

<b>III B.A., ENGLISH</b>	<b>TRANSLATION STUDIES</b>	<b>Code : EEN512B</b>
<b>SEMESTER- V</b>		<b>HRS / WK – 6</b>
<b>ELECTIVE-I</b>		<b>CREDITS: 5</b>

### OBJECTIVES

1. To familiarize the students with the history, theories, methods and practice of translation.
2. To enhance theories of language, meaning and of communication, to the extent necessary for a sound grasp of the subject, will also be included in the course work.
3. To assess the merits of translation and to explain failures in terms of translation theories.

### Course Outcomes:

**At the end of the Course the students exhibit**

**CO1:** The theoretic background of Translations .

**CO2:** Translation literature.

**CO3:** The transliteration and transcreation.

**CO4:** The importance problems of translation.

**CO5:** Translation as a literary activity.

SEMESTER – V		COURSE CODE: EEN512B		COURSE TITLE: TRANSLATION STUDIES								HOURS 6		CREDITS: 5
COURSE OUTCOMES		PROGRAMME OUTCOMES (PO)				PROGRAMME SPECIFIC OUTCOMES (PSO)								MEAN SCORE OF CO'S
Co	PO 1	PO 2	PO 3	PO 4	PO 5	PS O1	PS O2	PS O3	PS O4	PS O5	PS O6	PS O7	PS O8	Mean score
CO1	4	5	4	4	3	4	4	5	4	4	5	5	3	4.1
CO2	3	3	2	4	5	3	4	3	4	4	5	4	3	3.6
CO3	3	2	4	3	5	3	2	3	4	2	4	4	2	3.1
CO4	2	3	2	2	1	4	3	4	4	3	5	5	3	3.1
CO5	3	4	3	4	3	3	3	3	4	5	5	4	3	3.8
<b>Mean Overall Score</b>														<b>3.5</b>

Result : The score of this course 3.5 (**HIGH**)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcome and Programme Specific Outcome

**UNIT 1 [18 HRS]**

Translation fields and types – Definition of translation – Nida's and that of J.C.Catford – Phonological and Graphological translation – Transliteration – Grammatical and lexical translation.

**UNIT 2 [18 HRS]**

Theory of language – levels and level shifts – meaning and translation – transference and translation (J.C.Catford)

**UNIT 3 [18 HRS]**

Nida's theory of translation – Kernels and transforms – Equivalence in translation – correspondence – Nida's discussion of meaning – referential and emotive meanings

**UNIT 4 [18 HRS]**

Adjustments in translation – Theory of communication in its bearing on translation – Decoder's abilities – Fit, noise, communication load – lexical and structural – culture and translation – Ethno-linguistic model of translation

**UNIT 5 [18 HRS]**

Qualifications and motives of translator – language varieties – Limits of translatability – formal equivalence and poetry translation – Translation in Indian context – History of translation theory.

**Texts Books:**

1. Catford, J.C. (1965), *A Linguistic Theory of Translation*. London:OUP.
2. Bassnett, Susan (1980), *Translation studies*. London/NY: Routledge.
3. Bassnette, Susan &Lefevere, A. (eds.) (1990), *Translation, History and Culture*. London: Pinter.
4. J. Woodsworth, J. (eds) (1995), *Translators Through History*. Amsterdam, Philadelphia.
5. Halliday, M.A. K. and Hasan, R. (1976) *Cohesion in English*. London: Longman.
6. Katan, D. (2004) *Translating Cultures. An Introduction for Translators, Interpreters and Mediators*. Manchester: St. Jerome.

**Reference Books**

1. Nida, E.A. (1964) *Toward a Science of Translating*. Leiden: E.J. Brill.
2. Nida, E.A. and Taber, C.R. (1969), *The Theory and Practice of Translation*. Leiden: E.J. Brill.
3. Steiner, G. (1975), *After Babel*, Oxford: OUP.
4. Venuti, L. (2004), *The Translation Studies Reader*. London/NY: Routledge.

**Question Pattern**  
**TRANSLATION STUDIES**  
**Total Marks 75**

**Section-A**

- I. Short Questions 50 words  
[No Choice] 10x2=20

**Section-B**

- II. Paragraph Questions 150 words  
[Either or type] 5x5=25

**Section-C**

- III. Essay Questions 300 words  
[3 out of 5] 3x10=30

**NOTE: Questions must be taken covering all units in all the three sections**

<b>III B.A., ENGLISH</b>	<b>FILM STUDIES</b>	<b>EEN513B</b>
<b>SEMESTER- V</b>		<b>HRS / WK - 6</b>
<b>ELECTIVE-II</b>		<b>CREDITS: 5</b>

## Course Objectives

To trace the history and development of cinema

To comprehend the role and impact of cinema in society and vice-versa

To develop an understanding of the political, cultural and aesthetic nuances of film making

To critically analyse and appreciate cinema as an art

## Course Outcomes

CO 1: Observe with knowledge and reflect upon the articulation of a film's content, form and structure.

CO 2: Identify and define the formal and stylistic elements of film.

CO: 3 Gain a basic understanding of film theory and global film history, to be able to identify significant movements and articulate key concepts.

CO: 4 Demonstrate familiarity with diverse forms of the moving image, including, for example, the feature film, experimental and avant-garde cinema, video art and moving image installation, television and digital media.

CO: 5 Understand the relationship between film form and its historical and cultural contexts.

SEMESTER	COURSE CODE: EEN513B					TITLE OF THE PAPER: FILM STUDIES					HOURS:			CREDIT:
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)								MEAN SCORE OF CO'S
Co	Po1	Po2	Po3	Po4	Po5	PSo1	PSo2	PSo3	PSo4	PSo5	PSo6	PSo7	PSo8	Mean score
Co1	1	2	1	3	2	3	3	1	1	1	1	1	1	1.6
Co2	3	4	3	4	3	5	5	1	1	1	3	3	5	3.1
Co3	5	4	4	3	5	5	5	2	2	2	5	5	5	4.0
Co4	2	2	2	4	3	4	5	2	2	2	4	5	4	3.1
Co5	5	5	5	4	5	5	5	4	4	4	5	5	5	4.6
Mean Overall Score														3.28

Result : The score of this course 3.28 ( **HIGH**)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH association** with Programme Outcome and Programme Specific Outcome.

## UNIT 1

1. History of Film,
2. Mise-en-Scene
3. Cinema Verite
4. Beginnings of sound, Manifestations in cinema, Music in cinema
5. Beginnings of Cinema
6. Silent Era to Studio Era

## **UNIT 2**

1. German Expressionism - WW I and Expressionism
2. German Expressionism - Filmmakers, Impact and Legacy
3. Italian Neorealism - Realism, Advent of Neorealism
4. Italian Neorealism - Neorealist Cinema, Downfall and Legacy
5. French New Wave - Cahiers du Cinema, Philosophy
6. French New Wave - The French Masters, Cinematic Style and Legacy
7. Third Cinema - Socio-Political Milieu
8. Third Cinema - Ideology, Movement and Legacy

## **UNIT 3**

1. Auteur Theory - French Cinema, Cahiers du Cinema
2. Auteur Theory - Theory, Legacy, Auteurs
3. Feminist Film Theory - Visual Pleasure, Feminist Criticism
4. Feminist Film Theory - Freudian Psychosexual Theory, Critique
5. Queer Theory - Gender and Its Representation
6. Queer Theory - Film as Queer Text, Criticism
7. Postmodernism - Modernism and Cinema
8. Postmodernism - Postmodernist Cinema and Characteristics

## **UNIT 4**

1. Film Genre - Genre Theory
2. Film Genre - Western Film, Anthology Film
3. Film Genre - Film Noir, Gangster Film
4. Film Genre - Genre Blending, Genre Bending
5. Parsi Theatre, Silent Era
6. The Talkie, Studio System
7. Narrating the Nation in Cinema
8. Nation Building, Golden Age

## **UNIT 5**

1. Indian New Wave, Parallel Cinema
2. Parallel Cinema - Decline and Legacy
3. Liberalisation and Indian Cinema
4. Rise of Multiplex Cinema
5. Evolution of Censorship
6. Film Criticism, Cinephilia
7. Exhibition, Distribution and Production
8. Festivals, Events and Communities

## **Books**

1. Cinema Studies: The Key Concepts - *Susan Hayward*
2. German Expressionist Films (Pocket Essentials) - *Paul Cooke*
3. Italian Neorealism and Global Cinema - *Laura E. Ruberto, Kristi M. Wilson*
4. New Queer Cinema: The Director's Cut - *B. Ruby Rich*
5. Questions of Third Cinema - *Jim Pines*

6. The Film Book: A Complete Guide to the World of Film - *Ronald Bergan*
7. The History of Italian Cinema: A Guide to Italian Film from Its Origins to the Twenty-first Century - *Gian Piero Brunetta*

References

1. A History of the French New Wave Cinema - *Richard John Neupert*
2. Bollywood: A Guidebook to Popular Hindi Cinema - *Tejaswini Ganti*
3. Chick Flicks: Theories and Memories of the Feminist Film Movement - *B. Ruby Rich*
4. Film History: An Introduction - *Kristin Thompson, David Bordwell*
5. Film Studies: An Introduction - *Ed Sikov*
6. Grammar of the Shot - *Christopher J. Bowen*
7. Introduction to Film Studies - *Jill Nelmes*
8. Our Films, Their Films - *Satyajit Ray*
9. The 5 C's of Cinematography: Motion Picture Filming Techniques - *Joseph V. Mascelli*
10. The History of Film - *David Parkinson*

<b>YEAR – I</b>	<b>EFFECTIVE ENGLISH</b>	<b>CODE: EFE202</b>
<b>SEMESTER – II</b>		<b>Hours: 2</b>
<b>PART – IV SDC</b>		<b>Credit: 2</b>

**Objectives:**

1. To develop the communication ability of the students with focus on ‘Speaking Skill’ enabling them to use the language more effectively and confidently
2. To widen the student’s grasp of vocabulary and enable them to use these words in appropriate contexts.

## Course Outcomes:

**At the end of the course students exhibit**

**CO 1 Ability to start a conversation, interrogate, apologise or request appropriately in various context.**

**CO 2 Ability to read and interpret, converse over telephone.**

**CO 3 Display use of rich vocabulary and coin words.**

**CO 4 Develop oratorical skills**

**CO 5 Decode the patterns of language behavior to describe, narrate or summarise a paragraph.**

SEMESTER – II		COURSE CODE: EFE202				TITLE OF THE PAPER : Effective English						HOUR:2		CREDIT:2
COURSE OUTCOMES		PROGRAMME OUTCOMES(PO)				PROGRAMME SPECIFIC OUTCOMES (PSO)								MEAN SCORE OF CO'S
Co	Po1	Po2	Po3	Po4	Po5	PSo1	PSo2	PSo3	PSo4	PSo5	PSo6	PSo7	PSo8	Mean score
Co1	5	5	4	1	5	5	5	5	5	4	5	5	5	4.5
Co2	5	5	4	1	5	5	5	2	2	2	4	4	5	3.7
Co3	5	5	3	1	5	5	5	4	4	4	5	5	5	4.3
Co4	5	5	5	1	5	5	5	4	4	4	5	5	5	4.4
Co5	5	5	5	1	5	5	5	2	2	2	4	4	4	3.7
Mean Overall Score														4.1

Result: The score of this course 4.1 (**VERY HIGH**)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **VERY HIGH association** with Programme Outcome and Programme Specific Outcome

### Session 1 Breaking the Ice

- Greeting People
- Discussing Current Events
- Talking about different situations

### Session 2 Background

- Talking about events in life
- Discussing past events
- Talking about your education

### Session 3 Achievement

- Talking about experiences •

Discussing progress toward goals

- Talking about competition

#### **Session 4 News**

- Discussing news stories
- Discussing recent events
- Talking about memories

#### **Session 5 Virtual World**

- Discussing purposes and reasons
- Understanding common technology terms
- Writing emails

#### **Session 6 On the Move**

- Discussing travel procedures
- Talking about frequency
- Talking about travel problems

#### **Session 7 Planning**

- Making arrangements
- Describing arrangements
- Discussing plans and decisions

#### **Session 8 Predictions**

- Discussing predictions
- Describing the climate
- Discussing forecasts and scenarios

#### **Session 9 Buying and Selling**

- Talking about purchasing
- Discussing advantages and disadvantages
- Making comparisons

#### **Session 10 Leisure Time**

- Talking about leisure
- Discussing likes and dislikes
- Discussing feelings about experiences

#### **Session 11 Lifestyle**

- Talking about time
- Giving advice
- Discussing imaginary scenarios

#### **Session 12 Forces of Nature**

- Discussing the natural environment
- Describing systems
- Describing position and movement

#### **Session 13 On the Road**

- Talking about cars and roads



- Explaining rules
- Discussing rental arrangements

#### **Session 14 Fashion Sense**

- Describing things relatively
- Describing clothing
- Discussing safety issues

#### **Session 15 In Control**

- Talking about electrical devices
- Understanding technical instructions
- Describing controlling actions

Text book

[http://kb.naanmudhalvan.in/images/c/c7/Cambridge\\_Course\\_Details.pdf](http://kb.naanmudhalvan.in/images/c/c7/Cambridge_Course_Details.pdf)

References

[http://kb.naanmudhalvan.in/images/c/c7/Cambridge\\_Course\\_Details.pdf](http://kb.naanmudhalvan.in/images/c/c7/Cambridge_Course_Details.pdf)

<b>III YEAR</b>	<b>WORLD CLASSICS IN TRANSLATION</b>	<b>CODE: EN616A</b>
<b>SEMESTER VI</b>		<b>HOURS -5</b>
<b>CORE THEORY XIV</b>		<b>CREDITS -4</b>

**Objectives:**

1. To enrich the students in English Competitive Examinations.
2. To create an awareness on TOEFL/IELTS Examinations.
3. To stabilize the career with Computer-English skills.

**Course Outcomes:**

**At the end of the course students**

**CO1:** The theoretic background of Translations .

**CO2:** Translation literature.

**CO3:** The transliteration and transcreation.

**CO4:** The importance problems of translation.

**CO5:** Translation as a literary activity.

<b>SEMESTER VI</b>	<b>COURSE CODE: EN616A</b>					<b>COURSE TITLE: WORLD CLASSICS IN TRANSLATION</b>								<b>HOURS 5</b>	<b>CREDITS:4</b>
<b>COURSE OUTCOMES</b>	<b>PROGRAMME OUTCOMES(PO)</b>					<b>PROGRAMME SPECIFIC OUTCOMES (PSO)</b>								<b>MEAN SCORE OF CO'S</b>	
<b>CO</b>	<b>P O 1</b>	<b>P O 2</b>	<b>P O 3</b>	<b>P O 4</b>	<b>P O 5</b>	<b>PS O1</b>	<b>PS O2</b>	<b>PS O3</b>	<b>PS O4</b>	<b>PS O5</b>	<b>PS O6</b>	<b>PS O7</b>	<b>PS O8</b>	<b>Mean score</b>	
<b>CO1</b>	5	5	4	4	5	5	5	5	3	5	5	5	3	4.5	
<b>CO2</b>	5	5	4	5	5	5	5	5	4	5	5	5	5	4.7	
<b>CO3</b>	5	5	4	5	5	5	5	5	3	5	5	5	5	4.7	
<b>CO4</b>	5	5	5	5	5	5	5	5	3	5	5	5	3	4.7	
<b>CO5</b>	5	5	5	5	5	5	5	5	4	5	5	5	3	4.8	
<b>Mean Overall Score</b>														<b>4.7</b>	

Result : The score of this course 4.7

<b>Association</b>	<b>1%-20%</b>	<b>21%-40%</b>	<b>41%-60%</b>	<b>61%-80%</b>	<b>81%-100%</b>
<b>Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Interval</b>	<b>0&lt;=rating&lt;=1</b>	<b>1.1&lt;=rating&lt;=2</b>	<b>2.1&lt;=rating&lt;=3</b>	<b>3.1&lt;=rating&lt;=4</b>	<b>4.1&lt;=rating&lt;=5</b>
<b>Rating</b>	<b>Very Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>High</b>	<b>Very High</b>

The value shows that the course has **VERY HIGH association** with programme outcomes and programme specific outcomes

**Unit I: Poetry (Detailed) 15 HRS**

Pablo Neruda (1904-1973) : The Word  
Octavio Paz(1914-1998) : To the Painter Swaminathan  
Johann Wolfgang Von Goethe (1749-1832): The Dance of the Dead  
Tiruvalluvar : Tirukural-Knowing the Fitting Time (Trans G.U. Pope)

**Poetry (Non-detailed)**

Dante(1265-1321) : Divine Comedy (Canto I)  
Omar Khayyam(1048-1131) : The Rubaiyat (V Ed. 1-12 quatrains)  
Stephene Mallarme(1842-1898) : The Clown Chastised  
Rainer Maria Rilke(1875-1926) : A Sybil

**Unit II:Drama (Detailed) 15 HRS**

Ibsen(1828-1906) : A Doll's House

**Drama (Non-detailed)**

Kalidasa : Shakuntala

**Unit III: Prose (Detailed) 15 HRS**

Montaigne(1533-1592) : Of Idleness

**Prose (Non-detailed)**

Homer : The Iliad – Book I

**Unit IV: Novel 15 HRS**

Franz Kafka(1883-1924) : Metamorphosis  
Herman Hesse(1877-1962) : Siddhartha

**Unit V : Travelogue 15 HRS**

Bruce Chatwin(1940 - 1989) : The Songlines  
John Steinbeck(1902 - 1968) : Travels with Charlie : In Search of America

**Text Books**

Unit-I Poetry

1. Neruda, Pablo. The Essential Neruda: Selected Poems. New York: City Lights Publishers, 2004.
2. Paz, Octavia. The Collected Poems of Octavio Paz. New Delhi: New Directions, 1999
3. Dante, Alighieri. The Divine Comedy. London: Plain Label Books, 1955.
4. Khayyam, Omar. Rubaiyat of Omar Khayyam. New Delhi: Rupa Publications, 2000.
5. Thiruvalluvar. Tirukural. Trans. G.U. Pope. New Delhi: Vaigarai Publishing House, 1980.
6. Goethe: Poetical Works. Vol. 1. Boston: Francis A Niccolls and Company, 1902.

Unit-II Drama (Detailed)

7. Ibsen, Henrik. A Doll's House. New York: Plain Label Books, 1993.

Drama (Non-detailed)

8. Kalidas. Shakuntala. Kolkata: Hind Pocket Books, 1994.

Unit –III(Prose)

9. Homer. The Iliad. Oxford: Oxford Paperbacks, 1998.

Unit-IV (Novel)

10. Kafka, Franz. Metamorphosis. London: Aventura Press, 2008.
11. Hesse, Herman. Siddhartha. New Delhi: Rupa Publicatipons, 1998.

Unit – V (Travelogue)

12. Chatwin, Bruce. The Songlines. England:Vintage Arrow – Mass Market, 1998.
13. Steinbeck, John. Travels with Charlie : In Search of America. USA: Penguin Books, 1980.

## **EXTERNAL EXAMINATION**

### **QUESTION PATTERN**

#### **WORLD CLASSICS IN TRANSLATION - EN616A**

**Time: 3 Hours**

**Max. Marks: 75**

Section – A (No Choice)

10 X 2=20

Section – B (Either or Type)

5 X 5 = 25

Section – C (3 out of 5)

3 X 10 = 30

**TOTAL MARKS =75**

**FIRST YEAR - SEMESTER I**  
**ELECTIVE II -THEATRE ART**

Subject Code	Category	L	T	P	O	Credits	Inst. Hours	Marks		
								CIA	External	Total
EPEN15B	Elective	Y	Y	-	-	3	5	25	75	100
<b>Learning Objectives</b>										
LO1	To introduce the learners to the literary aspect of dramas.									
LO2	To familiarize Theatre as an art form.									
LO3	To introduce the concepts of directing and stage management.									
LO4	To inculcate in the students the role of Theatre in society.									
LO5	To familiarize the students with the components of acting.									
<b>Details</b>										
<b>UNIT I -</b> Drama as a performing art, Relation between drama and theatre, The role of theatre, The need for permanent theatres.										
<b>UNIT II -</b> Greek theatre, Shakespearean theatre, The Absurd theatre, The Epic theatre, The Multipurpose theatre, Designing for a particular theatre, The Eastern theatre - conventional and the non- conventional theatre, Folk theatre, urban theatre, third theatre, other theatres in vogue.										
<b>UNIT III -</b> Fundamentals of Play directing: Concept, technique, physical balance, demonstration. The director and the stage.										
<b>UNIT IV -</b> Components of acting: Gesture, voice, costume, make-up, mask and different styles in acting as an art form, violence in the theatre, need for censorship, managing time and space.										
<b>UNIT V –</b> Reactions against the Theatre of illusion, Expressionism and dramatic symbolism, Stage design in the modern world, Lighting in the modern world. Word versus spectacles.										
<b>Course Outcomes</b>										
<b>Course Outcomes</b>	On completion of this course, students will;									
<b>CO1</b>	Understand a broad range of theatrical disciplines and Experiences							PO2		
<b>CO2</b>	Identify the diversity of theatrical experiences and the role of theatre in society							PO1, PO2		
<b>CO3</b>	Discover the relationships among the various facets of Theatre							PO4, PO5		
<b>CO4</b>	Estimate drama as a performing art and the aspects of Stagecraft							PO4, PO5, PO6		
<b>CO5</b>	Gain exposure to diverse components of acting and techniques							PO8, PO9		

<b>Text Books (Latest Editions)</b>	
1.	Sangeetha, K and A.Selvalakshmi. An Introduction to Theatre Art. New Century Book House (P) Ltd.,2015.
<b>References Books (Latest editions, and the style as given below must be strictly adhered to)</b>	
1.	Balme, Christopher B. <i>The Cambridge Introduction to Theatre Studies</i> . Cambridge University Press,2008.
2.	Leach, Robert. <i>Theatre Studies: The Basics</i> . Routledge, 2013.
<b>Web sources</b>	
1.	<a href="https://paradisevalley.libguides.com/the111/theatre_history_websites">https://paradisevalley.libguides.com/the111/theatre_history_websites</a>
2.	<a href="https://www.britannica.com/place/England/Performing-arts">https://www.britannica.com/place/England/Performing-arts</a>
3.	<a href="https://www.worldhistory.org/Greek_Theatre/">https://www.worldhistory.org/Greek_Theatre/</a>
4.	<a href="https://archive.org/details/fundamentalsopl0000dean_y3x3">https://archive.org/details/fundamentalsopl0000dean_y3x3</a>
5.	<a href="http://scriptclickcreate.weebly.com/acting.html">http://scriptclickcreate.weebly.com/acting.html</a>
6.	<a href="https://www.britannica.com/art/theater-building/Production-aspects-of-Expressionist-theatre">https://www.britannica.com/art/theater-building/Production-aspects-of-Expressionist-theatre</a>

**Mapping with Programme Outcomes:**

	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>
<b>CO1</b>	3	3	3	3	3	2	3	3	3	2
<b>CO2</b>	2	3	3	2	2	3	2	2	2	3
<b>CO3</b>	3	3	2	2	3	2	3	2	3	2
<b>CO4</b>	3	3	3	3	2	3	3	2	3	2
<b>CO5</b>	3	2	3	3	3	3	2	2	2	3

**3 – Strong, 2 – Medium , 1 - Low**

**Mapping with Programme Specific Outcomes:**

<b>CO /PO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	3	3	3	3	3
<b>CO2</b>	3	3	3	3	3
<b>CO3</b>	3	3	3	3	3
<b>CO4</b>	3	3	3	3	3
<b>CO5</b>	3	3	3	3	3
<b>Weightage</b>	15	15	15	15	15
<b>Weighted percentage of Course Contribution to Pos</b>	3.0	3.0	3.0	3.0	3.0

**3 – Strong, 2 – Medium, 1 -**

**FIRST YEAR - SEMESTER I**

**PAPER II – COMMUNICATIVE ENGLISH I**

Subject Code	Category	L	T	P	S	Credits	Inst. Hours	Marks		
								CIA	External	Total
LE101B	Part II	Y	Y	-	-	3	6	25	75	100

**Learning Objectives**

<b>LO1</b>	To enable learners to acquire self awareness and positive thinking required in various life situations.
<b>LO2</b>	To help them acquire the attribute of empathy
<b>LO3</b>	To assist them in acquiring creative and critical thinking abilities
<b>LO4</b>	To enable them to learn the basic grammar
<b>LO5</b>	To assist them in developing LSRW skills

Unit No.	Unit Title & Text	No. of Periods for the Unit
<b>I</b>	<p><b>SELF-AWARENESS(WHO)&amp;POSITIVE THINKING(UNICEF)</b>  <b>Life Story</b>                      1.1 Chapter 1 from Malala Yousafzai, I am Malala                      1.2 An Autobiography or The Story of My Experiments with Truth (Chapters 1, 2 &amp; 3) M.K.Gandhi  <b>Poem</b>                      1.3 Where the Mind is Without Fear – Gitanjali 35 – Rabindranath Tagore                      1.4 Love Cycle – Chinua Achebe</p>	20
<b>II</b>	<p><b>EMPATHY</b>  <b>Poem</b>                      2.1 Nine Gold Medals – David Roth                      2.2 Alice Fell or poverty – William Wordsworth  <b>Short Story</b>                      2.3 The School for Sympathy – E.V. Lucas                      2.4 Barn Burning – William Faulkner</p>	20
<b>III</b>	<p><b>CRITICAL &amp; CREATIVE THINKING</b>  <b>Poem</b>                      3.1 The Things That Haven't Been Done Before – Edgar Guest                      3.2 Stopping by the Woods on a Snowy Evening –</p>	20



	Robert Frost <b>Readers Theatre</b> 3.3 The Magic Brocade – A Tale of China 3.4 Stories on Stage – Aaron Shepard (Three Sideway Stories from Wayside School” by Louis Sachar)	
<b>IV</b>	<b>Part of Speech</b> 4.1 Articles 4.2 Noun 4.3 Pronoun 4.4 Verb 4.5 Adverb 4.6 Adjective 4.7 Preposition	15
<b>V</b>	<b>Paragraph and Essay Writing</b> 5.1 Descriptive 5.2 Expository 5.3 Persuasive 5.4 Narrative <b>Reading Comprehension</b>	15

### Course Outcomes

Course Outcomes	On completion of this course,students will:	
<b>CO1</b>	Acquire self awareness and positive thinking required in various life situations	PO1,PO7
<b>CO2</b>	Acquire the attribute of empathy.	PO1,PO2,PO10
<b>CO3</b>	Acquire creative and critical thinking abilities.	PO4,PO6,PO9
<b>CO4</b>	Learn basic grammar	PO4,PO5,PO6
<b>CO5</b>	Development and integrate the use of four language skills i.e., listening, speaking, reading and writing.	PO3,PO8

### Text books (Latest Editions)

<b>1.</b>	Malala Yousafzai. I am Malala, Little, Brown and Company, 2013.
<b>2.</b>	M.K. Gandhi. An Autobiography or The Story of My Experiments with Truth (Chapter – I), Rupa Publications, 2011.
<b>3.</b>	Rabindranath Tagore. "Gitanjali 35" from Gitanjali (Song Offerings): A Collection of Prose Translations Made by the Author from the Original

	Bengali. MacMillan, 1913.
4.	N.Krishnasamy. Modern English: A Book of Grammar, Usage and Composition Macmillan, 1975.
5.	Aaron Shepard. Stories on Stage, ShepardPublications, 2017.
6.	J.C. Nesfield. English Grammar Composition and Usage, Macmillan, 2019.

#### Web Resources

1	MalalaYousafzai. I am Malala (Chapter 1) <a href="https://archive.org/details/i-am-malala">https://archive.org/details/i-am-malala</a>
2	M.K Gandhi. An Autobiography or The Story of My Experiments with Truth(Chapter-1)- Rupa Publication, 2011 <a href="https://www.indiastudychannel.com/resources/146521-Book-Review-An-Autobiography-or-The-story-of-my-experiments-with-Truth.aspx">https://www.indiastudychannel.com/resources/146521-Book-Review-An-Autobiography-or-The-story-of-my-experiments-with-Truth.aspx</a>
3	Rabindranath Tagore. "Gitanjali 35" from Gitanjali (Song Offerings) <a href="https://www.poetryfoundation.org/poems/45668/gitanjali-35">https://www.poetryfoundation.org/poems/45668/gitanjali-35</a>
4	Aaron Shepard.Stories on Stage, Shepard Publications, 2017 <a href="https://amzn.eu/d/9rVzINv">https://amzn.eu/d/9rVzINv</a>
5	J C Nesfield. Manual of English Grammar and Composition. <a href="https://archive.org/details/in.ernet.dli.2015.44179">https://archive.org/details/in.ernet.dli.2015.44179</a>

#### Mapping with Programme Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	3	3	3	3	3	2	3	2
CO2	2	3	3	3	2	3	3	2	2	2
CO3	3	3	3	2	3	3	3	2	3	2
CO4	3	3	3	3	3	3	3	2	2	2
CO5	3	2	3	3	3	3	3	2	2	3

#### Mapping with Programme Specific Outcomes:

CO /PO	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	3
CO2	3	3	3	3
CO3	3	3	3	3
CO4	3	3	3	3

<b>CO5</b>	3	3	3	3
<b>Weightage</b>	15	15	15	15
<b>Weighted percentage of Course Contribution to POS</b>	3.0	3.0	3.0	3.0

**3 – Strong, 2 – Medium, 1 – Low**

**PUBLIC SPEAKING SKILLS (SEC-I (NME))**

Subject Code	Category	L	T	P	S	Credits	Inst. Hours	Marks		
								CIA	External	Total
NEN101	SEC	Y	Y	-	-	2	2	25	75	100
<b>Learning Objectives</b>										
LO1	To help students understand the goals and benefits of public speaking									
LO2	To help them recognize communication apprehension and guide them on how to reduce it									
LO3	To familiarize them on how public speaking can be used to advocate or create change									
LO4	To enable learners recognize the social and historical contexts of speech, oratory, and rhetoric									
LO5	To help them think and speak imaginatively and critically									
<b>UNIT</b>	<b>Details</b>									
I	What is Public Speaking?									
II	Need for Public Speaking.									
III	Significance and essentials of public speaking skills									
IV	Techniques in acquiring the skill									
V	Speaking any common topic in front of the class									
<b>Course Outcomes</b>										
<b>Course Outcomes</b>	On completion of this course, students will;									
<b>CO1</b>	Demonstrate an understanding of the principles of public speaking							PO1		
<b>CO2</b>	Recognize barriers to public speaking and identify how to avoid them							PO1, PO2		
<b>CO3</b>	Understand how to give effective verbal and nonverbal feedback							PO4, PO6		
<b>CO4</b>	Learn about planning speech organization for the intended audience							PO4, PO5, PO6		

<b>CO5</b>	Practice effective group delivery and speech informal context.	PO3, PO8
Text Books (Latest Editions)		
1.	Beebe, S. A., & Beebe, S. J. (2006). Public Speaking: An audience -centred approach (6 <sup>th</sup> ed.). New York: Pearson	
2.	Fraleigh, D.M., & Tuman, J.S.(2009). Speak up! An illustrated guide to public speaking. New York: Bedford/St. Martins.	
<b>References Books</b> (Latest editions, and the style as given below must be strictly adhered to)		
1.	<i>Apple, W., Streeter, L.A. &amp; Krauss, R. M (1979). Effects of pitch and speech rate on personal attributions. Journal of Personality and Social Psychology, 37, 715-727.</i>	
<b>Web Resources</b>		
1.	<i>Learning Outcomes / Public Speaking (lumenlearning.com)</i> <i>lu03_public_speaking.pdf (indianhills.edu)</i>	

**Mapping with Programme Outcomes:**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
<b>CO 1</b>	3	3	3	3	3	3	3	2	3	2
<b>CO 2</b>	2	3	3	3	2	3	3	2	2	2
<b>CO 3</b>	3	3	3	2	3	3	3	2	3	2
<b>CO 4</b>	3	3	3	3	3	3	3	2	2	2
<b>CO 5</b>	3	2	3	3	3	3	3	2	2	3

**3 – Strong, 2 – Medium , 1 - Low**

**Mapping with Programme Specific Outcomes:**

<b>CO /PO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	3	3	3	3	3
<b>CO2</b>	3	3	3	3	3
<b>CO3</b>	3	3	3	2	3
<b>CO4</b>	3	3	3	3	3
<b>CO5</b>	3	3	3	3	3
<b>Weightage</b>	15	15	15	14	15
<b>Weighted percentage of Course Contribution to Pos</b>	3.0	3.0	3.0	2.8	3.0

**ENGLISH FOR CAREERS(SEC-II (FC))**

Subject Code	Category	L	T	P	S	Credits	Inst. Hours	Marks		
								CIA	External	Total
<b>FEN101</b>	Core	Y	Y	-	-	2	2	25	75	100
<b>Learning Objectives</b>										
LO1	To help students gain knowledge about the job search, application, and interview process									
LO2	Help them to explore their global career path, while building vocabulary and improving language skills to achieve professional goals.									
LO3	Help them with strategies for identifying the jobs that match their interests and skills									
LO4	Help them to understand the job-seekers language for meeting new people, making small talk, and describing									
LO5	To enable learners to describe themselves and their experiences in a résumé									
<b>UNIT</b>	<b>Details</b>									
I	Definition of English Language-Characteristic Features									
II	Purposes of English Language									
III	Major Roles played by English Language in Education and various career choices									
IV	English language as a identity to popular culture									
V	The major developments happening in the contemporary world by using English language.									
<b>Course Outcomes</b>										
<b>Course Outcomes</b>	On completion of this course, students will;									
<b>CO1</b>	Attain communicative competence so that they can use language accurately and appropriately							PO 1		
<b>CO2</b>	Understand the basic features of communication and aim at improving language skills							PO1, PO2		
<b>CO3</b>	Gain useful letter/report writing tools, tips and techniques to effectively apply the skills to their everyday workplace correspondence.							PO4, PO6		
<b>CO4</b>	Demonstrate the particulars of writing effective emails, whilst improving punctuation and grammar.							PO4, PO5, PO6		
<b>CO5</b>	Make sure that the style, content and message is concise, correct and appropriate.							PO3, PO8		

<b>Text Books (Latest Editions)</b>	
1.	The Waterfall. The English Writings of Rabindranath Tagore. Ed. Sisir Kumar Das. Vol. II. New Delhi: Sahitya Academy, 1966. 163-208. Print
2.	Geddes, Patrick. The Life and Work of J. C. Bose. London: Longman's Green and Co., 1920. Print
<b>References Books (Latest editions, and the style as given below must be strictly adhered to)</b>	
1.	Bose, D.M. "J.C. Bose." Dr. D. M. Bose Centenary Celebration Commemoration Volume 1885- 1985. Kolkata: Bose Institute, 1995. Print
<b>Web Resources</b>	
1.	<a href="https://www.researchgate.net/publication/344172814_English_For_Career_Development?enrichId=rgreq-f03b840d2a167e34689a3348ec32dc12-XXX&amp;enrichSource=Y292ZXJQYWdlOzMONDE3Mjg3NDtBUzo5MzY3MzNzZG3MTc0Mzc5NTdAMTU5OTY0MTYwMzU2NQ%3D%3D&amp;el=1_x_2&amp;_esc=publicationCoverPdf">https://www.researchgate.net/publication/344172814_English_For_Career_Development?enrichId=rgreq-f03b840d2a167e34689a3348ec32dc12-XXX&amp;enrichSource=Y292ZXJQYWdlOzMONDE3Mjg3NDtBUzo5MzY3MzNzZG3MTc0Mzc5NTdAMTU5OTY0MTYwMzU2NQ%3D%3D&amp;el=1_x_2&amp;_esc=publicationCoverPdf</a>

**Mapping with Programme Outcome:**

	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PO 6</b>	<b>PO 7</b>	<b>PO 8</b>	<b>PO 9</b>	<b>PO10</b>
<b>CO 1</b>	3	3	3	3	3	3	3	2	3	2
<b>CO 2</b>	2	3	3	3	2	3	3	2	2	2
<b>CO 3</b>	3	3	3	2	3	3	3	2	3	2
<b>CO 4</b>	3	3	3	3	3	3	3	2	2	2
<b>CO 5</b>	3	2	3	3	3	3	3	2	2	3

**3 – Strong, 2 – Medium , 1 - Low**

<b>CO /PO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	3	3	3	3	3
<b>CO2</b>	3	3	3	2	3
<b>CO3</b>	3	3	3	3	3
<b>CO4</b>	3	3	3	3	3
<b>CO5</b>	3	3	3	3	3
<b>Weightage</b>	15	15	15	14	15



<b>Weighted percentage of Course Contribution to Pos</b>	3.0	3.0	3.0	2.8	3.0
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**Mapping with Programme Specific Outcomes:**

<b>I M.A., English</b>	<b>20<sup>TH</sup> CENTURY BRITISH LITERATURE</b>	<b>Code : PEN21A</b>
<b>Semester – II</b>		<b>Hours : 6</b>
<b>Core –IV</b>		<b>CREDITS :5</b>

**Objectives :**

1. To train the students acquire an understanding of the war years and their literary consequences.
2. To expose the students to the authors of the 20<sup>th</sup> Century.
3. To analytically appreciate various emerging literary trends and forms.
4. To introduce futuristic thinking through classic science fiction novels.

**Course Outcomes:**

**At the end of the course students**

CO1: Recognise the changes in culture and technology in society.

CO2: Group the growth and changes in Language.

CO3: Familiarity towards the great writers and their writings.

CO4: To differentiate conventional genres and emerging trends.

CO5: Ability to know the 20<sup>th</sup> century life style.

Semester	Course Code : PEN21A					COURSE TITLE: 20 <sup>th</sup> Century British literature								Hours:	Credits:
I														6	5
Co	Programme out come					Programme Specific out come								Mean score	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8		
CO1	5	5	4	5	5	5	4	4	5	3	5	5	5	4.6	
CO2	5	5	5	5	4	5	5	4	5	5	5	3	5	4.6	
CO3	4	5	5	5	5	5	4	5	5	5	3	5	3	4.5	
CO4	5	5	5	4	4	5	5	5	3	5	4	4	5	4.5	
CO5	5	5	5	5	5	5	5	5	3	3	5	4	4	4.5	
Mean overall score													4.5		

Result : The score of this course 4.5 (**VERY HIGH**)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

The Value shows that course has **VERY HIGH** association with programme outcomes and programme specific outcomes.

**UNIT I - POETRY (DETAILED) 20 Hrs**

1. W.B. Yeats : Second Coming
2. Rupert Brooke: Helen and Menelaus
3. T.S. Eliot :Preludes

**UNIT II - POETRY (NON-DETAILED) 15 Hrs**

1. Seamus Heaney : The Tollund Man
2. Philip Larkin : Water
3. Dylan Thomas: Do Not Go Gentle Into That Good Night

**UNIT III – PROSE (DETAILED) 20 Hrs**

1. George Orwell : Politics and the English Language
2. Bertrand Russell : In Praise of Idleness
3. C.P. Snow : Two Cultures

**UNIT IV – DRAMA (DETAILED) 20 Hrs**

Samuel Beckett : Waiting for Godot

**UNIT V – FICTION 15 Hrs**

1. Virginia Woolf : Mrs. Dalloway
2. D.H. Lawrence : Sons and Lovers
3. Arthur C. Clarke : Childhood's End

**Text Books:**

1. Lawrence, D. H. **Sons and Lovers**. Delhi: A. I. T. B. S. Publishers and Distributors, 1994.
2. Woolf, Virginia. **Mrs. Dalloway**. Great Britain: OUP, 1992.
3. Mundera, S. C. W. B. Yeats: **Selected Poems**. Bareilly: Prakash Book Depot, 2004.
4. Green, David ed; 'The Winged Word': **An Anthology of Poems of Degree course**. Trinity press. New Delhi, 2016.

5. Russell, Bertrand 'In Praise of Idleness and Other Essays'. Routledge Pub. England, 1935.

**Reference Books / Websites:**

1. Press, John. **A Map of Modern Verse**. London: OUP, 1969.
2. Rosenthal, M.L. **The New Poets**. London: OUP, 1967.
3. [https:// reason and meaning. Com .Bertrand...](https://reasonandmeaning.com/Bertrand...)
4. [http:// www. allinfo. Org.uk/ levelup/ water.htm](http://www.allinfo.Org.uk/levelup/water.htm).

**QUESTION PAPER PATTERN**

**20<sup>TH</sup> CENTURY BRITISH LITERATURE**

**Code: PEN21A**

**Section-A Total Marks-75**

- I. Short Questions (covering all units) / Annotations (only from detailed texts)  
(50 words) (No Choice) – 10x2=20

**Section-B**

- II. Paragraph Questions (150 words) – 5x5 =25  
(Either Or)

**Section-C**

- III. Essay Questions (300 words) – 3x10=30  
(3 out of 5)

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Total - 75 Marks

**Note: Questions must be taken covering all units in all the three sections**

<b>I M.A., English</b>	<b>AMERICAN LITERATURE</b>	<b>Code : PEN22B</b>
<b>Semester – II</b>		<b>Hours : 6</b>
<b>Core –VI</b>		<b>CREDITS : 5</b>

**Objectives:**

1. To explore the uniqueness of American literature at an advanced level.
2. To introduce the students to American Science Fiction through representative texts.

**Course Outcomes:**

**At the end of the course students**

CO1: Display a working knowledge of American literary genre.

CO2: distinct the characteristic features of the novels.

CO3: Critically analyze poems from their structure and meaning, using correct terminology which will enhance their communicative and vocabulary abilities.

CO4: Effectively communicate ideas related to the Dramas during class and group activities.

CO5: Analyse simple literary discipline of sustained reading of prose work to develop their moral values.

SEMESTER -II	COURSE CODE: PEN22B	COURSE TITLE: AMERICAN LITERATURE								HOURS:6	CREDITS: 5			
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)								MEAN SCORE OF CO'S
Co	PO 1	PO 2	PO 3	PO 4	PO 5	PS O1	PS O2	PS O3	PS O4	PS O5	PS O6	PS O7	PS O8	Mean score
CO1	5	4	4	5	5	4	5	5	5	4	5	4	5	4.6
CO2	5	4	3	5	4	3	4	5	4	5	5	3	5	4.2
CO3	5	5	4	3	3	4	3	4	5	5	5	3	5	4.1
CO4	5	5	4	4	5	5	5	3	5	4	4	5	5	4.3
CO5	5	5	4	5	3	4	4	5	4	5	5	4	5	4.0
Mean Overall Score														4.24

Result : The score of this course 4.24 (**VERY HIGH**)

<b>Association</b>	<b>1%-20%</b>	<b>21%-40%</b>	<b>41%-60%</b>	<b>61%-80%</b>	<b>81%-100%</b>
<b>Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Interval</b>	<b>0&lt;=rating&lt;=1</b>	<b>1.1&lt;=rating&lt;=2</b>	<b>2.1&lt;=rating&lt;=3</b>	<b>3.1&lt;=rating&lt;=4</b>	<b>4.1&lt;=rating&lt;=5</b>
<b>Rating</b>	<b>Very Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>High</b>	<b>Very High</b>

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome

### Unit - I

#### POETRY – (DETAILED)

20Hrs

- Edgar Allan Poe : Israfel
- Walt Whitman : A Passage to India
- Emily Dickinson : 1. Success is counted the Sweetest  
2. A Narrow Fellow in the Grass
- Robert Frost : Mending Wall
- Wallace Stevens : 1. Anecdote of the Jar  
2. Peter Quince at the Clavier

### Unit - II

#### POETRY – (NON DETAILED)

15 Hrs

- E.E.Cummings : Among Crumbling People

2. Ezra Pound : The Ballad of the Goodly Fere
3. Sylvia Plath : Mirror

### **Unit - III**

#### **DRAMA – (DETAILED)**

**20 Hrs**

1. Arthur Miller : Death of a Salesman

#### **DRAMA – (NON DETAILED)**

1. Marsha Norman : Night Mother

### **Unit - IV**

#### **PROSE – (DETAILED)**

**15 Hrs**

1. R.W. Emerson : Self Reliance
2. H.D. Thoreau : Civil Disobedience

### **Unit - V**

#### **FICTION**

**20 Hrs**

1. John Steinbeck : The Grapes of Wrath
2. Norman Mailer : An American Dream
3. William Faulkner : The Sound and the Fury

#### **Text Books:**

1. Miller, Arthur. **Death of a Salesman**. New Delhi: Arnold Associates, 1996. Print.
2. Marudanayagam, P. **American Literature- An Anthology of Prose**. Chennai: Emerald Publishers, 1987, Print.
3. Gray, Richard. **American Poetry of the Twentieth Century**. London: Cambridge University Press, 1976. Print.
4. Steinbeck, John. **The Grapes of Wrath**. United States: The Viking Press, 1939. Print.
5. Mailer, Norman. **An American Dream**. United states: Dial Prss, 1965. Print.
6. **An Anthology of American Literature** Ed. By William J. Fisher, Eurasia Publishers, New Delhi.
7. **American Literature of 1860 – An Anthology Egbert**. S. Oliver., Eurasia Publishers, New Delhi.

#### **Reference Books:**

1. Gray, Richard. **American Poetry of the Twentieth Century**. London: CUP, 1976.
2. Mundra, S.C. **A Reader's Guide to American Literature**. Bareilly: Prakash Book Depot, 2004.
3. Tilak, Raghukul. **History of American Literature**. Bareilly: Prakash Book Depot, 2003.

## **QUESTION PAPER PATTERN**

### **AMERICAN LITERATURE**

**Code : PEN22B**

**Section-A Total Marks-75**

- I. Short Questions (covering all units) / Annotations (only from detailed texts)  
(50 words) (No Choice) – 10x2=20

**Section-B**

- II. Paragraph Questions (150 words) – 5x5 =25  
(Either Or)

**Section-C**

- III. Essay Questions (300 words) – 3x10=30  
(3 out of 5)

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Total - 75 Marks

**Note: Questions must be taken covering all units in all the three sections**

<b>I M.A., English</b>	<b>MODERN LINGUISTICS AND STYLISTICS</b>	<b>Code : PEN23A</b>
<b>Semester – II</b>		<b>Hours : 6</b>
<b>Core –VII</b>		<b>CREDITS :5</b>

**OBJECTIVES:**

To expose the students to:

1. To help students recognize and analyse the various patterns of language.
2. The intricacies of articulating English sounds, enabling them to speak better.
3. Levels of linguistic analysis, preparing them to become effective teachers.

**Course Outcomes:**

**At the end of the Course the students should be able to exhibit**

CO1 Displays the English sounds in differ from language.

CO2 Acquire the professional skills of pronouncing.

CO3 Understand the style of language to communicate

CO4 Pronounce the word properly and correctly

CO5 Attain the structure, theories, and applied linguistics

SEME STER II	COURSE CODE: PEN23A					COURSE TITLE: Modern Linguistics and Stylistics								HOUR S:6	CRED ITS:5
COUR SE OUTC OMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)								MEAN SCOR E OF CO'S	
CO	P O 1	P O 2	P O 3	P O 4	P O 5	PS O1	PS O2	PS O3	PS O4	PS O5	PS O6	PS O7	PS O8	Mean score	
CO1	5	5	4	4	5	5	5	5	4	5	5	5	3	4.6	
CO2	5	5	4	5	5	5	5	5	3	5	5	5	5	4.7	
CO3	5	5	4	5	5	5	5	5	3	5	5	5	5	4.7	
CO4	5	5	5	5	5	5	5	5	3	5	5	5	3	4.7	
CO5	5	5	5	5	5	5	5	5	3	5	5	5	3	4.7	
Mean Overall Score														4.6	

Result : The score of this course 4.6 (**VERY HIGH**)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High



The value shows that the course has **VERY HIGH** association with programme outcomes and programme specific outcomes

## LINGUISTICS

### UNIT – I

#### The Study of Language

20 Hrs

1. Some Fundamental Concepts
2. Modern Linguistics: A Historical Survey
3. Phonetics Transcription (Paragraph or Conversation(5 exchanges))

### UNIT – II

#### The Study of Grammar

20

#### Hrs

1. Morphology
2. Word Formation
3. Basic Sentence Patterns
4. Structural Grammar
5. TG Grammar

### UNIT – III

#### The Study of Semantics

20

#### Hrs

1. Theories of Semantics
2. Semantics, Pragmatics and Discourse
3. Principles of Lexicography

## STYLISTICS

### UNIT – IV

15 Hrs

1. The Problem of Style. Rhetoric – Various definitions.
2. What is Stylistics? History – Varieties

### UNIT – V

15 Hrs

1. Stylistics of Prose and Practical Analysis.
2. Stylistics of Poetry and Practical Analysis.
3. Stylistics of Drama and Practical Analysis.

#### Text Books:

1. Syal, Pushpinder and D.v Jindal. An Introduction of Linguistics, 2<sup>ND</sup> Ed. PHI Learning Privaled Limited, Delhi,2007.
2. Misra, Sarathi Partha.An Introduction of Stylistics Theory and Practice, Orient Black Swan,Hyderabad India,2009.

**Reference Books:**

1. A Textbook of English Phonetics for Indian Students. Mac Millan Publishers India Limited, 2009.

**QUESTION PAPER PATTERN**

**MODERN LINGUISTICS AND STYLISTICS**

**Code: PEN23A**

**Section-A Total Marks-75**

- I. Short Questions (covering all units) (50 words) (No Choice)  
– 10x2=20

**Section-B**

- II. Paragraph Questions (150 words)  
(Either Or) – 5x5 =25

**Section-C**

- III. Essay Questions (300 words)  
(3 out of 5) – 3x10=30

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Total - 75 Marks

**Note: Questions must be taken covering both Modern Linguistics and Stylistics in all sections.**

**Questions must be taken covering all units in all the three sections.**

<b>I M.A., English</b>	<b>LITERARY CRITICISM</b>	<b>Code : PEN24B</b>
<b>Semester – II</b>		<b>Hours : 6</b>
<b>Core –VIII</b>		<b>CREDITS :5</b>

**Objectives:**

1. To introduce the students to one of the most enabling forms of literary study.
2. To expose the students to the complexities of literary theory and criticism, which is the most essential aspects of literary appreciation.
3. To train the students understand and analyse literary writings.

**Course Outcomes**

**At the end of the course students should exhibit**

- CO1 The use of a major online research tool in the field of literature.  
CO2 The text in the study of literary theory and culture.  
CO3 Variety of literary critical tools in research.  
CO4 Historical contexts for the development of contemporary theory and criticism.  
CO5 An appreciation of the relevance and value of theoretical models in literary study

<b>SEMESTE R -II</b>	<b>COURSE CODE: PEN24B</b>	<b>COURSE TITLE: Literary Criticism</b>	<b>HOURS:6</b>	<b>CREDI TS: 5</b>
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COURSE OUTCOMES		PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)								MEAN SCORE OF CO'S
Co	PO 1	PO 2	PO 3	PO 4	PO 5	PS O1	PS O2	PS O3	PS O4	PS O5	PS O6	PS O7	PS O8	Mean score	
CO1	5	5	5	3	5	5	5	3	2	2	4	5	5	4.1	
CO2	5	5	4	5	5	5	5	1	1	1	4	4	4	3.7	
CO3	5	5	4	3	5	5	5	2	2	2	4	4	5	3.9	
CO4	5	5	4	5	5	5	5	2	2	2	3	3	4	3.8	
CO5	4	4	4	4	2	4	5	1	1	1	2	3	3	2.9	
Mean Overall Score														3.68	

Result : The score of this course 3.68 (**HIGH**)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcome and Programme Specific Outcome

**UNIT – I** **18 Hrs**

1. Aristotle :Poetics , Chapters Taught (Chapter I & II)
2. Philip Sydney :An Apology for Poetry

**UNIT – II** **18 Hrs**

1. John Dryden : An Essay of Dramatic Poesy
2. Samuel Johnson : Preface to Shakespeare

**UNIT – III** **18 Hrs**

- William Wordsworth : Preface to Lyrical Ballads

**UNIT – IV** **18 Hrs**

1. Henry James : Art of Fiction
2. T.S. Eliot : Tradition and Individual Talent

**UNIT – V** **18 Hrs**

1. E.M. Forster : Aspects of Novel
2. Northrope Frye : Archetypes of Literature

**Text Books:**

1. Sethuraman. V. S. and Ramaswamy. The English Critical Tradition. Madras: Macmillan, 1977.
2. Forster E.M, Aspects of Novel, Penguin Classics, 2005.
3. James Henry, Besant Walter. The Art of Fiction, Scholar's Choice Edition, 2015.

**Reference Books:**

1. Barry, Peter. **Beginning Theory**. Manchester: Manchester University Press, 2002.
2. Frye, Northrop. **Anatomy of Criticism**. Princeton: Princeton University Press, 1957.
3. Murfin, Ross, and Supriya M. Ray. **The Bedford Glossary of Critical and Literary Terms**. New York: Macmillan Press Ltd., 1997.
4. D.J.Wright and Chickera De Ernst. English Critical Texts, Oxford University Press, 1962.

## QUESTION PAPER PATTERN

### LITERARY CRITICISM

Code : PEN24B

#### Section-A Total Marks-75

- I. Short Questions (covering all units) (50 words) (No Choice)  
– 10x2=20

#### Section-B

- II. Paragraph Questions (150 words) – 5x5 =25  
(Either Or)

#### Section-C

- III. Essay Questions (300 words) – 3x10=30  
(3 out of 5)

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Total - 75 Marks

**Note: Questions must be taken covering all units in all the three sections**

## CORE I – INTRODUCTION TO LITERATURE

Subject Code	Category	L	T	PS	Credits	Inst. Hours	Marks		
							CIA	External	Total
EN101B	Core	Y	Y	-	5	5	25	75	100
<b>Learning Objectives</b>									
LO1	To introduce the different forms of literature								
LO2	To provide learners with the background knowledge of literature								
LO3	To enable learners to understand the different genres of writing								
LO4	To examine the various themes and methodologies present in literature								
LO5	To create the ability of critically examining a text								
<b>UNIT</b>	<b>Details</b>								
I	Introduction: Poetry-Different forms of poetry- Sonnet, Ode, Elegy, Lyric Ballad. Prose-Short Story, Novella, Novel. Drama- Comedy, Tragedy, Tragi-Comedy.								
II	Michael Drayton - The Parting. William Shakespeare - Sonnet 18, Sonnet 116. John Milton - When I Consider How My Light is Spent, William Wordsworth - Daffodils. John Keats - Ode to Nightingale. Thomas Gray - Elegy Written in a Country Churchyard. Robert Frost - Mending Wall Theodore Roethke – The Meadow Mouse								
III	J.M. Barrie - The Admirable Crichton. Lady Gregory - The Rising of the Moon.								
IV	Manohar Malgonkar - Spy in Amber. Don Quixote - Tilting at the Windmills. A Dill Pickle, The Escape from Katherine Mansfield - Bliss and other stories.								
V	Saki - The Open Window Robert Lynd – Sweet Jerome K. Jerome - excerpt from - Three Men in a Boat – (Packing Episode)								

<b>Course Outcomes</b>		
<b>Course Outcomes</b>	On completion of this course, students will;	
<b>CO1</b>	Appreciate and analyse and the basic elements of poetry, including meter, rhyme, and theme.	PO1
<b>CO2</b>	Gain knowledge of the elements of fiction including narrative structure, character analysis and comparison between different but related texts.	PO1, PO2
<b>CO3</b>	Explore the dramatic storytelling including play structure, monologues, dialogue, and scene setting.	PO4, PO6
<b>CO4</b>	Use library resources to research and develop arguments about literary works.	PO4, PO5, PO6
<b>CO5</b>	Work skillfully within a team, respect coworkers, delegate work and contribute to a group project.	PO3, PO8

<b>Text Books (Latest Editions)</b>	
1.	Backpack Literature: An Introduction to Fiction, Poetry, Drama, and Writing- X. J. Kennedy, by Pearson, 2016.
2.	<b>Portable Literature: Reading, Reacting, Writing - 9th edition</b> –Laurie Kirschner, by Cengage Learning, 2016
<b>References Books (Latest editions, and the style as given below must be strictly adhered to)</b>	
1.	Henny Herawati et al., Introduction to Literature, Sanata Dharma University Press, October 2021.
2.	Michael Meyer, D. Quentin Miller, The Compact Bedford Introduction to Literature with 2021 MLA Update, Bedford/St. Martin's, August 2021.
3.	Janice Campbell., Introduction to Literature: Excellence in Literature English 1, 4th Ed, Everyday Education, LLC, January 2021.



4.	Subhendu Mund., The Making of Indian English Literature, Taylor & Francis Ltd., 2021.
5.	Adamson H. D. Linguistics and English Literature: An Introduction, Cambridge University Press, 2019.
6.	Felicity Titjen et al.(ed), Teaching English Language and Literature, Taylor& Francis,2020

Web Resources	
1.	<i>ASIATIC: IITUM Journal of English Language &amp; Literature</i>
2.	<i>The English Historical Review (EHR)</i>

**Mapping with Programme Outcomes:**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10
<b>CO1</b>	3	3	3	3	3	3	3	2	3	2
<b>CO2</b>	2	3	3	3	2	3	3	2	2	2
<b>CO3</b>	3	3	3	2	3	3	3	2	3	2
<b>CO4</b>	3	3	3	3	3	3	3	2	2	2
<b>CO5</b>	3	2	3	3	3	3	3	2	2	3

**3 – Strong, 2 – Medium , 1 - Low**

**Mapping with Programme Specific Outcomes:**

CO /PO	PSO1	PSO2	PSO3	PSO4	PSO5
<b>CO1</b>	3	3	3	3	3
<b>CO2</b>	3	3	3	3	3
<b>CO3</b>	3	3	3	3	3
<b>CO4</b>	3	3	3	3	3
<b>CO5</b>	3	3	3	3	3
<b>Weightage</b>	15	15	15	15	15
<b>Weighted percentage of Course Contribution to Pos</b>	3.0	3.0	3.0	3.0	3.0

**FIRST YEAR - SEMESTER I**  
**CORE II - INDIAN WRITING IN ENGLISH**

Subject Code	Category	L	T	P	S	Credits	Inst. Hours	Marks		
								CIA	External	Total
EN102B	Core	Y	Y	-	-	5	5	25	75	100

**Learning Objectives**

LO1	To familiarize the students with the emergence and growth of Indian Writing in English in the context of colonial experience.
LO2	To help in understanding issues concerning Indian Writing in English such as the representation of culture, identity, history, constructions of nation, (post)national and gender politics, cross-cultural transformations.
LO3	To enable learners to appreciate Nation-Nationalism; Counter Discourse; Subalternity; Identity Movements.
LO4	To closely examine the various themes and methodologies existing in Contemporary Indian Writing in English.
LO5	To help learners apply the ideas encapsulated in Indian Aesthetics to literary texts

UNIT	Details
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I	<i>Winning of Friends (Panchathantra)</i> – Vishnu Sharma (there are four stories to choose from) <i>Hachiko</i> – Pamela S. Turner <i>Brother's Day</i> from Folktales – A.K. Ramanujan <i>Handful of Nuts, Night Train at Deoli</i> from Ruskin Bond <i>Sparrows</i> - K.A. Abbas
II	Rabindranath Tagore - Khabhuliwala. India through a Traveller's Eye excerpt from My Several Worlds - Pearl S Buck. <i>The School Among the Pines, Boy Scouts Forever, Uncle Ken's Rumble in the Jungle</i> from School Days - Ruskin Bond Inspection Episode-Examination- from Part I Childhood – M.K. Gandhi - Autobiography, Science, Humanities and Religion
III	Poetry- The Lotus - Toru Dutt The Tiger and the Deer - Sri Aurobindo
IV	Sarojini Naidu- The Village Song A.K. Ramanujam - Still Another View of Grace Shiv K Kumar - Indian Women Mirza Ghalib - It is not Love, it is Madness

V	Rabindranath Tagore - Mukhthadhara. The Window, Sentry's Lantern - Five Plays - Harindranath Chattopadhyay Nalini: A Comedy in Three Acts – Three Plays - Nissim Ezeikel Joginder Paul - Sleepwalkers. RK Narayan – Swami & Friends.	
<b>Course Outcomes</b>		
<b>Course Outcomes</b>	On completion of this course, students will;	
<b>CO1</b>	Appreciate the historical trajectory of various genres of Indian Writing in English from colonial times to till the present	PO1
<b>CO2</b>	Analyze Indian literary texts written in English in terms of colonialism, postcolonialism, regionalism, and nationalism	PO1, PO2
<b>CO3</b>	Understand the role of English as a medium for political awakening and the use of English in India for creative writing	PO4, PO6
<b>CO4</b>	Analyze how the sociological, historical, cultural and political context impacted the texts selected for study	PO4, PO5, PO6
<b>CO5</b>	Evaluate critically the contributions of major Indian English poets and dramatists	PO3, PO8
<b>Text Books (Latest Editions)</b>		
1.	Rexroth, Kenneth. <i>The New British Poets: An Anthology</i> . Granger Books, 1976.	
<b>References Books (Latest editions, and the style as given below must be strictly adhered to)</b>		
1.	Bacon, Francis, and Michel Leiris. <i>Francis Bacon</i> . Ediciones Poligrafa, 2008.	
2.	MARLOWE, Christopher. <i>Dr. Faustus</i> . BOOK ON DEMAND LTD, 2021.	
3.	Shelley, Mary Wollstonecraft. <i>Frankenstein</i> . CreateSpace, 2015.	
4.	Swift, Jonathan, et al. <i>Gulliver's Travels</i> . Oxford University Press, 2019.	
<b>Web Resources</b>		

1.	<p><b>Ranger, Paul. "Technical Features." She Stoops to Conquer by Oliver Goldsmith, 1985, pp. 51–68., <a href="https://doi.org/10.1007/978-1-349-07664-2_5">https://doi.org/10.1007/978-1-349-07664-2_5</a>.</b></p>
2.	<p>Dickens, Charles. "Fifty-Two." <i>A Tale of Two Cities</i>, 2008, <a href="https://doi.org/10.1093/owc/9780199536238.003.0047">https://doi.org/10.1093/owc/9780199536238.003.0047</a>.</p>

Mapping with Programme Outcomes:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10
<b>CO1</b>	3	3	3	3	3	3	3	2	3	2
<b>CO2</b>	2	3	3	3	2	3	3	2	2	2
<b>CO3</b>	3	3	3	2	3	3	3	2	3	2
<b>CO4</b>	3	3	3	3	3	3	3	2	2	2
<b>CO5</b>	3	2	3	3	3	3	3	2	2	3

CO /PO	PSO1	PSO2	PSO3	PSO4	PSO5
<b>CO1</b>	3	3	3	3	3
<b>CO2</b>	3	3	3	2	3
<b>CO3</b>	3	3	3	3	3
<b>CO4</b>	3	3	3	3	3
<b>CO5</b>	3	3	3	3	3
<b>Weightage</b>	15	15	15	14	15

<b>Weighted percentage of Course Contribution to Pos</b>	3.0	3.0	3.0	2.8	3.0
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3 –

**Strong, 2 – Medium , 1 - Low**

**Mapping with Programme Specific Outcomes:**

**FIRST YEAR - SEMESTER I**  
**SOCIAL HISTORY OF ENGLAND(ELECTIVE - I)**

Subject Code	Category	L	T	P	S	Credits	Inst. Hours	Marks		
								CIA	External	Total
EEN101B	Elective	Y	Y	-	-	3	4	25	75	100
<b>Learning Objectives</b>										
LO1	To provide students with a comprehensive idea about the development of English literature and language over the ages									
LO2	To help student trace the trajectory of the growth of English literature from the period of its inception, dating back to the seventh century, to the present era									
LO3	To help them develop an understanding of the structural development of the English language									
LO4	To inform them about the various external linguistic influences that have contributed to the making of the language									
LO5	To create the ability of critically examining a text									
<b>UNIT</b>	<b>Details</b>									
I	The Renaissance and its Impact on England, The Reformation - causes and effects.									
II	The Commonwealth of Nations, The Restoration, The Puritan Revolution, Coffee-houses and their Social Relevance									
III	Impact of the Industrial, Agrarian and the French Revolutions on the English society, Humanitarian Movements in England, The Victorian Age.									
IV	The Reform Bills and the Spread of Education- Social impact of the two World Wars, the Labour Movement, the Welfare State									
V	The Cold War (1945-1991)- The Falkland War (1981)-The Gulf War (1991), Trade Unionism in England.									
<b>Course Outcomes</b>										
<b>Course Outcomes</b>	On completion of this course, students will;									
CO1	Gain extensive insight into the history of English literature, while laying special emphasis on various literary movements, genres and writers that are held to be the representatives of their times.								PO1	
CO2	Evaluate the way socio-cultural and historical phenomena influence the literary production of a particular period								PO1, PO2	
CO3	Familiarize themselves with the socio-cultural ambience and the discursive frameworks of various ages								PO4, PO6	

<b>CO4</b>	Develop a nuanced appreciation of the literary stalwarts of those times.	PO4, PO5, PO6
<b>CO5</b>	Gain in-depth understanding on the growth of the English language under the influence of various other languages including Latin and French, besides being mentored in the structural nitty-gritties of the language.	PO3, PO8
<b>Text Books (Latest Editions)</b>		
1.	Ed. Keith Wrightson, A Social History of England, 1500- 1750, 2018, Norton Press.	
2.	<b>Ed. Julia Crick, Elisabeth Van Houts, A social History of England, 900-1200, 2012, Cambridge University Press.</b>	
<b>References Books (Latest editions, and the style as given below must be strictly adhered to)</b>		
1.	Ed. Rosemary Horrox, A social History of England, 1200-1500, June 2012, Cambridge University Press	
<b>Web Resources</b>		
1.	<i>A social history of England : Briggs, Asa, 1921- : Free Download, Borrow, and Streaming : Internet Archive</i>	

**Mapping with Programme  
Outcomes:**

	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PO 6</b>	<b>PO 7</b>	<b>PO 8</b>	<b>PO 9</b>	<b>PO10</b>
<b>CO 1</b>	3	3	3	3	3	3	3	2	3	2
<b>CO 2</b>	2	3	3	3	2	3	3	2	2	2
<b>CO 3</b>	3	3	3	2	3	3	3	2	3	2
<b>CO 4</b>	3	3	3	3	3	3	3	2	2	2



<b>CO 5</b>	3	2	3	3	3	3	3	2	2	3
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**3 – Strong, 2 – Medium , 1 - Low**

**Mapping with Programme Specific Outcomes:**

<b>CO /PO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	3	3	3	3	3
<b>CO2</b>	3	3	3	2	3
<b>CO3</b>	3	3	3	3	3
<b>CO4</b>	3	3	3	3	3
<b>CO5</b>	3	3	3	3	3
<b>Weightage</b>	15	15	15	14	15
<b>Weighted percentage of Course Contribution to Pos</b>	3.0	3.0	3.0	2.8	3.0

<b>II YEAR</b>	<b>COMMUNICATIVE ENGLISH – III</b> <b>B.A., / B.Sc., / B. Com / BBM / BCA/ BBA</b>	<b>LE303A /</b> <b>LEC303A</b>
<b>SEMESTER – III</b>		<b>HRS / WK</b> <b>4</b>
<b>PART – II</b> <b>ENGLISH</b>		<b>CREDITS:</b> <b>3</b>

**OBJECTIVES:**

To make students acquire Basic English Skills-Listening, Speaking, Reading and Writing.  
To help them taste the essence of language through literature.  
To imbibe values for life, touching upon the different facts of literature.

**Course Outcomes:**

**At the end of the course students**

**CO1:** Narrate simple experiences in a coherent manner.

**CO2:** Make use of the students to practice the situational basic skills.

**CO3:** Different types of warm up activities to discuss the theme of the play.

**CO4:** Comprehend the local and global issues and using writing skills.

**CO5:** Enhance their language Skills and understanding the social and literatures.

SEMESTER III	COURSE CODE: LE303A / LEC303A					COURSE TITLE: COMMUNICATIVE ENGLISH III								HOURS 4	CREDITS:3
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)								MEAN SCORE OF CO'S	
CO	P O 1	P O 2	P O 3	P O 4	P O 5	PS O1	PS O2	PS O3	PS O4	PS O5	PS O6	PS O7	PS O8	Mean score	
CO1	5	5	4	4	5	5	5	5	3	5	5	5	3	4.5	
CO2	5	5	4	5	5	5	5	5	4	5	5	5	5	4.8	
CO3	5	5	4	5	5	5	5	5	3	5	5	5	5	4.6	
CO4	5	5	5	5	5	5	5	5	3	5	5	5	3	4.6	
CO5	5	5	5	5	5	5	5	5	4	5	5	5	3	4.7	
<b>Mean Overall Score</b>														<b>4.6</b>	

Result : The score of this course 4.6 (**HIGH**)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcome and Programme Specific Outcome

**UNIT- I** **12 HRS**

**I Listening:** Narration

**II Speaking:**

Welcoming the gathering

Introducing a Guest to the audience

Thanking the gathering and organizers of an event

**III Reading:** One – Act Play :*Refund* – Fritz Kazinthy

**IV Writing:** Publicity Literature

**UNIT–II** **12 HRS**

**I. Listening :**

1. *Quit India* – Mahatma Gandhi (Prose)

2. *Tryst with Destiny* – Jawaharlal Nehru (Speech: Prose)

**II. Speaking :** Giving One’s Opinion on current National/ Social issues

**III. Reading :** One – Act Play : *The Bear* – Anton Chekhov

**IV. Writing:** Spotting Errors

**UNIT – III** **12 HRS**

**I. Listening**

1. *Gettysburg Address*- Abraham Lincoln (Speech: Prose)

2. *I have a Dream* – Martin Luther King (Speech: Prose)

**II. Speaking**

1. Preparing news items of local events and speaking about them

2. Sample News Item (Event)

**III. Reading :** One – Act Play : *The Hour of Truth* – Percival Wilde

**IV. Writing :** E- Mail Writing

**UNIT – IV** **12 HRS**

**I. Listening**

1. *Inaugural Address*– John. F. Kennedy (Speech: Prose)

2. *Prepared to Die*- Nelson Mandela (Speech: Prose)

**II. Speaking :** Presentation Skills

**III. Reading :** Autobiography : *Sorrows of Childhood* – Charles Chaplin

**IV. Writing:** Resume Writing

**UNIT – V** **12 HRS**

**I. Listening:** Some useful Expressions

**II. Speaking :** Speech Writing

**III. Reading :**

1. Biography: *Marie Curie*- Colin Mitchell

2. Biography: *Sarojini Naidu* – PadminiSengupta

**IV. Writing:** Minutes Writing

### COMMUNICATIVE ENGLISH – III

#### Text Books:

1. Aravindakshan.T.Y, Vijayalakshmi.C.K, Sailaja. A.K. *Reading Literature In English*. Delhi: Cambridge University Press India. Pvt., Ltd., 2013. Print.
2. Board of Editors. *Break Through*. Hyderabad: Orient Blackswan, 2015. Print.
3. Board of Editors. *Lime Light-3 (An Anthology of Prose, Biography, Poetry, Short Story and One Act Plays)*. Chennai: SSK Publishers& Distributers, 2015. Print.
4. Board of Editors. *Lime Light-1 (An Anthology of Prose, Biography, Poetry, Short Story and One Act Plays)*. Chennai: SSK Publishers& Distributers, 2015. Print.
5. Board of Editors. *Sunlight-IV (An Anthology of Prose, Poetry, Drama and Language Items)*. Chennai: Anuradha Publications, 2016. Print.
6. Natarajan, Lalitha&Natesan, Sasikala. *English for Excellence (Short Stories and Biographies)* Chennai: Anuradha Publications, 2014. Print.
7. Pillai, Radhakrishna. G &Rajeevan.K. *Spoken English for You*. Chennai: Emerald Publishes,1994. Print.
8. Pillai, Radhakrishna.G, BaskaranNair.P&Rajeevan.k. *Written English for You*. Madras: Emerald Publishers, 1994. Print.
9. Seshadri,K.G, ed. *A Prism of Plays*. Chennai: Anuradha Publications, 2014. Print.
10. Sukumaran, Beena. *Indian Voices (An Anthology of Indian Writings In English)*. India: Cambridge University Press.Pvt Ltd, 2015.Print.
11. Suresh Kumar. E. *Essential English*. Hyderabad: Orient Blackswan, 2015. Print.

#### REFERENCE BOOKS:

1. Bhatnagar.R.P, Bhargava, Rajul, ed. *English for Competitive Examinations*. Chennai: Macmillan,2002. Print.
2. Dr. Ramesh, Sree. *English Through Literature (A Textbook For Undergraduate Studies)*. Hyderabad: Orient Blackswan, Pvt Ltd, 2013. Print.
3. Narayanaswami.V.R. *Strengthen Your Writing*. Kolkata: Orient Blackswan Pvt., Ltd., 2013. Print.

### COMMUNICATIVE ENGLISH –III

#### SEMESTER-III

#### QUESTION PATTERN

**Time: 3hrs**

**Marks: 75**

**Section-A (NO CHOICE) (10x2=20)**

#### Short Answers:

Questions covering all the units except Publicity Literature, E Mail Writing, Resume Writing and Minutes Writing.

**Section-B (EITHER OR TYPE) (5x5=25)**

#### Paragraph Questions

5 Either Or type Questions Covering Listening, Speaking and Writing Skills of all the 5 Units Except *Tryst with Destiny, I have a Dream and Prepared to Die*

**Section-C (3 Out Of 5) (3x10=30)**

#### Essay Questions

5 Essay questions (300 words) covering the Reading Skill of all the 5 Units and only the following contents of Listening Skills *Tryst with Destiny, I have a Dream and Prepared to Die* .

<b>II YEAR</b>	<b>COMMUNICATIVE ENGLISH – IV</b> <b>B.A., / B.Sc., / B. Com / BBM / BCA/ BBA</b>	<b>LE404A / LEC404A</b>
<b>SEMESTER – IV</b>		<b>HRS / WK 4</b>
<b>PART – II</b> <b>ENGLISH</b>		<b>CREDITS: 3</b>

### OBJECTIVES:

1. To make students acquire Basic English Skills-Listening, Speaking, Reading and Writing.
2. To help them taste the essence of language through literature.
3. To imbibe values for life, touching upon the different facets of literature.

### Course Outcomes:

**At the end of the course students**

**CO1:** Introduce themselves to the others through the soft skills.

**CO2:** Comprehend the local and global issues through the play and novel.

**CO3:** Different types of warm up activities can be used to group discussion.

**CO4:** Use the interactive skills through the negations and homophones in the text.

**CO5:** Enhance their language Skills and understanding the social background.

SEMESTER IV	COURSE CODE: LE404A / LEC404A					COURSE TITLE: COMMUNICATIVE ENGLISH IV								HOURS 4	CREDITS:3
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)								MEAN SCORE OF CO'S	
CO	P O 1	P O 2	P O 3	P O 4	P O 5	PS O1	PS O2	PS O3	PS O4	PS O5	PS O6	PS O7	PS O8	Mean score	
CO1	5	5	4	5	5	5	5	5	5	4	5	5	5	4.8	
CO2	5	5	3	5	5	3	4	5	4	5	5	3	5	4.3	
CO3	5	5	4	3	3	4	3	4	4	4	2	3	5	3.7	
CO4	5	5	4	4	4	5	5	3	5	4	4	5	5	4.4	
CO5	5	5	4	5	3	5	5	5	4	5	4	4	5	4.5	
<b>Mean Overall Score</b>														<b>4.3</b>	

Result : The score of this course 4.3 (**VERY HIGH**)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome

**UNIT- I** **12 HRS**

**I. Listening:** Mock – Interviews / Actual Interviews

**II. Speaking:**

1. Facing an Interview
2. Tele – Interviews

**III. Reading**

1. Drama: *Julius Caesar - Funeral Oration* – William Shakespeare
2. Novel: *The Count of Monte Cristo* - Alexandre Dumas  
(Chapter 01-10)

**IV. Writing:** Description

**UNIT- II** **12 HRS**

**I. Listening:** Words often confused

**II. Speaking:** Seminar Skills

**III. Reading**

1. Drama: *Macbeth- He Kills Sleep* -William Shakespeare
2. Novel: *The Count of Monte Cristo* - Alexandre Dumas (Chapter 11-20)

**IV. Writing :** Idioms and Phrases

**UNIT- III** **12 HRS**

**I. Listening:**

1. Homonyms and Similar words
2. Tele – conferences

**II. Speaking:**

1. Handling Customers or Clients
2. Receiving Visitors

**III. Reading**

1. Drama: *Henry IV (Part I) -Play out a Play* –William Shakespeare
2. Novel: *The Count of Monte Cristo* - Alexandre Dumas  
(Chapter 21-30)

**IV. Writing:** The use of Graphics

**UNIT- IV** **12 HRS**

**I. Listening:** Homophones

**II. Speaking:**

1. Booking Hotel Accommodation
2. Making Small Talk and Telling Stories

**III. Reading**

1. Drama: *Patterns of Love – As You Like It* - William Shakespeare
2. Novel: *The Count of Monte Cristo* - Alexandre Dumas  
(Chapter 31-40)

**IV. Writing** Negotiations

**UNIT- V** **12 HRS**

**I. Listening:** Group Discussions

**II. Speaking:**

1. Making Appointments
2. Cancelling and Rescheduling Appointments

**III. Reading**

1. Drama: *Hamlet – Churchyard* - William Shakespeare
2. Novel: *The Count of Monte Cristo* - Alexandre Dumas  
(Chapter 41-49)

**IV. Writing :** Writing Review of Books

## COMMUNICATIVE ENGLISH- IV

### Text Books:

1. Board of Editors. *Selected Scenes from Shakespeare's Plays*. Chennai: Emerald Publishers, 2000. Print.
2. Dumas, Alexandre. *The Count of Monte Cristo*. Madras: Macmillan, 1994. Print.
3. Green, David, ed. *Contemporary English Grammar Structures and Composition*. Delhi: Macmillan publishers, 1971. Print.
4. Narayanaswami, V.R. *Strengthen Your Writing*. Kolkata: Orient Blackswan Pvt., Ltd., 2003. Print.
5. Pillai, Radhakrishna. G & Rajeevan. K. *Spoken English for You*. Madras: Emerald, 1994. Print.
6. Sharma. R.C, Krishna Mohan. 4<sup>th</sup>ed. *Business Correspondence and Report Writing (A Practical Approach to Business & Technical Communication)*. New Delhi: Tata MC Graw Hill Education Pvt Ltd., 2010. Print.
7. Suresh Kumar. E. *Essential English*. Hyderabad: Orient Blackswan, 2015. Print.
8. Tina Thoburn, Ruta Schlatterbeck and Ann Terry. *Macmillan English*. New York: Macmillan Publishing Co., 1982. Print.

### REFERENCE BOOKS:

1. Bhatnagar, R.P. *English for Competitive Examinations*. Chennai: Macmillan, 2002. Print.
2. Rao, Prasana, N.D.V, *A Guide to Better English for Students (The Students Handbook)*. New Delhi: S. Chand & Company Ltd., 1992. Print.
3. Samson. T, Rajeevan, Geetha & Consultant Editor. *Interface 2*. Chennai: Cambridge University Press. 2008. Print.

**COMMUNICATIVE ENGLISH –IV  
II YEAR B.A., /B.Sc.,**

**SEMESTER-IV**

**QUESTION PATTERN**

**Time: 3hrs**

**Marks: 75**

**Section-A (No choice)**

**(10x2=20)**

**Objective and Short Answers:**

Questions covering all units except speaking skills.

**Section-B (Either or Type)**

**(5X5=25)**

Questions only from speaking skills.

Interviews, Seminar Skills, Handling Customers, Receiving Visitors, Booking

Hotels, Making and Cancelling Appointments.

Graphics or Descriptions.

Negotiations or Group Discussions.

Writing Review of Books.

**Section-C (3 Out of 5)**

**(3x10=30)**

**Essays 300 words**

5 Essay type questions from the Reading Skill of all the 5 Units.

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**FIRST YEAR - SEMESTER I**  
**CORE -1 ENGLISH POETRY – From Chaucer to 20th Century**

Subject Code	Category	L	T	P	O	Credits	Inst. Hours	Marks		
								CIA	External	Total
PEN11A	Core	Y	Y	-	-	5	7	25	75	100
<b>Learning Objectives</b>										
LO1	To familiarize students with English Poetry starting from Medieval England to 17 <sup>th</sup> Century.									
LO2	To focus on the evolution of Poetic forms such as Sonnet, Ballad, Lyric, Satire, Epic etc.									
LO3	Good comprehension of History of English literature is enhanced									
LO4	Differentiation among the various stages of English could be identified by students.									
LO5	Critical approaches towards various literary forms can be learnt.									
<b>Details</b>										
<b>UNIT I</b> Middle English Poetry-Chaucer: "The General Prologue": Pardoner, The Nun Additional Reading: Doctor, Friar <b>UNIT II</b> Elizabethan Poetry- Spenser: "Prothalamion" Donne: "A Valediction: Forbidding Mourning", "The Canonization" <b>UNIT III</b> Seventeenth Century Poetry- John Milton "Paradise Lost" Book IX Marvell: "To His Coy Mistress"										
<b>UNIT IV</b> Eighteenth Century Poetry – John Dryden "Absalom and Achitophel " Lines 150 - 476 Thomas Gray- "Elegy", "The Bard", "On a Favourite Cat Drowned in a tub of Goldfishes" Wordsworth: Tintern Abbey Coleridge- "Frost at Midnight" Robert Burns - "Holy Willie's Prayer", "Auld Lang Syne"										
<b>UNIT V</b> Modern Poetry -Rupert Brooke: "The Soldier" W.B. Yeats : Sailing to Byzantium W. H. Auden: "Elegy on the Death of W. B. Yeats" & "Musee des Beaux Arts" Dylan Thomas: "Do Not Go Gentle Into That Good Night" Stephen Spender "The Express" Philip Larkin: "Whitsun Weddings" Ted Hughes: "Hawk Roosting" Seamus Heaney: "Digging" Carol Ann Duffy: "Prayer" Eavan Boland: "The Pomegranate"										

<b>Course Outcomes</b>		<b>Programme Outcomes</b>
C O	On completion of this course, students will	
1	Gain ideas about the old English writing style.	PO1, PO2
2	Acquire knowledge about various forms of poetry during different centuries.	PO5,PO6
3	Evaluate various poets as representatives of their periods	PO7
4	Trace the evolution of various literary movements	PO8
5	Justify British Poetry as an aesthetic record of the societies concerned	PO9, PO10
<b>Text Book</b>		
1	1973, The Oxford Anthology of English Literature Vol. I. The Middle Ages Through the 18th century. OUP, London	
2	Standard editions of texts	
<b>Reference Books</b>		
1.	T.S. Eliot, 1932, "The Metaphysical Poets" from Selected Essay; Faber and Faber limited, London.	
2.	H.S. Bennett, 1970, Chaucer and the Fifteenth Century, Clarendon Press, London.	
3.	Malcolm Bradbury and David Palmer, ed., 1970 Metaphysical Poetry, Stratford - upon – Avon Studies Vol. II, Edward Arnold, London.	
4.	William R. Keats, ed., 1971, Seventeenth Century English Poetry: Modern Essays in Criticism, Oxford University Press, London.	
5.	A.G. George, 1971, Studies in Poetry, Heinemann Education Books Ltd., London.	
6	David Daiches, 1981, A Critical History of English Literature Vols. I &II., Secker &Warburg, London.	
7	Thomas N. Corns, ed., 1993, The Cambridge Companion to English Poetry: Donne toMarvell, Cambridge University Press, Cambridge.	
<b>Web Resources</b>		
1.	<a href="http://www.english/.org.uk/chaucer/htm">http://www.english/.org.uk/chaucer/htm</a>	
2.	<a href="https://www.britannica.com/topic/The-Canonization">https://www.britannica.com/topic/The-Canonization</a>	
3.	<a href="https://www.worldhistory.org/Elizabethan_Theatre/https://www.britannica.com/to pic/Paradise-Lost-epic-poem-by-Milton">https://www.worldhistory.org/Elizabethan_Theatre/https://www.britannica.com/to pic/Paradise-Lost-epic-poem-by-Milton</a>	
4.	<a href="https://www.britannica.com/topic/Absalom-and-Achitophel">https://www.britannica.com/topic/Absalom-and-Achitophel</a>	
5.	<a href="https://www.cs.mcgill.ca/~rwest/wikispeedia/wpcd/wp/m/Modernist_poetry_in_English.htm">https://www.cs.mcgill.ca/~rwest/wikispeedia/wpcd/wp/m/Modernist_poetry_in_English.htm</a>	

### Mapping with Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	3	3	3	2	3	3	3	2
CO2	2	3	3	2	2	3	2	2	2	3
CO3	3	3	2	2	3	2	3	2	3	2
CO4	3	3	3	3	2	3	3	2	3	2
CO5	3	2	3	3	3	3	2	2	2	3

3 – Strong, 2 – Medium, 1 - Low

### Mapping with Programme Specific Outcomes

CO /PO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	3
CO2	3	3	3	2	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	14	15
Weighted percentage of Course Contribution to Pos	3.0	3.0	3.0	2.8	3.0

3 – Strong, 2 – Medium, 1 - Low

**FIRST YEAR - SEMESTER I**  
**CORE- II - ENGLISH DRAMA**

Subject Code	Category	L	T	P	O	Credits	Inst. Hours	Marks		
								CIA	External	Total
PEN12B	Core	Y	Y	-	-	5	7	25	75	100
<b>Learning Objectives</b>										
LO1	To acquaint the students with the origin of drama in Britain									
LO2	Different stages of British Drama and its evolution in the context of theatre can be understood by the students.									
LO3	Socio-cultural scenario can be well comprehended through a study of representative texts from the Elizabethan age to 20th century.									
LO4	Evaluating different forms of drama from the historical background could be learnt.									
LO5	Understanding dramatic techniques implied by the pioneers of English drama									
<b>Details</b>										
<b>UNIT I Beginnings of Drama</b> - Miracle and Morality Plays -Everyman The Senecan and Revenge Tragedy Thomas Kyd - The Spanish Tragedy										
<b>UNIT II Elizabethan Theatre</b> - Theatres, Theatre groups, Audience, Actors and Conventions. Tragedy and Comedy, Christopher Marlowe: The Jew of Malta Ben Jonson : Volpone										
<b>UNIT III Jacobean Drama</b> -John Webster: The White Devil										
<b>UNIT IV Restoration</b> -William Congreve- The Way of the World Irish Dramatic Movement J.M Synge- Riders to the Sea.										
<b>UNIT V Epic Theatre</b> Bertolt Brecht -Mother Courage and her Children Comedy of Menace, Harold Pinter :Birthday Party, Post-Modern Drama, Samuel Beckett :Waiting for Godot										

Course Outcomes		Programme Outcomes
CO	On completion of this course, students will	
1	Appraise various aspects of drama and theatre	PO1, PO2
2	Identify drama and performance as a cultural process and an artistic discourse	PO3, PO5
3	Evaluate plot structure, characterization and dialogue	PO4
4	Interpret drama texts as aesthetic records of their times viz., Elizabethan, Restoration, Victorian and Early Modern ages	PO6, PO7, PO8
5	Examine the sequential course dealing with Modern and Postmodern British Drama	PO9, PO10
<b>Text Book</b>		
1	Bradbrook, M.C., 1955, The Growth and Structure and Elizabethan Comedy, London.	
2	Tillyard E.M.W., 1958, The Nature of Comedy & Shakespeare, London.	
<b>Reference Books</b>		
1.	Una Ellis-Fermor, 1965, The Jacobean Drama: An Interpretation, Methuen & Co., London.	
2.	Allardyce Nicoll, 1973, British Drama, Harrap, London.	
3.	Bradbrook, M.C., 1979, Themes and Conventions of Elizabethan Tragedy, Vikas Publishing House Pvt., Ltd., (6 <sup>th</sup> ed) New Delhi.	

4.	Michael Hathaway, 1982, Elizabethan Popular Theatre: Plays in Performance, Routledge, London.
5.	Kinney, Arthur.F., 2004, A Companion to Renaissance Drama, Oxford: Blackwell Publishing. <a href="https://www.britannica.com/art/epic-theatre">https://www.britannica.com/art/epic-theatre</a>
<b>Web Resources</b>	
1.	<a href="http://www.questia.com">http://www.questia.com</a> (online library for research)
2.	<a href="http://www.clt.astate.edu/wmarey/asste%">http://www.clt.astate.edu/wmarey/asste%</a>
3.	<a href="https://nosweatshakespeare.com/resources/era/jacobean-drama-theatre/">https://nosweatshakespeare.com/resources/era/jacobean-drama-theatre/</a>
4.	<a href="https://www.britannica.com/art/English-literature/The-Restoration">https://www.britannica.com/art/English-literature/The-Restoration</a>
5.	<a href="https://www.britannica.com/art/epic-theatre">https://www.britannica.com/art/epic-theatre</a>

#### Mapping with Programme Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	3	3	3	3	3	2	3	2
CO2	2	3	3	3	2	3	3	2	2	2
CO3	3	3	3	2	3	3	3	2	3	2
CO4	3	3	3	3	3	3	3	2	2	2
CO5	3	2	3	3	3	3	3	2	2	3

3 – Strong, 2 – Medium, 1 - Low

#### Mapping with Programme Specific outcomes:

CO /PO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of Course	3.0	3.0	3.0	3.0	3.0

<b>Contribution to Pos</b>					
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**3 – Strong, 2 – Medium, 1 - Low**

**FIRST YEAR - SEMESTER I  
CORE III - ENGLISH FICTION**

Subject Code	Category	L	T	P	O	Credits	Inst. Hours	Marks		
								CIA	External	Total
PEN13B	Core	Y	Y	-	-	4	6	25	75	100
<b>Learning Objectives</b>										
LO1	To familiarize the students with the origin and development of the British Novel up to the 20 <sup>th</sup> Century.									
LO2	The contents of the paper are meant to throw light on various concepts and theories of the novel.									
LO3	To understand the social background base on the prescribed novels.									
LO4	Identifying and differentiating various forms of novels.									
LO5	Trying hands in writing a piece of work on their own.									
<b>Details</b>										
<p><b>UNIT I –</b>            Novel as a Form, Concepts and Theories about the Novel;            Poetics of the Novel – definition, types, narrative modes: omniscient narration.  <b>Allegorical Novel and Satire</b> John Bunyan The Pilgrim’s Progress Jonathan Swift            Gulliver’s Travels</p> <p><b>UNIT II –</b>            The New World Novel - Daniel Defoe: Robinson Crusoe            Picaresque Novel - Laurence Stern: Tristram Shandy.</p> <p><b>UNIT III –</b>            Middle Class Novel of Manners :Jane Austen - Emma            Detective Novel : Agatha Christie – The Secret Adversary.</p> <p><b>UNIT IV - Women’s Issues :</b> Charlotte Bronte - Jane Eyre            Social Novel : Thomas Hardy – Tess of the D’ Urbevilles</p> <p><b>UNIT V - Liberal Humanism, Individual Environment and Class Issues,</b>            D.H.Lawrence :The Rainbow, James Joyce: Portrait of the Artist as a Young Man</p>										



<b>Course Outcomes</b>		
<b>Course Outcomes</b>	On completion of this course, students will;	
<b>CO1</b>	Gain wide knowledge about different types of novels.	PO1, PO10
<b>CO2</b>	Learn the art of writing different forms of novel with the learned notions.	PO2, PO3
<b>CO3</b>	Explore Social, domestic and gothic novels.	PO4, PO5
<b>CO4</b>	Assess philosophical and political underpinnings of Victorian morality, anti Victorian realities and the aesthetic movement.	PO4, PO5, PO6
<b>CO5</b>	Infer themes relating to the turn of the century events through close reading of text.	PO7, PO8, PO10
<b>Text Books (Latest Editions)</b>		
1.	Wayne C. Booth, 1961, The Rhetoric of Fiction, Chicago University Press, London.	
2.	F.R. Leavis, 1973, The Great Tradition, Chatto&Windus, London.	
<b>References Books</b>		
<b>(Latest editions, and the style as given below must be strictly adhered to)</b>		
1.	Ian Watt, 1974, Rise of the English Novel, Chatto&Windus, London.	
2.	Frederick R Karl, 1977, Reader's Guide to the Development of the English Novel till the 18 <sup>th</sup> Century, The Camelot Press Ltd. Southampton.	
3.	Arnold Kettle, 1967, An Introduction to English Novel Vol. II, Universal BookStall, New Delhi.	
4.	Raymond Williams, 1973, The English Novel: From Dickens to Lawrence, Chatto&Windus, London.	
5.	Ian Milligan, 1983, The Novel in English: An Introduction, Macmillan, HongKong.	
<b>Web Resources</b>		
1.	<a href="http://en.wikipedia.org/wiki/English_literature">http://en.wikipedia.org/wiki/English_literature</a>	
2.	<a href="http://en.wikipedia.org/wiki/novel">http://en.wikipedia.org/wiki/novel</a>	
3.	<a href="https://www.britannica.com/art/picaresque-novel">https://www.britannica.com/art/picaresque-novel</a>	
4.	<a href="https://www.britannica.com/art/novel-of-manners">https://www.britannica.com/art/novel-of-manners</a>	
5.	<a href="https://www.britannica.com/topic/Jane-Eyre-novel-by-Bronte">https://www.britannica.com/topic/Jane-Eyre-novel-by-Bronte</a>	

**Mapping with Programme Outcomes:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	3	3	3	3	3	2	3	2
CO2	2	3	3	3	2	3	3	2	2	2
CO3	3	3	3	2	3	3	3	2	3	2
CO4	3	3	3	3	3	3	3	2	2	2
CO5	3	2	3	3	3	3	3	2	2	3

**3 – Strong, 2 – Medium , 1 - Low**

**Mapping with Specific Outcomes:**

CO /PO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
<b>Weightage</b>	15	15	15	15	15
<b>Weighted percentage of Course Contribution to Pos</b>	3.0	3.0	3.0	3.0	3.0

**3 – Strong, 2 – Medium, 1 - Low**

**FIRST YEAR - SEMESTER I**  
**ELECTIVE- I INDIAN WRITING IN ENGLISH**

Subject Code	Category	L	T	P	O	Credits	Inst. Hours	Marks		
								CIA	External	Total
EPEN14A	Elective	Y	Y	-	-	3	5	25	75	100
<b>Learning Objectives</b>										
LO1	Enabling the students to understand the evolution of Indian Writing in English.									
LO2	To enable the learners to get exposed to the historical movements of the Indiansubcontinent.									
LO3	Comprehending different genres through the representation of different texts.									
LO4	To inculcate in the students the cultural significance of Indian English literature.									
LO5	To comprehend Indian writing in English with its dual focus on the influence of classical Indian tradition and the impact of the West.									
<b>Details</b>										
<p><b>UNIT I - Poetry</b> Aurobindo: Tiger and the Deer, Rose of God Toru Dutt: The Lotus, The Casuarina Tree Sarojini Naidu: Palanquin Bearers, Coromandel Fishers A.K. Ramanujam – River. Rabindranath Tagore – Gitanjali (1 – 6)</p> <p><b>UNIT II - Poetry</b> Kamala Das: Looking Glass, An Introduction. Parthasarathy: A River Once, Under Another Sky Nissim Ezekiel: The Worm, Enterprise.</p> <p><b>UNIT III - Drama</b> Girish Karnad: Nagamandala. Asif Currimbhoy: Inquilab.</p> <p><b>UNIT IV - Prose</b> Rabindranath Tagore: My School Dr. S. Radhakrishnan : Emerging World Society, Dr. A. P. J. Abdul Kalam : Orientation (Wings of Fire). Niraj C. Chaudhuri – A Passage to England</p> <p><b>UNIT V - Fiction</b> Anita Desai: Where Shall we go this Summer? Shashi Deshpande: Roots and Shadows</p>										

<b>Course Outcomes</b>		
<b>Course Outcomes</b>	On completion of this course, students will;	
<b>CO1</b>	Understand the themes of Indian Writing in English	PO1
<b>CO2</b>	Identify the major trends in Indian Writing in English	PO1, PO2
<b>CO3</b>	Examine the background and settings of the prescribed texts	PO4, PO6
<b>CO4</b>	Evaluate the cultural significance of Indian English Literature	PO4, PO5, PO6
<b>CO5</b>	Gain exposure to diverse culture and literature and further enlighten them about socio-cultural scenario in the contemporary era.	PO3, PO8
<b>Text Books (Latest Editions)</b>		
1.	Ramamurti, K.S. (ed.). Twenty five Indian Poets in English Macmillan. 1995.	
<b>References Books</b> (Latest editions, and the style as given below must be strictly adhered to)		
1.	K.R. SrinivasaIyengar, 1962, –History of Indian Writing in English, Sterling Publishers, New Delhi.	
2.	Herbert H. Gowen, 1975, A History of Indian Literature, Seema Publications, Delhi.	
3.	K. Satchidanandan, 2003, Authors, Texts, Issues: Essays on Indian literature, Pencraft International, New Delhi.	
4.	Amit Chandri, 2001, The Picador Book of Modern Indian Literature, Macmillan, London.	
5.	Tabish Khair, 2001, Babu Fictions: Alienation in Contemporary Indian English Novels., OUP.	
<b>Web Resources</b>		
1.	<a href="http://en.wikipedia.org/wik/indian_writing_in_english">http://en.wikipedia.org/wik/indian_writing_in_english</a>	
2.	<a href="https://www.thehindu.com/books/books-children/short-history-of-indian-writing-in-english/article5226149.ece/amp/">https://www.thehindu.com/books/books-children/short-history-of-indian-writing-in-english/article5226149.ece/amp/</a>	
3.	<a href="https://www.britannica.com/biography/Sri-Aurobindo">https://www.britannica.com/biography/Sri-Aurobindo</a>	
4.	<a href="https://www.literaryladiesguide.com/author-biography/kamala-das-indian-poet/">https://www.literaryladiesguide.com/author-biography/kamala-das-indian-poet/</a>	
5.	<a href="https://www.britannica.com/biography/Anita-Desai">https://www.britannica.com/biography/Anita-Desai</a>	

**Mapping with Programme Outcomes:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	3	3	3	2	3	3	3	2
CO2	2	3	3	2	2	3	2	2	2	3
CO3	3	3	2	2	3	2	3	2	3	2
CO4	3	3	3	3	2	3	3	2	3	2
CO5	3	2	3	3	3	3	2	2	2	3

**3 – Strong, 2 – Medium , 1 - Low**

**Mapping Specific Outcome:**

CO /PO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	2	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
<b>Weightage</b>	15	15	15	14	15
<b>Weighted percentage of Course Contribution to Pos</b>	3.0	3.0	3.0	2.8	3.0

**3 – Strong, 2 – Medium, 1 - Low**

<b>I M.A., English</b>	<b>ENGLISH LANGUAGE TEACHING*</b>	<b>Code : EPEN25A</b>
<b>Semester – II</b>		<b>Hours : 6</b>
<b>Optional – I Elective – II</b>		<b>CREDITS :5</b>

**OBJECTIVES:**

1. To acquire the essentials of teaching English as a second / foreign language.
2. To internalize the various methods of English language teaching.
3. To impart the teaching of study skills.

**Course Outcomes:**

- CO 1 The professional skills of English Language teaching.
- CO 2 Research upon the Language.
- CO 3 Psychological theories which lead to solve many problems
- CO 4 Technological outlook over language enriched towards the teaching
- CO 5 Understanding of British English through the Indian Standard English.

SEMESTER II	COURSE CODE: EPEN25A					COURSE TITLE: English Language Teaching								HOURS:6	CREDITS:5
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)								MEAN SCORE OF CO'S	
CO	P O 1	P O 2	P O 3	P O 4	P O 5	PS O1	PS O2	PS O3	PS O4	PS O5	PS O6	PS O7	PS O8	Mean score	
CO1	5	5	4	4	5	5	5	5	4	5	5	5	3	4.6	
CO2	5	5	4	5	5	5	5	5	3	5	5	5	5	4.7	
CO3	5	5	4	5	5	5	5	5	3	5	5	5	5	4.7	
CO4	5	5	5	5	5	5	5	5	3	5	5	5	3	4.7	
CO5	5	5	5	5	5	5	5	5	3	5	5	5	3	4.7	
Mean Overall Score														4.6	

Result : The score of this course 4.6 (**VERY HIGH**)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

The value shows that the course has **VERY HIGH** association with programme outcomes and programme specific outcomes

**Unit – I** **20 Hrs**

1. A Brief History of English Language Teaching
2. The Nature of Approaches and Methods in Language Teaching
3. The role of English in India.

**Unit – II** **15 Hrs**

Theories of language learning -- Behaviouristic theory; Cognitive theory; First language acquisition and Second language learning.

**Unit – III** **20 Hrs**

Approaches and Methods:

1. The Oral Approach and Situational Language Teaching
2. Grammar Translation
3. Audio-lingual
4. Communicative Language Teaching.
5. Competency Based Language Teaching.

**Unit – IV** **15 Hrs**

Curriculum Designing; Testing and Evaluation.

**Unit – V** **20 Hrs**

Study Skills:-

1. Teaching of LSRW skills
2. Teaching Comprehension; Making Speeches; Debating.
3. Error Analysis
4. Strategies and Techniques for Effective Self- Study

**TEXT BOOKS:**

1. Richards, J and Rudgers, S. **Approaches and Methods in Language Teaching**, Cambridge University Press, 2001.
2. Roger Gower, **Teaching Practice Hand Book A Reference Book for E F I Teachers in Training**; New Delhi, 1983.
3. Prakasam v, **Semantic Theories and Language Teaching**, Delhi, 1986.
4. Kindella Valerie, **Language Teaching and Linguistics Surveys**, Cambridge, Oup, 1978.
5. E. William Rutherford, **Second Language Grammar; Learning and Teaching**, New Delhi, Longman, 1987.
6. Jack C. Richards and Theodore S. Rodgers. **Approaches and Methods in Language Teaching** Second Edition, Cambridge: Cambridge University Press. 2006.
7. Krishnaswamy N. and Lalitha Krishnaswamy. 2007. **The Story of English in India**. New Delhi: Foundation Books.
8. **A History of English Language, Teaching**, Second Edition A.p.r Howett with H.G. Widow Son.
9. **Developments in English for Specific Norms: A multi – disciplinary approach**. Cambridge, England. Dudley – Evans. T. and St. John M.J (1998) Cambridge University Press.

**REFERENCE BOOKS:**

1. Elklis, R. **Understanding School Languages Acquisition**, London, OUP, 1985.
2. Pit Corder, S. **Introducing Applied Linguistics, Harmondsworth**, Penguin, 1973.

3. Yalden, I. **The Communicative Syllabus: Evolution Design & Implementation.** Penguin, 1983.
4. Oller J.W.Jr. **Language Test at School**, London Longman, 1979.
5. David Nunan, **Language Teaching Methodology**, Prentice Hall, 1991
6. Howall A.P.R., **A History of English Language Teaching**, OUP, 1984.

**QUESTION PAPER PATTERN**

**ENGLISH LANGUAGE TEACHING**

**Code: EPEN25A**

**Section-A Total Marks-75**

- |    |   |                          |
|----|---|--------------------------|
| I. | Short Questions (covering all units) (50 words) | (No Choice)<br>– 10x2=20 |
|----|---|--------------------------|

**Section-B**

- |     |  |           |
|-----|--|-----------|
| II. | Paragraph Questions (150 words)<br>(Either Or) | – 5x5 =25 |
|-----|--|-----------|

**Section-C**

- |      |   |           |
|------|---|-----------|
| III. | Essay Questions (300 words)<br>(3 out of 5) | – 3x10=30 |
|------|---|-----------|

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Total - 75 Marks

**Note: Questions must be taken covering all units in all the three sections**



<b>I M.A., English</b>	<b>CREATIVE WRITING IN ENGLISH</b>	<b>Code : EPEN26A</b>
<b>Semester- II</b>		<b>Hours :6</b>
<b>Elective- II</b>		<b>CREDITS: 5</b>

### OBJECTIVES

1. To introduce the students to the creative forms of English.
2. To expose the eminent writers in English to the students.
3. To train the students in the art of creative writing.

### Course Outcomes:

- CO 1. Comprehension of the basic principles of creative writing  
 CO 2. Skills to write a short story/article more effectively  
 CO 3. Skill to chart out ideas adapting them for screening on radio/television  
 CO 4. Ability to design printed materials, brochures , handouts, audio visual sources ,workshops etc. with uniqueness at the time of presentation  
 CO 5. Ability to judge and evaluate any work of art

SEMESTER II	COURSE CODE: EPEN26A					COURSE TITLE: CREATIVE WRITING IN ENGLISH								HOURS:6	CREDITS:5
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)								MEAN SCORE OF CO'S	
Co	P O 1	P O 2	P O 3	P O 4	P O 5	PS O1	PS O2	PS O3	PS O4	PS O5	PS O6	PS O7	PS O8	Mean score	
CO1	5	5	4	4	5	5	5	5	2	5	5	5	3	4.4	
CO2	5	5	4	5	5	5	5	5	3	5	5	5	5	4.7	
CO3	5	5	4	5	5	5	5	5	3	5	5	5	5	4.7	
CO4	5	5	5	5	5	5	5	5	3	5	5	5	3	4.7	
CO5	5	5	5	5	5	5	5	5	3	5	5	5	3	4.7	
Mean Overall Score														4.6	

Result : The score of this course 4.6 (**VERY HIGH**)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

The value shows that the course has **VERY HIGH** association with programme outcomes and programme specific outcomes

## **UNIT – I**

1. Principles of creative writing
2. Guided projects (as per the choice/ interest of the student on Fiction/ Short story/ Poems / Articles)

## **UNIT – II**

3. Feature writing
4. Short story writing

## **UNIT – III**

5. Writing for T.V/Radio
6. Writing Poetry

## **UNIT – IV**

### **INSTRUMENTAL COMPONENTS**

7. Printed materials
8. Audio-Visual Programmes
9. Practical/Workshops

## **UNIT – V**

10. Counselling
11. Evaluation

### **Text Books:**

1. Glicksberg, C.I., Creative Writing
2. Mathien, A.M., Creative Writer
3. William G.G., Creative Writing

### **Reference Books:**

1. Kuchi, J., Creative Writing and Rewriting
2. Ziegler, I., Creative Writer's Handbook
3. Skomia & others, Creative Broadcasting.

<b>II M.A., English</b>	<b>FEMINIST THEORY AND PRACTICE</b>	<b>Code: PEN31B</b>
<b>Semester – III</b>		<b>Hours:6</b>
<b>Core Theory –IX</b>		<b>CREDITS:5</b>

**Objectives:**

1. To introduce the learners to the origin, development, and theories of feminism.
2. To introduce the students to Feminist writers who have brought a distinctly feminist perception of human experiences into English Literature.
3. To encourage Feminist re-readings of texts.

**Course Outcomes:**

CO1 Understand feminist theories and get familiar with the major concepts and theories of gender studies.

CO2 Develop a critical understanding of gender inequalities and social injustice

CO3 Relate theory and practice through deep insight.

CO4 Be aware of women's experience in the historical and contemporary society.

CO5 Frame a new outlook and skill for a better change in the society.

SEMESTER III	COURSE CODE: PEN31B					COURSE TITLE: Feminist Theory and Practice								HOURS:6	CREDITS:5
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)								MEAN SCORE OF CO'S	
CO	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	Mean score	
CO1	5	4	5	3	4	5	5	5	3	4	5	5	4	4.3	
CO2	5	5	5	3	5	5	5	5	3	4	5	5	5	4.6	
CO3	5	5	5	3	4	5	5	5	3	4	5	5	5	4.5	
CO4	5	5	5	3	4	5	5	5	3	4	5	5	3	4.3	
CO5	5	5	5	3	5	5	5	5	3	4	5	5	3	4.8	
Mean Overall Score														4.5	

Result: The score of this course 4.5 (**VERY HIGH**)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

The value shows that the course has **VERY HIGH** association with programme outcomes and programme specific outcomes

**UNIT-I** **20 Hrs**  
**INTRODUCTION TO FEMINIST THEORY**

1. Liberal Feminism.
2. Radical Feminism.
3. Marxist Feminism.
4. Socialist Feminism.
5. Cyber Feminism.
6. Post Feminism.

**UNIT-II** **15 Hrs**

**Poetry: (Detailed)**

1. Margaret Atwood : A Photograph of Me
2. Mary Oliver : Wild Geese
3. Maya Angelou : Phenomenal Women
4. Gwendolyn Brooks : The Mother
5. Adrienne Rich : Snapshots of a Daughter - in - law
6. Gauri Deshpande : The Female of the Species
7. Toru Dutt : Sita
8. Anna Wickham : The Affinity

**UNIT-III** **20Hrs**

**Drama: (Detailed)**

Mahasweta Devi : Mother of 1084

**Drama: (Non – Detailed)**

1. L. Hellman : The Little Foxes
2. Dina Mehta : Brides are not for Burning

**UNIT-IV** **15 Hrs**

**Prose : (Detailed)**

Elaine Showalter : Towards Feminist Poetics.

**Prose : (Non – Detailed)**

Mary Wollstonecraft : Vindication of the Rights of a Woman.

**UNIT-V** **20 Hrs**

**Fiction:**

1. Anita Desai : Fasting, Feasting
2. Ismat Chughtai : All for a Husband (Short Story- Translated from Urdu by Manushi)
3. Gita Hariharan : The Thousand Faces of Night.

**Text Books:**

1. Jose, Claramma. *Feminisms an Introduction*, An Aresseril House Publication, Chennai, June 2005..
2. Wollstonecraft, Mary. *A Vindication of the Rights of Woman*. Printed at Boston, by Peter Edes for
3. Thomas and Andrews, Faust's statue, no. 45, Newbury-street, MDCCXCII. [1792]; Bartleby.com, 1999.
4. Mehta, Dina. *Brides are not for Burning*, Rupa and co Publishers, 1993.
5. Brooks, Gwendolyn, *A New Chicago Anthology*, Map of Kansas Literature, Jump Bad .

**Reference Books:**

1. Wright, Judith. The Old Prison, Tiffany Copley.
2. Akiko, Yosana. River of Stars: Selected Poems, Translated by Sam Hamill and Keiko.
3. Devi, Mahasweta. Mother of 1084, Samik Bandyopadhyay
4. Chughtai, Ismat. All For a Husband, Translated by Asaduddin.

**QUESTION PAPER PATTERN**

**FEMINIST THEORY AND PRACTICE**

**Total Marks-75**

**Section-A**

- I. Short Questions (covering all units) / Annotations (only from detailed texts)  
(50 words) (No Choice) – 10x2=20

**Section-B**

- II. Paragraph Questions (150 words) – 5x5 =25  
(Either Or)

**Section-C**

- III. Essay Questions (300 words) – 3x10=30  
(3 out of 5)

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Total - 75 Marks

**Note: Questions must be taken covering all units in all the three sections**

<b>II M.A., English</b>	<b>SHAKESPEARE</b>	<b>Code: PEN32B</b>
<b>Semester - III</b>		<b>Hours: 6</b>
<b>Core Theory –X</b>		<b>CREDITS: 5</b>

**Objectives:**

Students are enabled:

- To acquire knowledge of Shakespeare’s contribution to the development of English literature and language.
- To gain knowledge and understanding necessary to explain his dramatic skills.

**Course Outcomes:**

CO 1- Enrich themselves in various techniques of drama

CO 2- Think over the development of drama

CO 3- Exhibit various research themes of Shakespeare to stabilize the society.

CO 4- Promote the Indian Society through Shakespeare’s Dramas.

CO 5- Write stories and emerge as an actor, director etc.

SEMESTER III	COURSE CODE: PEN32B					COURSE TITLE: Shakespeare								HOURLS:6	CREDITS:5
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)								MEAN SCORE OF CO'S	
CO	P O 1	P O 2	P O 3	P O 4	P O 5	PS O1	PS O2	PS O3	PS O4	PS O5	PS O6	PS O7	PS O8	Mean score	
CO1	5	5	4	4	5	5	5	5	4	5	5	5	3	4.6	
CO2	5	5	4	5	5	5	5	5	3	5	5	5	5	4.7	
CO3	5	5	4	5	5	5	5	5	3	5	5	5	5	4.7	
CO4	5	5	5	5	5	5	5	5	3	5	5	5	3	4.7	
CO5	5	5	5	5	5	5	5	5	3	5	5	5	3	4.7	
Mean Overall Score														4.6	

Result : The score of this course 4.6 (**VERY HIGH**)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

The value shows that the course has **VERY HIGH** association with programme outcomes and programme specific outcomes

**Unit – I** **18 Hrs**  
**Introduction to Shakespeare**  
1. The Elizabethan Theatre and Audience  
2. Aspects of Shakespeare:  
Shakespearean Comedy; Shakespearean Tragedy; Shakespeare’s Histories; Shakespeare’s Romances.

**UNIT – II (Detailed)** **18 Hrs**  
1. King Lear  
2. As You Like It

**Unit – III (Non-Detailed)** **18 Hrs**  
1. Othello.  
2. The Tempest

**Unit – IV (Non-Detailed)** **18 Hrs**  
1. Richard II  
2. Romeo and Juliet

**Unit – V** **18 Hrs**  
**Non-Detailed :**  
A.C. Bradley : The Substance of Tragedy

**Text Books:**

1. Turner. W., ed. Shakespeare’s **Othello**. New Delhi: Chand and Company Ltd., 2002.
2. Turner. W., ed. Shakespeare’s **As You Like It**. New Delhi: Chand and Company Ltd., 2004.
3. Turner. W., ed. Shakespeare’s **King Lear**. New Delhi: Chand and Company Ltd., 2003.
4. Lothian. I. M., ed. Shakespeare’s **Richard II**. New Delhi: OUP, 2002.
5. Turner. W., ed. Shakespeare’s **Romeo and Juliet**. New Delhi: Chand and Company Ltd., 2004.
6. Turner. W., ed. Shakespeare, William. **The Tempest**. New Delhi: Chand and Company Ltd., 2002.

**Reference Books:**

- 1) Macbeth, Bradley A.C., **Shakespeare Tragedy; Lectures on Hamlet, Othello, King Lear**, Macmillan, New Delhi, 1985.
- 2) Charlton H. B., **Shakespearean Comedy**, New Delhi, Methuen, 1966.
- 3) Burrow, Colin., Ed., William Shakespeare “**The Complete Sonnets and Poems**”. New York: OUP, 2002.

## **QUESTION PAPER PATTERN**

### **SHAKESPEARE**

**Total Marks-75**

#### **Section-A**

- I. Short Questions (covering all units) / Annotations (only from detailed texts)  
(50 words) (No Choice) – 10x2=20

#### **Section-B**

- II. Paragraph Questions (150 words) – 5x5 =25  
(Either Or)

#### **Section-C**

- III. Essay Questions (300 words) – 3x10=30  
(3 out of 5)

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Total - 75 Marks

**Note: Questions must be taken covering all units in all the three sections**



<b>II M.A., English</b>	<b>CONTEMPORARY CRITICAL THEORY</b>	<b>Code: PEN33B</b>
<b>Semester – III</b>		<b>Hours: 6</b>
<b>Core Theory –XI</b>		<b>CREDITS:4</b>

**Objectives:**

Students will be able:

1. To understand the changing theories in the post-modern phase.
2. To understand the recent contexts, concepts and ideologies.

**Course Outcomes:**

At the end of the course, the students

CO1: Understand the class division in the society.

CO2: Enhance the analytical thinking.

CO3: Understand the differences in culture.

CO4: Grasp the reader centred approaches.

CO5: Recognise and understand gender discrimination.

Semester III	Course code : <b>PEN33B</b>					COURSE TITLE: Contemporary critical theory								Hours: 6	Credits: 4
Co	Programme out come					Programme & papers out come								Mean Score	
	P O 1	P O 2	P O 3	P O 4	P O 5	PS O8 1	PSO 8 2	PS O8 3	PS O8 4	PS O8 5	PS O8 6	PS O8 7	PSO 8 8		
CO1	5	5	5	5	5	5	5	5	4	5	4	5	5	4.8	
CO2	5	5	5	4	4	5	5	4	5	5	4	5	4	4.6	
CO3	5	5	5	5	5	5	5	5	4	5	5	4	4	4.7	
CO4	5	5	4	5	4	5	5	5	5	4	5	5	5	4.8	
CO5	5	5	5	4	5	5	5	4	4	5	4	4	5	4.6	
Mean overall score													4.7		

Result: The score of this course 4.7 (**VERY HIGH**)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

The Value shows that course has **VERY HIGH** association with programme outcomes and programme specific outcomes.

**Unit – I** **20 Hrs**

1. Allen Tate : Tension in Poetry
2. Virginia Woolf : Modern Fiction

**Unit – II** **20 Hrs**

1. Viktor Shklovsky : Art as Technique
2. Raymond Williams : Marxism and Literature

**Unit – III** **10 Hrs**

Ernest Jones : Hamlet - The Psycho Analytical Solution.

**Unit – IV** **20 Hrs**

1. Edward Said : Crisis
2. David Lodge : Modernism, Anti- Modernism, Post-Modernism

**Unit – V** **20 Hrs**

1. Stanley Fish : Is There a Text in This Class?
2. Toril Moi : Feminist, Female, Feminine

**Text Books:**

- 1) Lodge David. **Modern Criticism and Theory: A Reader**, Longman: New Delhi, 1992.
- 2) Moil, Toril. **French Feminist Thought: A Reader**. Oxford: Basil Blackwell, 1987.
- 3) Moi, Toril. **Sexual and Textual Politics: Feminist Theory**. Methuen, 1985.

**Reference Books:**

- 1) Barry, Peter. **Beginning Theory**. Manchester: Manchester University Press, 2002.
- 2) Frye, Northrop. **Anatomy of Criticism**. Princeton: Princeton University Press, 1957.
- 3) Murfin, Ross, and Supriya M. Ray. **The Bedford Glossary of Critical and Literary Terms**. New York: Macmillan Press Ltd., 1997.
- 4) Sethuraman V.S and C.T. Indra, **Practical Criticism**, Madras: OUP, 1990.
- 5) L.Lemon and M. Reis. In **Russian Formalist Criticism: Four Essays**. U of Nebraska P, 1966.

<b>II M.A., English</b>	<b>NEW LITERATURES</b>	<b>Code: PEN41B</b>
<b>Semester – IV</b>		<b>Hours: 6</b>
<b>Core Theory –XIII</b>		<b>CREDITS: 5</b>

**Objective:**

To introduce the changes which have taken place in literature during the post-colonial period.

**Course Outcomes:**

**At the end of the course students**

CO1 Perceive a range of genres, contexts, and cultures.

CO2 Develop major critical approaches to literary interpretation.

CO3 Comprehend major conventions, tropes, and themes of abolitionist Literature.

CO4 Discuss the historical context of a literary work.

CO5 Comprehend the features with regard to individual authors/works.

SEMESTER -VI	COURSE CODE: PEN41B	COURSE TITLE: New Literatures										HOURS:6	CREDIT S:5	
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)								MEAN SCORE OF CO'S
Co	PO 1	P O 2	P O 3	PO 4	P O 5	PS O1	PS O2	PS O3	PS O4	PS O5	PS O6	PS O7	PS O8	Mean score
CO1	5	5	4	1	5	5	5	5	5	4	5	5	5	4.5
CO2	5	5	4	1	5	5	5	2	2	2	4	4	5	3.7
CO3	5	5	3	1	5	5	5	4	4	4	5	5	5	4.3
CO4	5	5	5	1	5	5	5	4	4	4	5	5	5	4.4
CO5	5	5	5	1	5	5	5	2	2	2	4	4	4	3.7
Mean Overall Score														4.1

Result: The score of this course 4.1 (**VERY HIGH**)

<b>Association</b>	<b>1%-20%</b>	<b>21%-40%</b>	<b>41%-60%</b>	<b>61%-80%</b>	<b>81%-100%</b>
<b>Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Interval</b>	<b>0&lt;=rating&lt;=1</b>	<b>1.1&lt;=rating&lt;=2</b>	<b>2.1&lt;=rating&lt;=3</b>	<b>3.1&lt;=rating&lt;=4</b>	<b>4.1&lt;=rating&lt;=5</b>
<b>Rating</b>	<b>Very Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>High</b>	<b>Very High</b>

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome

**UNIT –I** **13 Hrs**

**Poetry (Detailed)**

1. Chinua Achebe : Refugee Mother & Child
2. Walcott : Ruins of a Great House
3. Wole Soyinka : Telephonic Conversation
4. Irwing Layton : Shakespeare
5. Zulfikar Ghose : This Landscape, These People

**UNIT –II** **12 Hrs**

**Poetry (Non-detailed)**

1. George Bowering : Grandfather
2. Jessy Macky : Noosing of the Sun God
3. Bruce Dawe : Homecoming
4. Yasmin Gooneratne : This Language and This Woman
5. Shirley Geok-Lina Lim : On Reading Coleridge's Poem
6. Emily Liang : United We Stand

**UNIT – III** **25 Hrs**

**Drama (Detailed)**

Wole Soyinka : Kongi's Harvest

**Drama (Non-Detailed)**

Ameri Baraba : The Dutchman

**UNIT – IV** **20 Hrs**

**Prose (Detailed)**

Alice Walker : In Search of My Mother's Garden

**Prose (Non-detailed)**

Margaret Atwood : Survival

**UNIT – V** **20 Hrs**

**Fiction**

Chimamanda Adichie : Purple Hibiscus

Salman Rushdie : Midnight Children

Bapsi Sidhwa : Ice Candy Man

**Text**

1. Ashcroft, Bill, Gareth Griffiths, and Helen Tiffen, eds. **The Postcolonial Studies Readers**. London : Routledge, 1995.
2. Ashcroft, Bill, Gareth Griffiths, and Helen Tiffen, eds. **The Postcolonial Studies: Key Concepts**, London : Routledges, 2000.
3. Lazarus, Neil. **The Cambridge Companion to Post colonial Literary Studies**, Cambridge : CUP, 2004.

**Reference**

1. Bruce Dawe, **Selected Poems**, Essex, Longman, 1984.
2. Atwood Margaret, **The New Oxford Book of Canadian Verse in English**, Toronto, OUP, 1982.
3. Achebe Chinua, **Man of the People**, Longman, 1982.

**QUESTION PAPER PATTERN**

**NEW LITERATURES**

**Total Marks-75**

**Section-A**

- I. Short Questions (covering all units) / Annotations (only from detailed texts)  
(50 words) (No Choice) – 10x2=20

**Section-B**

- II. Paragraph Questions (150 words) – 5x5 =25  
(Either Or)

**Section-C**

- III. Essay Questions (300 words) – 3x10=30  
(3 out of 5)

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Total - 75 Marks

**Note: Questions must be taken covering all units in all the three sections**

<b>II M.A., English</b>	<b>POST MODERN LITERATURE</b>	<b>Code: PEN42B</b>
<b>Semester – IV</b>		<b>Hours: 6</b>
<b>Core Theory –XIV</b>		<b>CREDITS: 5</b>

**Objectives:**

To familiarize the students with Post Modern concepts and texts.

**Course Outcomes:**

CO1: Knowledge of the recent trends in the field.

CO2: Flares with different cultural aspects across the nation.

CO3: Analytical thinking.

CO4: Grasp of the existing social norms through literature.

CO5: Self-motivation to do research work.

<b>SEMESTER III</b>	<b>COURSE CODE: PEN42B</b>					<b>COURSE TITLE: Post Modern Literature</b>								<b>HOURS:6</b>	<b>CREDITS:5</b>
<b>COURSE OUTCOMES</b>	<b>PROGRAMME OUTCOMES(PO)</b>					<b>PROGRAMME SPECIFIC OUTCOMES (PSO)</b>								<b>MEAN SCORE OF CO'S</b>	
<b>CO</b>	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>	<b>PSO6</b>	<b>PSO7</b>	<b>PSO8</b>	<b>MEAN SCORE</b>	
<b>CO1</b>	4	3	4	5	5	4	4	4	4	5	3	4	4	4.0	
<b>CO2</b>	5	4	5	5	5	4	4	5	4	5	4	5	5	4.6	
<b>CO3</b>	5	5	4	4	5	5	5	5	4	4	4	5	4	4.5	
<b>CO4</b>	4	4	5	5	5	4	4	5	5	5	4	4	4	4.4	
<b>CO5</b>	4	4	3	4	4	4	5	5	5	4	4	4	5	4.2	
<b>Mean Overall Score</b>														4.3	

Result: The score of this course 4.3 (**VERY HIGH**)

<b>Association</b>	<b>1%-20%</b>	<b>21%-40%</b>	<b>41%-60%</b>	<b>61%-80%</b>	<b>81%-100%</b>
<b>Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Interval</b>	<b>0&lt;=rating&lt;=1</b>	<b>1.1&lt;=rating&lt;=2</b>	<b>2.1&lt;=rating&lt;=3</b>	<b>3.1&lt;=rating&lt;=4</b>	<b>4.1&lt;=rating&lt;=5</b>
<b>Rating</b>	<b>Very Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>High</b>	<b>Very High</b>

The Value shows that the course has **VERY HIGH** association with programme outcomes and programme specific outcomes.

**Unit – I Introduction to Post Modernism 15 Hrs**

- Peter Barry : Beginning Theory chapter on Postmodernism (pg. no.78-90)  
Linda Hutcheon : Historiographic Metafiction – The Pastime of Past time  
A Poetic of Post Modernism (pg. No. 105 – 123)  
Ihab Hassan : Toward a Concept of Postmodernism.

**Unit – II Poetry (Detailed) 20 Hrs**

- Carol Ann Duffy : Valentine  
Pablo Neruda : If You Forget Me  
Octavio Paz : No More Clichés  
Tomas Transtromer : The Blue House  
Torge Luis Borges : Borges and I

**Unit – III Drama (Detailed) 15 Hrs**

- Edward Bond : Lear  
Tom Stoppard : The Real Inspector Hound

**Unit – IV Short Story 20 Hrs**

- Haruki Murakami : The Second Bakery Attack  
Ryunosuke Akitlagawa : In the Bamboo Groove

**Unit – V Novel 20 Hrs**

- Gabriel Garcia Marquez : One Hundred Years of Solitude  
Shashi Tharoor : Great Indian Novel  
Italo Calvino : The Castle of Crossed Destinies

**Text Books:**

1. Barry, Peter. **Beginning Theory**. MUP, London.2014
2. Hoover, Paul. **Postmodern American Poetry**. Norton, New York.2013
3. Stoppard, Tom. **The Real Inspector Hound**. New York: Samuel French Inc.,1968.
4. Marquez, Gabriel Garcia. **One Hundred Years of Solitude**. New York: Harper Perennial, 1991.
5. Tharoor, Shashi. **The Great Indian Novel**. New Delhi. Penguin Books India.1989.

**Reference Books:**

1. Hutcheon, Linda, Poetics of Postmodernism, Routledge India. 1994
2. O'Brien, Sean, The Deregrulated Muse, Blood Axe, London. 1997

**QUESTION PAPER PATTERN**

**POST MODERN LITERATURE**

**Total Marks-75**

**Section-A**

- I. Short Questions (covering all units) / Annotations (only from detailed texts)  
(50 words) (No Choice) – 10x2=20

**Section-B**

- II. Paragraph Questions (150 words) – 5x5 =25  
(Either Or)

**Section-C**

- III. Essay Questions (300 words) – 3x10=30  
(3 out of 5)

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Total - 75 Marks

**Note: Questions must be taken covering all units in all the three sections**



<b>II M.A., English</b>	<b>Comparative Literature</b>	<b>Code: PEN43B</b>
<b>Semester – IV</b>		<b>Hours: 6</b>
<b>Core Theory –XV</b>		<b>CREDITS: 4</b>

**Objectives:**

1. To gain a working knowledge of the origin and development of comparative studies
2. To compare literary and non-literary texts of other languages of the world with English.
3. To help students recognize the various thought and language pattern.

**Course Outcomes:**

**At the end of the course, students will exhibit**

CO1: Knowledge in new areas that is about the concept of comparative Literature.

CO2: Knowledge about literatures of the world and analyze the texts critically

CO3: knowledge of using comparison as a tool of criticism.

CO4: Effective communicative ideas related to the world historical contexts of literary production and reception of diverse ideas.

CO5: a broad outlook on literature as Comparative Literature involves ‘Mutual Illumination’

SEMESTER -IV		COURSE CODE: PEN43B				COURSE TITLE: Comparative Literature						HOURS:6		CREDITS: 4
COURSE OUTCOMES		PROGRAMME OUTCOMES(PO)				PROGRAMME SPECIFIC OUTCOMES (PSO)								MEAN SCORE OF CO'S
Co	PO 1	PO 2	PO 3	PO 4	PO 5	PS O1	PS O2	PS O3	PS O4	PS O5	PS O6	PS O7	PS O8	Mean score
CO1	5	5	5	2	5	5	5	3	2	4	4	4	5	4.1
CO2	5	5	5	5	5	5	5	2	2	2	4	5	5	4.2
CO3	5	4	3	2	5	5	5	5	5	3	4	5	5	4.3
CO4	5	5	3	5	3	5	5	1	1	1	3	3	4	3.3
CO5	5	5	3	3	2	4	5	2	2	2	2	4	4	3.3
Mean Overall Score														3.84

Result: The score of this course 3.84 (**HIGH**)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcome and Programme Specific Outcome

### **Unit I**

Definition of the term Comparative Literature – National Literature – World Literature and Comparative Literature – French School and American School, German School and Russian School.

### **Unit II**

Influence and Imitation – Unconscious Imitation and Conscious Influence – Translation – Influence Studies and Analogy Studies – Comparing Hawthorne's *The Scarlet Letter* with Anandamoorthy's *Samskara*.

### **Unit III**

Epoch, Period and Generation – the Link between Comparative Literature and History of Literature – The difference between Epoch, Period and Generation.

### **Unit IV**

Genres – Comparing two Texts on the basis of Form – Comparing Novels, Plays and Poems – Variations – a Drama and an Epic also can be compared based on the Common Qualities – Comparing Burns with Bharathidasan and Bacon with Valluvar, Kamban with John Milton, Bharathidasan with Wordsworth.

### **Unit V**

Thematology – Comparing Works on the basis of Themes – Defining Terms like Motif, Leitmotif – Characters and Situations. In addition to these, the teacher can illustrate the Study of Comparative Literature by comparing Antony and Cleopatra with *All for Love* and Faust with *Dr Faustus*. Gayathri Spivak- *Death of a Discipline*.

### **Text Books**

1. Brooks, Cleanth and Robert Penn Warren. *Modern Rhetoric*. Atlanta: Harcourt, Brace & world, 1958.
2. Mohan, Devinder. *Comparative Poetics: Aesthetics of the Ineffable*. New Delhi: Intellectual Publishing House, 1988 .
3. Peck, John and Martin Coyle. *Practical Criticism*. New York: Palgrave, 1995.
4. Daiches, David. *Critical Approaches to Literature*. Kolkata: Orient Longman, 2006.
5. Spivak, Gaythri Chakravorty. *Death of a Discipline*. Columbia: Colombia University Press, 2003.

### **Reference Books**

- Ulrich Weisstein. *Comparative literature and literary theory: Survey and Introduction*. Indiana University Press, 1974 .
- George, K. M. ed. *Comparative Indian Literature Vol. 1&2*. Madras: Macmillan India Limited, 1984.

**QUESTION PAPER PATTERN**

**COMPARATIVE LITERATURE**

**Total Marks-75**

**Section-A**

- I. Short Questions (covering all units) (50 words) (No Choice)  
– 10x2=20

**Section-B**

- II. Paragraph Questions (150 words) – 5x5 =25  
(Either Or)

**Section-C**

- III. Essay Questions (300 words) – 3x10=30  
(3 out of 5)

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Total - 75 Marks

**Note: Questions must be taken covering all units in all the three sections**

<b>UG I YEAR</b>	<b>சுற்றுலாவியல் முதலாம் ஆண்டு (B.A., Tamil)</b>	<b>CODE:ATA202B</b>
<b>SEMESTER – II</b>		<b>HRS/WEEK – 6</b>
<b>Main- I</b>		<b>CREDIT – 5</b>

**அலகு-1**

சுற்றுலாஒருவிளக்கம் - உலகநாடுகளில் சுற்றுலாவளர்ச்சி - பாரதத்தில் சுற்றுலாவளர்ச்சி - தமிழ்நாட்டில் சுற்றுலாவளர்ச்சி

**அலகு-2**

பன்னாட்டுப்பயணிகள் - சுற்றுலாவின் சமூகப்பொருளாதாரவிளைவுகள் - சுற்றுலாப்பயணிகள் பற்றியபுள்ளிவிவரங்கள்

**அலகு-3**

சுற்றுலாவைத் திட்டமிடுதலும் மேம்படுத்தலும் - சுற்றுலாவிடுதிகள் - சுற்றுலாப்பயணிகளின் பல்வேறுபோக்குவரத்துகள்

**அலகு-4**

சுற்றுலாக் கழகங்கள் - சுற்றுலாபயணமுகவர்கள் - சுற்றுலாவின் வணிகச்சந்தைகள்

**அலகு-5**

சுற்றுலாவின் வழிகாட்டிகள் - தமிழ் இலக்கியத்தில் பயணநூல்கள்

**பாடநூல் :** கிருட்டிணசாமி. வெ., சுற்றுலாவளர்ச்சி, மாணிக்கவாசகர் பதிப்பகம், முதற்பதிப்பு-1986.

**பார்வை நூல்கள் :**

1. சுற்றுலாவியல் ஓர் அறிமுகம். முனைவர்.ச.ஈஸ்வரன், பாவைப்பதிப்பகம்,
2. ச.ஷ., சுற்றுலாவியல், பாவைப்பள்ளிகேஷன்ஸ், முதற்பதிப்பு 1998, சென்னை.
3. சாந்தக்குமாரி, இரா., சுற்றுலா, சாந்தாபள்ளிகேஷன்ஸ், முதற்பதிப்பு- 1998,
4. ம.இரா.தங்கமணி, சுற்றுலாவியல் ஓர் அறிமுகம், முத்துப்பதிப்பகம், பாரிநிலையம், சென்னை.

<b>PG I YEAR</b>	<b>பண்பாட்டுமானிடவியல் முதலாம் ஆண்டு (M.A., Tamil)</b>	<b>EPTA14</b>
<b>SEMESTER – I</b>		<b>HRS/WEEK – 6</b>
<b>Elective - 1</b>		<b>CREDIT – 5</b>

**அலகு- 1.** மானிடவியலின் தோற்றம் அரிஸ்டாட்டிலின் கொள்கைமானிடவியலின் உலகம் தழுவியவளர்ச்சி

**அலகு- 2.** மானிடவியல் பிரிவுகளின் அறிமுகம் -உடல்சார் மானிடவியல் பண்பாட்டுமானிடவியல் தொல்லியல் - மொழியியல்.

**அலகு- 3.** சாதிமுறை-சாதிமுறையின்வகைகள் - இந்தியச்சாதிமுறை-சாதிக்கொள்கைகள் - மரபுக்கொள்கை-தொழிற்கொள்கை-சமயக்கொள்கை-அரசியற்கொள்கை-படிமலர்ச்சிக்கொள்கை - குடிஊழியமுறை

**அலகு- 4.** சமயநம்பிக்கைகளும் வாழ்வியலும் - சமயத்தின் தோற்றம்

ஆவியுலகக்கோட்பாடு-உயிரியம் - குலக்குறியியம் - முன்னோர்வழிபாடு-  
புனிதத்தன்மையைஏற்படுத்தியுள்ளமை-சடங்குமுறைகள் - மக்கள் வாழ்வியல்  
சமயத்தின் பங்கு

**அலகு- 5.** உணவுஈட்டுதலும் பரிமாற்றமுன்றகளும் - பொருளியல் முறைகள் -  
பரிமாற்றமும் பகிரிந்துகொள்ளுதலும் - பொதுப்படியானபரிமாற்றம் சமச்சீர்  
பரிமாற்றம் - குலப்பரிமாற்றம் - குடிஊழியமுறை-விருந்துப்பரிமாற்றம் -  
மௌனப்பரிமாற்றம் அன்பளிப்புப் பரிமாற்றம் மறு பங்கீட்டுமுறை.

### Referenc Books

- பண்பாட்டுமானிடவியல் - பக்தவச்சலபாரதி.
- சங்க இலகியம் (சமூகமானிடவியலின் ஆய்வுக்கட்டுரைகள்) சிலம்பு நா.  
செல்வராசு,அனிச்சம்.
- பாணர் இனவரைவியல் பக்தவச்சலபாரதி,அடையாளம் வெளியீடு:2015

### Online Contents (Mooc,Swayam, Nptel, Websities etc)

- Tamil Heritage Foundation  
[www.tamilheritage.org](http://www.tamilheritage.org)<<http://www.tamilheritage.org>>
- Tamil virtualUniverity Library-  
[www.tamilvu.org/library](http://www.tamilvu.org/library)<http://www.vitualvu.org/library>
- Project Madurai – [www.projectmadurai.org](http://www.projectmadurai.org).

Tamil Books on line – [books.tamilcube.com](http://books.tamilcube.com)

<b>PG I YEAR</b>	<b>பெண் படைப்பாளரின் இலக்கியங்கள் முதலாம் ஆண்டு</b>	<b>EPTA15</b>
<b>SEMESTER – I</b>	<b>(M.A., Tamil)</b>	<b>HRS/WEEK – 6</b>
<b>Elective – II</b>		<b>CREDIT – 5</b>

**அலகு- 1.** பெண் இலக்கியவரலாறு-பெண் இலக்கியக் கொள்கைகள்  
பற்றியவிளக்கங்கள்,பெண் இலக்கியப்பகுப்பு,பெண்மை இலக்கியம் இலக்கியம் -  
பெண்நிலை இலக்கியம் என்றபடிநிலைகள்,பெண்ணிய இலக்கியம் பெண்நிலை  
இலக்கியம் என்றபடிநிலைகள்.

**அலகு- 2.** பெண்பாற்

புலவர்கள்,ஒளவையார்,வெள்ளிவீதியார்,பொன்முடியார்,காரைக்காலம்மையார்,ஆண்ட  
ரள் ஆகியோரின் தேர்ந்தெடுக்கப்பட்டபாடல்கள்.

**அலகு- 3.** பெண் நாவலாசியர்கள்:

இராஜம்கிருஷ்ணன்,உமாமகேஸ்வரி,பாமாஆகியோரின்  
தேர்ந்தெடுக்கப்பட்டபாடல்கள்.

**அலகு- 4.** பெண்படைப்பாளர்களின் சிறுகதைகள்: வீட்டின் மூலையில்

சமையலறை - அம்பை,அனுராதா- பொன்னுத்தாயி,பாமா-அறிவுஜீவி,சுப்பிரமணியன்  
- இந்தியாகேட்,காவேரிவதம் - திலகவதி.

**அலகு- 5.** பெண் கவிஞர்களின் படைப்புகள்:

இரா.மீனாட்சி,சுப்பிரமணியன்,கல்பனா,கனிமொழி,சுகிர்தராணி,மாலதி,குட்டிரேவதி,  
இளம்பிறை,அ.வெண்ணிலா,அழகுநிலா,சக்திஜோதி,தமிழ்ச்சிதங்கப்பாண்டியன்,லீனா  
மணிமேகலை,மனுஷி முதலியயோரின் தேர்ந்தெடுக்கப்பட்டகவிதைகள்.

### Referenc Books

- பெண்மையச் சிறுகதைகள் இரா.பிரேமா,சாகித்தியஅகாதமிவெளியீடு,  
இரண்டாம் பதிப்பு- 2019.
- பெண்ணியச் சிறுகதைகள் - இரா.பிரேமா,காவ்யாவெளியீடு,சென்னை.

### Online Contents (Mooc,Swayam, Nptel, Websites etc)

- Tamil Heritage Foundation  
[www.tamilheritage.org](http://www.tamilheritage.org)<<http://www.tamilheritage.org>>
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[www.tamilvu.org/library](http://www.vitualvu.org/library)<http://www.vitualvu.org/library>
- Project Madurai – [www.projectmadurai.org](http://www.projectmadurai.org).
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<b>UG I YEAR</b>	<b>தமிழகவரலாறும் பண்பாடும் முதலாம் ஆண்டு</b>	<b>ETA101B</b>
<b>SEMESTER – I</b>	<b>(B.A., Tamil)</b>	<b>HRS/WEEK – 4</b>
<b>Elcative – I</b>		<b>CREDIT – 3</b>

### பாடங்கள்

**அலகு 1-** தமிழகவரலாற்றுக்கானஅடிப்படைஆதாரங்கள், இனம்,பண்பாடு,  
வரலாறு-வரையறைகள்,அடிப்படைகள்.

**அலகு 2-**பண்பாடு - தோற்றம் வளர்ச்சி-வரலாற்றுக்குமுந்தையகாலம் -  
வரலாற்றுக்காலம் - சிந்துசமவெளிப்பண்பாடும் தமிழரும் - சங்ககாலப்  
பண்பாட்டுமரபுகள்.

**அலகு3-**காலந்தோறும் சமயநிறுவனங்களின் நிலவரம் - பண்பாட்டுப்பரவல் -  
பண்பாட்டுச்சேர்க்கை-பண்பாட்டுமரபுமீல்கள்.

**அலகு 4-**கலைகள் - கலைஉருவாக்கம் - நிறுவனமாகாத-நிறுவனமானலைகள் -  
காலந்தோறும் கலைகள்,சிற்பம்,ஓவியம், இலக்கியம், இசை, கூத்து,மரபுகள்  
பெற்றமாற்றங்கள் - பழக்கவழக்கமாற்றங்கள்

**அலகு 5-**தற்காலத் தமிழ் பண்பாட்டின் (குடும்பம்,திருமணம்,விழா,சடங்கு,உடை,  
உணவு,நம்பிக்கை,அணிகலன்,விளையாட்டு.....)மீதுநிகழும் தாக்கங்கள்  
- காரணிகள் - விளைவுகள்

### பாடநூல்

- 1) **தமிழகவரலாறும்பண்பாடும்**  
டாக்டர் கே.கே. பிள்ளை  
உலகத் தமிழாராய்ச்சிநிறுவனம்

**பார்வை நூல்கள்:**

- 1) வே.தி. செல்வம்,தமிழகவரலாறும் பண்பாடும்,மணிவாசகர்பதிப்பகம்,சென்னை -108.
- 2) டாக்டர் அ.தட்சிணாமூர்த்தி,தமிழர் நாகரிகமும் பண்பாடும்,யாழ் வெளியீடு,சென்னை- 4.
- 3) தமிழ்நாட்டுப் பண்பாட்டுவரலாறு (தொகுதி 1, 2,  
3),ப.வைத்தியலிங்கன்,அண்ணாமலைப்பல்கலைக்கழகம்,அண்ணாமலைநகர் 1997
- 4) தமிழ்ப்பண்பாடுஅறிமுகம்,அருள்பத்மநாதன், ஜெயாபதிப்பகம்,சென்னை 2010
- 5) தமிழர் பண்பாடு,வையாபுரிப்பிள்ளை,சென்னைப்புத்தகாலயம்,சென்னை 1951
- 6) பண்பாட்டுமானுடவியல்,சி.பக்தவச்சலபாரதி,மணிவாசகர் பதிப்பகம்,சென்னை 1999
- 7) அறம்: .அதிகாரம்,ராஜ்தகௌதமன்,விடியல் பதிப்பகம்,கோவை 1997
- 8) தமிழககலைச்செல்வங்கள்,துளசிராமசாமி,உலகத்தமிழாராய்ச்சிநிறுவனம், 1990

<b>UG I YEAR</b>	<b>அடிப்படைத் தமிழிலக்கணம் முதலாம் ஆண்டு</b>	<b>FTA101</b>
<b>SEMESTER – I</b>	<b>(B.A., Tamil)</b>	<b>HRS/WEEK – 2</b>
<b>Foundation Course – I</b>		<b>CREDIT – 2</b>

**அலகு 1**—நிறுத்தற்குறிகளைஏற்ற இடங்களில் இடுதல் - கள் விசுவயைஎழுதும் முறை, தொகைச் சொற்களைஎழுதும் முறை,பொருளுக்குஅமைதியானசொற்கள்.

**அலகு 2**—சொற்களைப் பயன்படுத்தும் முறை—வருதல் - போதல் - அழைத்தல் - தருதல் கொடுத்தல் ஓர் - ஓர் -ஒருகருத்தைப் பலதொடர்களில் வெளியிடுதல்.

**அலகு 3**- கடிதம் வரைதல் - உரையாடல் - கட்டுரை—வாக்கியஅமைப்பு—பத்தி அமைப்பு—சுருக்கிவரைதல் - பெருக்கிவரைதல்.

**அலகு 4**—எழுத்துப்பயிற்சிகளைத் திருத்தல் - திருத்துவதுபற்றியசிலகுறிப்புகள் - படைப்பாற்றலுக்கு வழி கோலுதல் - வல்லினம் மிகும் இடம் - மிகா இடம்.

**அலகு 5**—உரைநடைகற்பித்தல் - இலக்கணம் பயிற்றுவதன் நோக்கங்கள் - பயிற்றும் முறை.

**பாடநூல்**

1. தமிழ் பயிற்றுவிக்கும் முறை—பேராசிரியர் நா.சுப்புரெட்டியார்,சிதம்பரம்

**பார்வை நூல்கள்:**

- 1) தமிழண்ணல், இனிய தமிழ் மொழியின் இயல்புகள் 1, 2, 3 –பகுதிகள்.
- 2) முத்து - கண்ணப்பன்.தி.தமிழில் தவறுகளைத் தவிர்ப்போம்,பாரிநிலையம்,சென்னை.
- 3) கீ.இராமலிங்கனார்,தமிழில் எழுதுவோம்,கழகவெளியீடு,சென்னை.

4) செ.முத்துவீராசாமிநாயுடு,ஆவணங்களும் பதிவுமுறைகளும்,கழகவெளியீடு,சென்னை.

<b>ALL UG I YEAR</b>	<b>TAMIL – 1 (Langauge)</b>	<b>LT101A</b>
<b>SEMESTER - I</b>	<b>முதலாமாண்டு</b>	<b>HRS/WEEK – 6</b>
<b>Tamil -1</b>	<b>(B.A./ B.Sc./ B.COM./ B.B.M., B.C.A./ BBACA.) – TANSHEE SYLLABUS</b>	<b>CREDIT – 3</b>

**அலகு 1. தமிழ் இலக்கிய, இலக்கணவரலாறுஅறிமுகம்**

**1. இலக்கணம்**

அ.தொல்காப்பியம், இறையனார் களவியல் உரை,நம்பியகப்பொருள்,புறப்பொருள் வெண்பாமாலை,நன்னூல்,தண்டியலங்காரம்,யாப்பருங்கலக்காரிகை- நூல்கள்

**ஆ. மொழிப்பயிற்சி-ஒற்றுப்பிழைதவிர்த்தல்**

- வல்லினம் மிகும் இடங்கள்
- வல்லினம் மிகா இடங்கள்
- ஈரொற்றுவரும் இடங்கள்
- ஒரு,ஓர் வரும் இடங்கள்
- அது, அ.து வரும் இடங்கள்
- தான்,தாம் வரும் இடங்கள்

**பயிற்சி:** வல்லினம் மிகும் இடங்கள்,மிகா இடங்கள் தவறாகவருமவகையில் ஒருபத்திகொடுத்துஒற்றுப்பிழைதிருத்திஎழுதச் செய்தல்

2. சங்க இலக்கியம் - எட்டுத்தொகை,பத்துப்பாட்டு
3. அற இலக்கியம் - பதினெண் கீழ்க்கணக்கு நூல்கள்
4. காப்பிய இலக்கியம் - ஐம்பெருங்காப்பியங்கள்,ஐஞ்சிறுகாப்பியங்கள்,சமயக்காப்பியங்கள்.
5. பக்தி இலக்கியமும் (பன்னிருதிருமுறைகள்,நாலாயிரதிவ்வியப் பிரபந்தம்) –பகுத்தறிவு இலக்கியமும் (சித்தர் இலக்கியங்கள், புலவர் குழந்தையின் இராவணகாவியம்)

**அலகு 2. சங்க இலக்கியம்**

**எட்டுத்தொகை:**

1. நற்றிணை-முதல் பாடல் - நின்றசொல்லர்
2. குறுந்தொகை 3 ஆம் பாடல் - நிலத்தினும் பெரிதே
3. ஐங்குறுநூறு –நெல் பலபொலிக! பொன் பெரிதுசிறக்க! (முதல் பாடல்) –வேட்கைப்பத்து
4. கலித்தொகை- 51 –சுடர்த்தொடிக் கேளாய் - குறிஞ்சிக்கலி
5. புறநானூறு- 189 தெண்கடல் வளாகம் பொதுமையின்றி, 187 நாடாகொன்றோ

**பத்துப்பாட்டு:**

1. முல்லைப்பாட்டு (முழுவதும்)



### அலகு 3 அற இலக்கியம்

1. திருக்குறள் - அறன் வலியுறுத்தல் அதிகாரம்
2. நாலடியார் - பாடல் 131 (குஞ்சியழகும்)
3. நான்மணிக்கடிகை-நிலத்துக்கு அணியென்ப
4. பழமொழிநானூறு-தம் நடைநோக்கார்
5. இனியவைநாற்பது- 37 இளமையை முப்புள்ளது

### அலகு4 காப்பிய இலக்கியம்

1. சிலப்பதிகாரம் - வழக்குரைகாதை
2. மணிமேகலை-பாத்திரம் பெற்றகாதை
3. பெரியபுராணம் - பூசலார் நாயனார்புராணம்
4. கம்பராமாயணம் - குகப்படலம்
5. சீறாப்புராணம் - மானுக்குப் பிணைநின்றபடலம்
6. இயேசுகாவியம் - ஊதாரிப்பிள்ளை

### அலகு 5 பக்தி இலக்கியமும்,பகுத்தறிவு இலக்கியமும்.

#### பக்தி இலக்கியம்:

1. திருநாவுக்கரசர் தேவாரம் - நாமார்க்கும் குடியல்லேம் எனத்தொடங்கும் பாடல்
2. மாணிக்கவாசகர் திருவாசகம் - நமச்சிவாயவா அழகநாதன்தாள் வாழ்கமுதல்  
சிரம்குவிவார் ஓங்குவிக்கும் சீரோன் கழல் வெல்கவரை.
3. பொய்கையாழ்வார் - வையந்தகளியாவார்கடலே
4. பூதத்தாழ்வார் - அன்பேதகளியா
5. பேயாழ்வார் - திருக்கண்டேன் பொன்மேனிகண்டேன்
6. ஆண்டாள் - தீருப்பாவைமார்கழித்திங்கள் (முதல் பாடல்)

#### பகுத்தறிவு இலக்கியம்:

1. திருமூலர் - திருமந்திரம் (270, 271, 274, 275, 285)
2. பட்டினத்தார் - திருவிடைமருதூர் (காடேதிரிந்து-எனத்தொடங்கும் பாடல் பா.எண்.279,280)
3. கடுவெளிசித்தர் - பாபஞ்செய் யாதிருமனமே (பாடல் முழுவதும்)
4. இராவணகாவியம் - தாய்மொழிப்படலம் - 18, ஏடுகையில்லாரில்லைமுதல் - 22.  
செந்தமிழ் வளர்த்தார் வரை.

#### பார்வைநூல் :

1. முனைவர். அ. ஜெயம், தமிழ் இலக்கியவரலாறு, ஜனகாபதிப்பகம்.
2. மு.வரதராசன், தமிழ் இலக்கியவரலாறு, சாகித்ய அகாடெமி, புதுடெல்லி.
3. தமிழண்ணல், புதியநோக்கில் தமிழ் இலக்கியவரலாறு, மீனாட்சிபுத்தகநிலையம், மதுரை.
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5. புதியதமிழ் இலக்கியவரலாறு, முனைவர். சிற்பிபாலசுப்பிரமணியனம், முனைவர். நீல.பத்மநாபன்.

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8. வகைமைநோக்கில் தமிழ் இலக்கியவரலாறு,பாக்கியமேரி
9. தமிழ் பயிற்றும் முறை,பேராசிரியர் நா.சுப்புரெட்டியார்,மணிவாசகர் பதிப்பகம்,சிதம்பரம்.

<b>UG I YEAR</b>	<b>தமிழ் மரபு மருத்துவம் முதலாம் ஆண்டு</b>	<b>NTA101</b>
<b>SEMESTER – I</b>	<b>(B.A., Tamil)</b>	<b>HRS/WEEK – 2</b>
<b>Skill Enhancement Course –I(NME - I)</b>		<b>CREDIT – 2</b>

**அலகு 1**—மதிப்புமிக்க உணவும் மருந்தும் - இயற்கைமருத்துவமுன்னோடிகள் - பல்வேறுமருத்துவமுறைகள்.

**அலகு 2**—ஐம்பூதமருத்துவம் - உடலுறுப்புகளின் பாதிப்பும் நோயும்.

**அலகு 3**- இயற்கைமருத்துவம் தவிர்க்கச் சொல்லும் உணவுப் பொருட்கள் - கீரைகளும் பயன்களும் - காய்கறிகளும் பயன்களும்.

**அலகு 4**—பழங்களும் பயன்களும் - தானியங்களின் பயன்கள் - மலர்களின் பயன்கள்.

**அலகு 5**—நோய்களும் மூலிகைகளின் பயன்களும் - சமைத்த உணவும் சமைக்காத உணவும் - சில ஆரோக்கிய உணவுகள் - இயற்கைமருத்துவப் பழமொழிகள்.

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<b>PG I YEAR</b>	<b>இக்கால இலக்கியம்</b>	<b>PTA11</b>
<b>SEMESTER – I</b>	<b>முதலாம் ஆண்டு</b>	<b>HRS/WEEK – 6</b>
<b>Main – I</b>	<b>(M.A., Tamil)</b>	<b>CREDIT – 5</b>

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**அலகு 2: தெரிவுசெய்தபாடப்பகுதிகள்:** ந. பிச்சமுர்த்தி (ந. பிச்சமுர்த்தி  
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தேர்ந்தெடுத்தகவிதைகள்,எல்லை,காவியம்,குமிழிகள்),ஞானக்கூத்தன்  
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பெயர்ச்சொல்லி அழைப்பேன்:

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தந்தைபெரியார்),சிற்பி (கண்ணாடிச்சிறகுகள்ஒருபறவை: மின்துளிர்கள் -  
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இளம்பிறை,பெருந்தேவி,கல்மா,கனிமொழி,மாலதிமைத்தி,குட்டிரேவதி,என்.டி.

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**அலகு- 4**

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<b>PG I YEAR</b>	<b>அற இலக்கியம்</b>	<b>PTA12</b>
<b>SEMESTER – I</b>	<b>முதலாம் ஆண்டு</b>	<b>HRS/WEEK – 6</b>
<b>Main – II</b>	<b>(M.A., Tamil)</b>	<b>CREDIT – 5</b>

**அலகு : 1 திருக்குறள் - 1 –பொருட்பால் (20 அதிகாரங்கள்)**

- அறக்கருத்துகள் இடம் பெறும் சங்க இலக்கியங்கள் தொடங்கிவேதநாயகரின் நீதிநூல்,பெண்மதிமாலை,பாரதியாரின் புதியஆத்திசூடிவரையிலானஅங் இலக்கியங்கள் குறித்துப் பொதுநிலையில் அறிமுகம் செய்தல் - பதினெண்கீழ்க்கணக்கின் அறநூல்களைப் சிறப்புநிலையில் கற்பித்தல்.
- திருக்குறள் கூறும் அறக்கருத்துகளைப் பொருட்பாலின் தெரிவுச் செய்யப்பட்டஅதிகாரங்களின் வாயிலாகக் கற்பித்தல்.
- திருக்குறள் - சிறப்புப்பயில்வு

**பாடப்பகுதி: திருக்குறள் 1- பொருட்பால் (20 அதிகாரங்கள்)**

1. கல்வி (40 ஆவதுஅதிகாரம்)
2. கேள்வி (42 ஆவதுஅதிகாரம்)
3. அறிவுடைமை (43 ஆவதுஅதிகாரம்)
4. பெரியாரைத்துணைக்கோடல் (45 ஆவதுஅதிகாரம்)
5. சிற்றினஞ்சேராமை (46 ஆவதுஅதிகாரம்)
6. வலியறிதல் (48 ஆவதுஅதிகாரம்)
7. காலமறிதல் (49 ஆவதுஅதிகாரம்)
8. தெரிந்துவினையாடல் (52 ஆவதுஅதிகாரம்)
9. சுற்றந்தழால் (53 ஆவதுஅதிகாரம்)
10. கண்ணோட்டம் (58 ஆவதுஅதிகாரம்)
11. ஊக்கமுடைமை (60 ஆவதுஅதிகாரம்)
12. முடியின்மை (61 ஆவதுஅதிகாரம்)
13. ஆள்வினையுடைமை (62 ஆவதுஅதிகாரம்)
14. சொல்வன்மை (65 ஆவதுஅதிகாரம்)
15. வினைத்தாய்மை (66 ஆவதுஅதிகாரம்)
16. வினைசெயல்வகை (68 ஆவதுஅதிகாரம்)
17. குறிப்பறிதல் (71 ஆவதுஅதிகாரம்)
18. ஆவையறிதல் (72 ஆவதுஅதிகாரம்)
19. நாடு (74 ஆவதுஅதிகாரம்)
20. பொருள்செயல்வகை (78 ஆவதுஅதிகாரம்)

**அலகு : 2 திருக்குறள் - 2 பொருட்பால் (20 அதிகாரங்கள்)**

**பாடப்பகுதி: திருக்குறள் 2 –பொருட்பால் (20 அதிகாரங்கள்)**

1. நட்பு (70 ஆவதுஅதிகாரம்)

2. நட்பாராய்தல் (80 ஆவதுஅதிகாரம்)
3. கூடாநட்பு (83 ஆவதுஅதிகாரம்)
4. பேதைமை (84 ஆவதுஅதிகாரம்)
5. புகைத்திறம் தெரிதல் (88 ஆவதுஅதிகாரம்)
6. பேரியாரைப்பிழையாமை (90 ஆவதுஅதிகாரம்)
7. குள்ளுண்ணாமை (93 ஆவதுஅதிகாரம்)
8. சூது (94 ஆவதுஅதிகாரம்)
9. மருந்து (95 ஆவதுஅதிகாரம்)
10. மானம் (97 ஆவதுஅதிகாரம்)
11. பெருமை (98 ஆவதுஅதிகாரம்)
12. சான்றாண்மை (99 ஆவதுஅதிகாரம்)
13. பண்புடைமை (100 ஆவதுஅதிகாரம்)
14. நன்றியில்செல்வம் (101 ஆவதுஅதிகாரம்)
15. நாணுடைமை (102 ஆவதுஅதிகாரம்)
16. குடிசெயல்வகை (103 ஆவதுஅதிகாரம்)
17. உழவு (104 ஆவதுஅதிகாரம்)
18. நல்குரவு (105 ஆவதுஅதிகாரம்)
19. இரவு (106 ஆவதுஅதிகாரம்)
20. இரவச்சம் (107 ஆவதுஅதிகாரம்)

**அலகு : 3 நாலடியார் 1 –பொருட்பால் - அரசியல்**

**(முதல் 8 அதிகாரங்கள்)**

பாடப்பகுதி: நாலடியார் 1 –பொருட்பால் - அரசியல் (முதல் 8 அதிகாரங்கள்)

**அலகு : 4 நாலடியார் 2 –பொருட்பால் - அரசியல்**

**(அடுத்த 8 அதிகாரங்கள்)**

பாடப்பகுதி: நாலடியார் 1 –பொருட்பால் - அரசியல் (அடுத்த 8 அதிகாரங்கள்)

**அலகு : 5 பிறகீழ்க்கணக்கு அறநூல்கள் (ஒவ்வொன்றிலும் 5 பாடல்கள்,**

**முதுமொழிக்காஞ்சி: 1. சிறந்தப்பத்து)**

**பழமொழிநானூறு 5 பாடல்கள்**

1. பா.எண்: 8 (எந்நெறியானும்...)
2. பா.எண்: 52 (பாரதத்துள்ளும்...)
3. பா.எண்: 55 (ஆற்றவும் கற்றார்)
4. பா.எண்: 68 (எனைப்பலவேயாயினும்...)
5. பா.எண்: 149 (நெறியால் உணராது...)

**நான்மணிக்கடிகை 5 பாடல்கள்**

1. பா.எண்: 23 (மலைப்பினும்வாரணம்..)
2. பா.எண்: 28 (குழித்துழிநிற்பது...)
3. பா.எண்: 57 (என்றுமுளவாகு...)
4. பா.எண்: 69 (பதிநன்றுபல்லார்..)
5. பா.எண்: 97 (மாசுபடினுமணிதன்...)

**திரிகடுகம் 5 பாடல்கள்**

1. பா.எண்: 15 (பொய்வழங்கிவாழும்....)
2. பா.எண்: 23 (தானம்கொடுக்கும்.....)
3. பா.எண்: 68 (இல்லார்க்கு ஒன்றுஈயும்..)
4. பா.எண்: 75 (வள்ளன்மைபூண்டான்கண்.....)
5. பா.எண்: 82 (சான்றாருள்சான்றான்...)

#### சிறுபஞ்சமூலம் 5 பாடல்கள்

1. பா.எண்: 02 (கற்புடையபெண் அமிர்து..)
2. பா.எண்: 20 (பூவாதுகாய்க்கும்.....)
3. பா.எண்: 26 (அறம்நட்டான்)
4. பா.எண்: 61 (நீரறம்நன்று....)
5. பா.எண்: 64 (குளம் தொட்டுக்காவுபதித்து...)

#### ஆசாரக்கோவை 5 பாடல்கள்

1. பா.எண்: 02 (பிறப்பு நெடுவாழ்க்கை...)
2. பா.எண்: 16 (அரசன் உபாத்தியாயன்...)
3. பா.எண்: 76 (விரைந்துரையார்...)
4. பா.எண்: 88 (உதவிப்பயன் உரையார்...)
5. பா.எண்: 96 (நந்தெறம் புதூக்கணம்...)

#### ஏலாதி 5 பாடல்கள்

1. பா.எண்: 04 (இடர்தீர்த்தல்..)
2. பா.எண்: 21 (இளமைகழியும்...)
3. பா.எண்: 33 (பொய்யுரையான்...)
4. பா.எண்: 39 (சாவதுஎளிது...)
5. பா.எண்: 46 (களியான்கள்ஒண்ணான்..)

#### இன்னாநாற்பது 5 பாடல்கள்

1. பா.எண்: 07 (ஆற்றல் இலாதான்...)
2. பா.எண்: 10 (பொருள் உணர்வார்...)
3. பா.எண்: 18 (உரனுடையான் உள்ளம்...)
4. பா.எண்: 36 (பொருளிலான் வேளாண்மை...)
5. பா.எண்: 38 (பிறன் மனையாள்...)

#### இனியவைநாற்பது 5 பாடல்கள்

1. பா.எண்: 03 (ஏவதுமாற..)
2. பா.எண்: 05 (கொல்லாமைமுன்னிது...)
3. பா.எண்: 09 (தங்கண் அமர்படையார்...)
4. பா.எண்: 16 (கற்றார் முன் கல்வி..)
5. பா.எண்: 30 (நன்றிப்பயன் தூக்கி..)

#### Text Book(s)

- திருக்குறள் பரிமேலழகர் உரை, பழனியப்பாபிரதர்ஸ், சென்னை, நான்காம்

பதிப்பு: 1994.

- நாலடியார் உரைவளம், மூலமும் உரைகளும் அடங்கியது,முதல் பாகம்,சரசுவதிமகால் நூலகம்,முதற் பதிப்பு:1953.
- பதினெண்கீழ்க்கணக்கு (முதல் தொகுதி, இரண்டாம் தொகுதி) வெளியிடுவோர் எஸ். ராஜம் சென்னை,முதற் பதிப்பு: 1959.

### Referenc Books

- ச.வே. சுப்பிரமணியன் (ப.ஆ) : பதினெண்கீழ்க்கணக்கு நூல்கள்,மெய்யப்பன் பதிப்பகம்,சிதம்பரம், 2007.
- க.ப.அறவாணன் : அற இலக்கியக் களஞ்சியம்,தமிழ்க்கோட்டம்,அமைந்தகரை, சென்னை-29.
  - க.ப.அறவாணன் : திருவள்ளுவம்,தமிழ்க்கோட்டம்,அமைந்தகரை, சென்னை-29.
  - வ.சுப. மாணிக்கம் : வள்ளுவம்,மெய்யப்பன் பதிப்பகம்,சிதம்பரம், 2009.
  - தி. முருகரத்தினம் : தமிழ் எழுத்தியல் அன்றும் இன்றும்,மதுரைப்

பல்கலைக்கழகம்,சர்வோதய இலக்கியப் பண்ணை, மதுரை-625 001.

### Online Contents (Mooc,Swayam, Nptel, Websities etc)

- Tamil Heritage Foundation  
[www.tamilheritage.org](http://www.tamilheritage.org)<<http://www.tamilheritage.org>>
- Tamil virtualUniverity Library-  
[www.tamilvu.org/library](http://www.vitalvu.org/library)<http://www.vitalvu.org/library>
- Project Madurai – [www.projectmadurai.org](http://www.projectmadurai.org).

Tamil Books on line – [books.tamilcube.com](http://books.tamilcube.com)

<b>PG I YEAR</b>	<b>தொல்காப்பியம் - பொருளதிகாரம் - 1 முதலாம் ஆண்டு</b>	<b>PTA13</b>
<b>SEMESTER – I</b>	<b>(M.A., Tamil)</b>	<b>HRS/WEEK – 6</b>
<b>Main – III</b>		<b>CREDIT – 5</b>

அலகு– 1. அகத்திணை இயல்

அலகு– 2. புறத்திணை இயல்

அலகு– 3. களவியல்

அலகு– 4. கற்பியல்

அலகு– 5. பொருளியல்

### Text Book(s)

- தொல்காப்பியம் பொருளதிகாரம்,நச்சினார்க்கினியர் உரை,திருநெல்வேலிதென்னிந்தியசைவசித்தாந்த நூற்பதிப்புக் கழகம்,திருநெல்வேலி.



- பொருளதிகாரம், இளம்பூரணார் உரை,சைவசித்தாந்த நூற்பதிப்புக் கழகம்,சென்னை.

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[www.tamilvu.org/library](http://www.tamilvu.org/library)<http://www.vitualvu.org/library>
- Project Madurai – [www.projectmadurai.org](http://www.projectmadurai.org).
- Tamil Books on line – [books.tamilcube.com](http://books.tamilcube.com)

UG I YEAR	இக்கால இலக்கியம் முதலாம் ஆண்டு	TA101B
SEMESTER – I	(B.A., Tamil)	HRS/WEEK – 5
Main – I		CREDIT – 5

### பாடங்கள்

#### அலகு- 1 கவிதைகள் (மரபும் புதிதும்)

1.பாரதியார் - மழை (முதல் பத்துஅடிகள் மட்டும்) 2. பாரதிதாசன் - பெண்ணுலகு—கைம்மைபெண்நிலை (தலைப்புக் கவிதை) 3. சுரதா—பெருந்தலைவர் காமராசர் (துறைமுகம் நூல்) 4. முடியரசன் கவிதைகள் - மொழியுணர்ச்சி (பாரிநிலையம்சென்னை) 5.வாணிதாசன் - 1புதியஉலகம் (தொகுதி— 2 வாண்தாசன் பதிப்பகம் புதுவை) 6.மேத்தா—உயிர்ப்பாடும் ஒப்பாரி (ஆகாயத்துக்குஅடுத்தவீடுகவிதாப் பப்ளிகேசன் சென்னை) 7.அப்துல் ரகுமான் - போட்டி (ஆலாபனை,யுனிவாசல் பப்ளிகேசன் சென்னை) 8.வைரமுத்து—மரங்களைப் பாடுவேன் - (இந்தப் பூக்கள் விற்பனைக்குஅல்ல சூரியா லிடர்ச்சேர் சென்னை) 9.கண்ணதாசன் - கம்பகூத்திரம் (கவிஞர் கண்ணதாசன் கவிதைகள் ரவீந்தரன் (தொ) சாகித்யஅகாடெமி) 10.இ.ரா.மீனாட்சி—காற்றோகாற்று (சுடுபூக்கள் சாரல் வெளியீடுசென்னை)

பாரதிதாசன் - சஞ்சீவிபர்வதத்தின் சாரல்

#### அலகு- 2 சிறுகதை

- 1.அன்பளிப்பு –கு.அழகிரிசாமி
- 2.நினைவுப்பாதை—புதமைப்பித்தன்
- 3.நாற்காலி—கி.ராஜநாராயணன்
- 4.மனிதாபிமானம் - தி.ஜானகிராமன்

- 5.வலை –பாவண்ணன்
- 6.அந்தி–பாமா
- 7.காகித உறவு–சு.சமுத்திரம்

பாடநூல்:உதயம் சிறுகதைத் தொகுப்பு,பிரசாடப்பள்ளிகேஷன் சென்னை

**அலகு- 3 புதினம்**

- 1.சு.தமிழ்ச்செல்வி –கீதாரி (புதினம்) (NBH Chennai)

**அலகு- 4 நாடகம்**

- 1.ஒளவை - இன்குலாப்

**அலகு- 5 உரைநடை**

- 1.கடலோடி –நரசையா

**பாடப் புத்தகங்கள்**

- 1.பாரதியார் கவிதைகள்,மணிவாசகர் பதிப்பகம்,சென்னை
- 2.பாரதிதாசன் கவிதைகள்,மணிவாசகர் பதிப்பகம்,சென்னை
- 3.சுரதா துறைமுகம்,சுவேதாபதிப்பகம்,சென்னை
- 4.முடியரசன் கவிதைகள்,பாரிநிலையம்,சென்னை
- 5.ஒளவை (நாடகம்), இன்குலாப்,அன்னம்,அகரம் பதிப்பகம்
- 6.கடலோடி (கட்டுரைகள்),நரசையா,வாசகர் வட்டம்,சென்னை

**பார்வை நூல்கள்:**

- 1.புதிய உரைநடை,மா.ராமலிங்கம்
- 2.தமிழ் நாவல் இலக்கியம்,கலாநிதிகைலாசபதி
- 3.மேலை நோக்கில் தமிழ்க்கவிதை,உலகத்தமிழாராய்ச்சிநிறுவனம்,ப.மருதநாயகம்
- 4.உலகத் தமிழ் இலக்கியவரலாறு,உலகத்தமிழாராய்ச்சிநிறுவனம், இராம.குருநாதன்
- 5.புதுக்கவிதையின் மாற்றமும் வளர்ச்சியும்,வல்லிக்கண்ணன்
- 6.தமிழ்நாவல்கள் ஒருமதிப்பீடு,நா.வானமாமலை
- 7.தமிழில் சிறுகதையின் மாற்றமும் வளர்ச்சியும்,கா.சிவத்தம்பி
- 8.நாடகக்கலைநினைவுகள்,உலகத்தமிழாராய்ச்சிநிறுவனம்,பம்பல் சம்பந்தமுதலியார்

[www.tamilvu.com](http://www.tamilvu.com)

[www.noolagam.com](http://www.noolagam.com),

[www.maduraiproject.com](http://www.maduraiproject.com), [www.tamilnation.org](http://www.tamilnation.org)

<b>UG I YEAR</b>	<b>புறப்பொருள் வெண்பாமாலை முதலாம் ஆண்டு</b>	<b>TA102B</b>
<b>SEMESTER – I</b>	<b>(B.A., Tamil)</b>	<b>HRS/WEEK – 5</b>
<b>Main – II</b>		<b>CREDIT – 5</b>

**பாடங்கள்**

**அலகு - 1.** வெட்சிப் படலம்,கரந்தைப் படலம்

**அலகு - 2.**வஞ்சிப் படலம்,காஞ்சிப் படலம்

அலகு - 3.நொச்சிப் படலம்,உழிஞைப் படலம்

அலகு - 4.தும்பைப் படலம்,வாகைப் படலம்

அலகு - 5.பாடாண் படலம்,பொதுவியல் படலம்

பாடநூல்:

1. இராமநாதன்,சுப.(ப.ஆ) 2003,புறப்பொருள் வெண்பாமாலை,அண்ணாமலைப் பல்கலைக்கழகம்

பார்வைநூல்கள்

1. பசுபதி.இம.வே.(ப.ஆ),புறப்பொருள் வெண்பாமாலை,உ.வே.சா.நூலகம்,சென்னை

2. சோ.ந.கந்தசாமி,புறத்திணைவாழ்வியல்,தஞ்சைப் பல்கலைக் கழகம்,தஞ்சை.

3. அருளம்பலவனார் உரை,புறப்பொருள் வெண்பாமாலை

4. முனைவர்.சுபாசுந்திரபோஸ்,புறப்பொருள் வெண்பாமாலைஉரை, இயல் வெளியீடு,தஞ்சாவூர்

5.முனைவர்ச.திருஞானசம்பந்தம்,புறப்பொருள் வெண்பாமாலைஉரை,கதிர் பதிப்பகம்,திருவையாறு.

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<b>UG I YEAR</b>	<b>நன்னூல் - எழுத்ததிகாரம் முதலாம் ஆண்டு</b>	<b>CODE:TA204B</b>
<b>SEMESTER – II</b>	<b>(B.A., Tamil)</b>	<b>HRS/WEEK – 6</b>
<b>Main – II</b>		<b>CREDIT – 5</b>

அலகு 1. எழுத்தியல்

அலகு 2. பதவியல்

அலகு 3. உயிரீற்றுப் புணரியல்

அலகு 4. மெய்யீற்றுப் புணரியல்

அலகு 5. உருபுபுணரியல்

பாடநூல் :1. நன்னூல் - எழுத்ததிகாரம் காண்டிகைஉரை,முனைவர் ச. திருஞானசம்பந்தம்,கதிர் பதிப்பகம்,திருவையாறு.

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<b>YEAR – I B.A HISTORY</b>	<b>INTRODUCTION TO ARCHAEOLOGY</b>	<b>EHI101A</b>
<b>SEMESTER - II</b>		<b>HRS/WK - 6</b>
<b>CORE - VII</b>		<b>CREDIT - 3</b>

<b>Learning Objectives</b>	
<b>S. No.</b>	<b><i>The course objectives are to impart:</i></b>
1	Meaning of archaeology, kinds of archaeology and its relations with allied disciplines.
2	Archaeological developments in the world and India.
3	Knowledge of early archaeologists and the status of archaeological studies.
4	Understanding of the methods and techniques of archaeology.
5	Interpretation of excavated materials

#### **UNIT I**

Definition, Nature, Aim and Scope of Archaeology - Archaeology as a Source of Cultural Studies- Different kinds of Archaeology - Marine Archaeology, Aerial Archaeology, New Archaeology - Archaeology and its relations with allied disciplines

#### **UNIT II**

Beginnings in Archaeology from Antiquarianism to Archaeology - Process of Archaeology in the West - Growth of Archaeology in India- Archaeological Survey of India.

#### **UNIT III**

Archaeological Studies – Educational Institutions - Early Archaeologists in India –Robert Bruce Foote – Alexander Rae – Alexander Cunningham, Sir John Marshall, Sir Mortimer Wheeler, Jean Mariacastle, H.D.Sankalia.

#### **UNIT IV**

Exploration- Aims –Methods - Manual and Scientific Excavation – Methods of Excavation – Vertical, Horizontal, Quadrant Method, Underwater Archaeology; Stratigraphy: Definition, Scope and Methodology; Recording Methods: Photography, Plan and Section Drawing, Three Dimensional Measurements; Dating Methods: Absolute Dating Methods: Radio Carbon and AMS Dating – Thermo luminescence and OSL Dating – Potassium Argon – Uranium Series – Fission Track – Electronic Spin Resonance – Dendrochronology – Relative Dating: Flouing Method – Nitrogen Method – Varve Analysis – Stratigraphy – Seriation – Historical Dating

## UNIT V

Interpretation of Excavated Materials - Classification of Artifacts - Contextual and Site Catchment Analysis; Pottery and Antiquities: Description and Analysis - Scientific Analysis of Organic Materials.

Archaeological excavations in Tamil Nadu – Arikamedu – Adichanallur – Korkai – Keezhadi – Mayiladumparai – Sivagalai – other sites

### LEARNING RESOURCES Recommended Books

K. Rajan, *Archaeology: Principles and Methods*, ManooPathippakam, Thanjavur, 2002

K. Rajan, *Understanding Archaeology: Field Methods, Theories and Practices*, ManooPathippakam, Thanjavur, 2016

K.V. Raman, *Principles and Methods of Archaeology*, Parthajan Publications, Madras, 1986

### References

B.D. Dillon, ed., *Practical Archaeology: Field and Laboratory Techniques and Archaeological Logistics*, Institute of Archaeology, University of California, Los Angeles, 1989

Stuart Fleming, *Dating in Archaeology: A Guide to Scientific Techniques*, J.M. Dent, London 1978

Robert F. Heizer, (ed.), *The Archaeologist at Work: A Source Book in Archaeological Method and Interpretation*, Harper & Row, New York, 1969

C. Renfrew & Paul Bahn, *Archaeology: Theories, Methods and Practice*, Thames & Hudson, London, 2012

Surendranath Roy, *The Story of Indian Archaeology 1784-1947*, Archaeological Survey of India, New Delhi, 2011 **Web Resources** <http://www.arch.cam.uk> <http://archaeological.org>  
<http://www.tnarch.gov.in> <https://radiocarbon.com>

CO No.	Course Outcomes <i>The students on completion of the course will be able to:</i>	Cognitive Level
CO 1	Define archaeology and explain different kinds of archaeology.	K1, K2
CO 2	Trace the archaeological developments from its beginnings.	K1
CO 3	Describe the contribution of early archaeologists in India	K1
CO 4	Explain the methods and techniques of archaeology.	K2
CO 5	Classify the artefacts and describe the various types of analysis.	K4

### CO Mapping with Programme Outcomes

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO 1	3	3	3	3	2	3	2	3

<b>CO 2</b>	3	3	3	3	3	3	2	3
<b>CO 3</b>	3	3	3	3	3	3	3	3
<b>CO 4</b>	3	3	3	3	2	2	2	3
<b>CO 5</b>	3	3	3	3	3	3	3	3
<b>Total</b>	15	15	15	15	13	14	12	15
<b>Average</b>	3	3	3	3	2.6	2.8	2.4	3

**S-Strong (3)**

**M-Medium (2)**

**L-Low (1)**

**CO Mapping with Programme Specific Outcomes**

	<b>PSO 1</b>	<b>PSO 2</b>	<b>PSO 3</b>	<b>PSO 4</b>	<b>PSO 5</b>
<b>CO 1</b>	3	3	2	3	3
<b>CO 2</b>	3	3	3	3	3
<b>CO 3</b>	3	3	3	3	3
<b>CO 4</b>	3	3	3	3	3
<b>CO 5</b>	3	3	3	3	3
<b>Total</b>	15	15	14	15	15
<b>Average</b>	3	3	2.8	3	3

**S-Strong(3)**

**M-Medium (2)**

**L-Low (1)**

<b>YEAR - I B.A HISTORY</b>	<b>INTRODUCTION TO HISTORY</b>	<b>FHI101</b>
<b>SEMESTER - I</b>		<b>HRS/WK - 2</b>
<b>CORE - IV</b>		<b>CREDIT - 3</b>

#### Objectives

- 1: To learn about the definition Travel Agency and hospitality Management.
- 2: To make the students to understand the Visa, Passport, Emigration, and Regulation of country.
- 3: To let the students aware of Travel Agencies, bank exchanging and Relation Supports of Tourist development in India.

#### Course Outcome (CO)

**CO1:** Students will demonstrate knowledge of the growth of travel agencies in India.

**CO2:** Students will corrently extract evidence from primary sources by analyzing and understanding the concepts of banking exchange, regulation of passport and visa.

**CO3:** Students will evaluate primary sources like hospitality management like as well as travel agencies by analyzing them in relation to the that supports them their tourist development.

SEMESTER :I	COURSE CODE : FHI101					COURSE TITLE: INTRODUCTION TO HISTORY					HOURS: 2
COURSE OUTCOME (COs)	PROGRAMME OUTCOMES (POs)					PROGRAMME SPECIFIC OUTCOMES (PSOs)					CREDIT :3
CO	P O 1	P O 2	P O 3	P O 4	P O 5	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	MEAN SCORE OF CO'S
CO 1	2	3	1	3	3	2	3	3	2	3	2.60
CO 2	3	2	3	3	2	3	3	3	3	3	2.80
CO 3	2	3	2	3	1	2	3	2	3	2	2.30
CO 4	1	3	2	3	2	2	3	2	2	3	2.40
<b>MEAN OVERALL SCORE</b>											<b>2.52</b>

**CO4:** Students will acquire the knowledge of the accommodation, travel agencies and history of tourism.

*Result: The Score of the course is 2.52 (Moderate)*

Association	1% -20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

UNIT I



History – Meaning & Definitions – Nature and Scope of History – Uses and Abuses of History – Lessons in History

#### UNIT II

Kinds of History – History and Allied Disciplines – Debates on history: Science or an Art

#### UNIT III

Herodotus – Thucydides – Livy – Tacitus – St. Augustine – Ibn Khaldun – Alberuni – Voltaire – Ranke – Hegel – Marx – Antonio Gramsci – Michel Foucault – E.H. Carr

#### UNIT IV

Jadunath Sarkar – R.C. Majumdar – D.D. Kosambi – Romila Thapar – R.S. Sharma – Irfan Habib – Bipan Chandra – Ranajit Guha P.T. Srinivasa Iyyengar – C.S. Srinivasachari – K.A. NilakantaSastri – K.K. Pillai-N. Subramanian – K.A. Rajayyan – G. Venkatesan

#### UNIT V

Repositories of Sources: Archaeological – Epigraphical – Numismatic – Material Remains – Literary – Oral Sources – Archival and Government Records – Use of Footnotes and Bibliography in writing assignments.

**Field Visit** – Nearest archaeological/historical site, museum, archives and libraries

### **Field Report**

## **LEARNING RESOURCES**

#### Recommended Books

E. Sreedharan, A Textbook of Historiography, 500 BC to AD 2000, Orient Longman, New Delhi, 2004 E.H.

- Carr, What is History?, Penguin Books Ltd., New Delhi, 2018.
- G. Venkatesan, A Study of Historiography (History of Historical Knowledge), V.C. Publications, 2018
- K. Rajayyan, History in Theory and Method: A Study in Historiography, Raj Publications, Madurai, 1982
- S. Manikam, On History & Historiography, Paduman Publishers, Madurai
- SheikAli, History: Its Theory and Method, Laxmi Publications, 2019 References
- John C.B. Webster, Studying History, Primus Books, Delhi, 2019
- Marc Bloch, The Historian's Craft, Aakar Books, Delhi, 2017
- R.C. Collingwood, The Idea of History, OUP, Delhi, 1994
- Romila Thapar, History and Beyond, Taylor and Francis, Oxford University of Press,

#### **Web Resources**

<https://archives.history.ac.uk/history-in-focus/Whathistory/index.html>

<http://d-nb.info>

<b>YEAR - I B.A HISTORY</b>	<b>HISTORY OF ANCIENT INDIA UP TO 1206 CE</b>	<b>HI101A</b>
<b>SEMESTER - I</b>		<b>HRS/WK - 5</b>
<b>CORE - I</b>		<b>CREDIT - 4</b>

## Objectives

1. To create awareness regarding Historical perspectives on the Indus Valley Civilization during the period 1206 AD.
2. To create awareness regarding the Social Religious on the history of India during 1206 AD.
3. To impart knowledge on the Cultural influences of Vedic Period on the Indian Society on political, social, economic and cultural aspects during 1206 AD.

## Course outcome (CO)

**CO1:** Students will demonstrate knowledge of the chronology of ancient India.

**CO2:** Students will correctly extract evidence from primary sources by analyzing and understanding the ancient state system to modern state system.

**CO3:** Students will evaluate primary historical sources like inscription like as well as literature by analyzing them in relation to the evidence that supports them their theoretical frameworks, and other secondary historical literature.

**CO4:** Students will acquire the knowledge of the civilization of ancient people of the study period.

SEMESTER I	COURSE CODE : HI101A					COURSE TITLE: HISTORY OF ANCIENT INDIA UP TO 1206 CE					HOURS: 5
COURSE OUTCOME (CO <sub>s</sub> )	PROGRAMME OUTCOMES (PO <sub>s</sub> )					PROGRAMME SPECIFIC OUTCOMES (PSO <sub>s</sub> )					CREDIT :4
CO	P O 1	P O 2	P O 3	P O 4	P O 5	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	MEAN SCORE OF CO'S

CO 1	2	3	3	3	3	2	3	3	2	3	2.70
CO 2	3	2	3	3	3	3	3	3	3	3	2.90
CO 3	2	3	2	2	1	2	3	2	3	2	2.20
CO 4	1	3	2	3	3	2	3	2	2	3	2.40
	<b>MEAN OVERALL SCORE</b>										<b>2.55</b>

Result: The Score of the course is 2.55 (Moderate)

Association	1% -20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

#### UNIT I

Geographical Features – Sources of Indian History – Pre- and Proto History – Harappan Civilization – Megalithic Culture – Ancient Tamil Civilization – Early Vedic Age – Later Vedic Age.

#### UNIT II

Buddhism and Jainism – Greek and Persian Invasions of India – Alexander’s Invasion – Rise of Mahajanapadas – Magadhan Empire – Nandas – Mauryas – Chandragupta Maurya – Asoka – Mauryan Administration – Art and Architecture.

#### UNIT III

Satavahanas - Kushanas – Kanishka-I – Gupta Empire – Chandragupta Vikramaditya – Samudragupta – Kumara Gupta – Administration – Social, Economic and Cultural Developments – Vakatakas – Nalanada, Vikramasila and Valabhi Universities.

## UNIT IV

Vardhanas – Harshavardhana – Administration – Religious Contributions – Provincial Dynasties – Chalukyas – Rashtrakutas – Paramaras – Palas – Senas – Art and Architecture – Cultural contributions. **UNIT V** Rajputs – Cultural Contributions – Arab Conquest of Sind – Mahmud of Ghazni – Invasions – Mohammed of Ghor – Battles of Tarain.

### LEARNING RESOURCES

#### *Recommended Books*

- G. Venkatesan, Cultural History of India, Varthamanan Pathipagam, 2018 (in Tamil)
- K.L. Khurana, History of India: Earliest times to 1526 A.D., Lakshmi Narain Agarwal, Agra
- L.P. Sharma, History of Ancient India, Konark Pub. Pvt. Ltd., New Delhi, 2008
- R.C. Majumdar, et. al., An Advanced History of India, MacMillan, Delhi, 1974
- R.S. Sharma, India's Ancient Past, Oxford University Press, New Delhi, 2017
- RanabirChakravarti, Exploring Early India up to c. AD 1300, Primus Books, New Delhi, 2016
- Romila Thapar, The Penguin History of Early India: From the origin to A.D. 1300, Penguin Books, New Delhi, 2002
- Upinder Singh, A History of Ancient and early Medieval India, Pearson and Longman, Delhi, 2008

#### *Referances*

- A.L. Basham, The Wonder that was India, London, Macmillan, 2004
- B.N. Luniya, Evolution of Indian Culture, Agra, Lakshmi Narain Publication, 2005
- K.K. Pillay, A Social History of the Tamils, University of Madras, 1967
- K.K. Pillay, Historical Heritage of Tamils, MJP Publishers, Chennai, 2021
- K.K. Pillay, Studies in Indian History: With Special Reference to Tamil Nadu, K.K. Pillay, Madras, 1979
- R. Sathianathaier, Political and Cultural History of India, Vol. I, Viswanathan & Co., Chennai, 1980. **Web Resources**

<https://archive.org/details/in.ernet.dli.2015.279506/page/n1/mo>

[de/2 up](#)

<b>YEAR - I B.A HISTORY</b>	<b>HISTORY OF TAMIL NADU UP TO 1311 CE</b>	<b>HI102A</b>
<b>SEMESTER - I</b>		<b>HRS/WK - 5</b>
<b>CORE - II</b>		<b>CREDIT - 4</b>

*Obj  
ective  
s*

1. To learn about the definition, meaning, scope and types of tourism
2. To make the students to understand the antiquity of tourism  
in  
India from the early days, Tourists  
produces available.
3. To let the students aware of negative impact of Tourism on the  
Heritage Cultural Monuments and the ecological challenges thus  
faced.

*Course Outcome (CO)*

**CO1:** Know the History of Tourism in India from the rudimentary stage. **CO2:** Understand the basics of Tourism as an Industry with much prospects of employment.

**CO3:** Realise the Historical and Cultural Glories of Tamil Nadu through Art and Architecture, Fairs and festivals which are of major Tourism potential.

**CO4:** Voice against the adverse effects of Tourism like Human Vandalism and Cultural and Environmental Challenges.

SEMESTER : I	COURSE CODE : HI102A					COURSE TITLE: HISTORY OF TAMIL NADU UP TO 1311 CE					HOURS: 5
COURSE OUTCOME (COs)	PROGRAMME OUTCOMES (POs)					PROGRAMME SPECIFIC OUTCOMES (PSOs)					CREDIT :4
CO	P O 1	P O 2	P O 3	P O 4	P O 5	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	MEAN SCORE OF CO'S
CO 1	2	3	1	3	3	2	3	3	2	3	2.50
CO 2	3	1	3	3	2	3	3	3	3	3	2.70
CO 3	2	3	2	2	1	2	3	2	3	2	2.20
CO 4	2	3	2	3	3	2	3	2	2	3	2.50
<b>MEAN OVERALL SCORE</b>											<b>2.47</b>

*Result: The Score of the course is 2.47 (Moderate)*

Association	1% -20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

## **UNIT I**

Geography – Sources for the study of history of Tamil Nadu – pre & Proto history of Tamil Nadu – Ancient Tamil Civilization.

## **UNIT II**

Sangam Age – Historicity – Early Cholas – Karikala – Cheras – Senguttuvan – Pandyas – Neduchezhin – Polity – Society – Economy – Foreign Trade – Religion – Literature – Kalabhara Interregnum – Impact of their rule.

## **UNIT III**

The Pallavas – Origin: Early Pallavas – Later Pallavas – Political, Social and

Economic Conditions – Growth of Literature and Education – Art and

Architecture – Sculpture – Paintings & Fine arts – Early Bakthi Movement – The First Pandyan Empire – Sources – Triangular conflict between Pallavas, Pandyas and Western Chalukyas – Administration – Art and Architecture

## **UNIT IV**

Later Cholas: Raja Raja Chola I – Rajendra Chola I – Overseas Expansion – Kulothunga – Chalukya – Chola relations – Administrative System – Land

Grants and Temple Administration – Social and Economic life – Maritime Trade & Commerce – Religion – Literature – Art and Architecture – Bronze Sculptures

## **UNIT V**

The Second Pandyan Empire (1190-1312 CE) – Triangular conflict among Cholas, Pandyas and Hoysalas – Social and Economic Life – Malik Kafur's Invasion

## **LEARNING RESOURCES Recommended**

### **Books**

A. Ramasamy, A History of Ancient Tamil Civilization, New Century Book House, Chennai

B. Eriayarasan, The History of Tamil Nadu (The Only Surviving Classical Civilization), International Institute of Tamil Studies, Chennai, 2017

K.A. NilakantaSastri, A History of South India: From Prehistoric Times to the Fall of Vijayanagar, Oxford University Press, Chennai, 1997



- N. Subramanian, History of Tamilnad, Koodal Publishers, Madurai, 1997
- Noboru Karashima, ed., A Concise History of South India: Issues and Interpretations, Oxford University Press, New Delhi, 2014
- V.T. Chellam, New Light on the Early History of Tamil Nadu, Vijay Publications, Trichy, 1981
- V.T. Chellam, Tamil Nadu: History and Culture (in Tamil), Manivasagar Pathipakam, 2016

### **References**

- AvvaiDuraisamy Pillai, History of the Chera King, Saran Books, Chennai, 2020
- C. Minakshi, Administration and Social Life Under the Pallavas, University of Madras, Madras, 1938
- K.A. NilakantaSatri, The Colas, University of Madras, Madras, 1984
- K.K. Pillay, A Social History of the Tamils, University of Madras, Madras, 1967
- K.K. Pillay, Historical Heritage of Tamils, MJP Publishers, Chennai, 2021
- K.K. Pillay, Studies in Indian History: With Special References to Tamil Nadu, K.K. Pillay, Madras, 1979
- Ma. Rajamanickanar, History of Cholas, Saran Books, Chennai
- Ma. Rajamanickanar, History of Pallavas, Saran Books, Chennai
- N. Subramanian, Sangam Polity, Asia Publishing House, Bombay, 1966
- P.T. Srinivasa Iyengar, History of the Tamils: From the Earliest Times to 600 A.D., Asian Educational Services, New Delhi, 2001
- V. Kanakasabhai, Tamils Eighteen Hundred Years Ago, Asian Educational Service, New Delhi, 1982
- Y. Subbarayalu, South India under the Cholas, Oxford University Press, New Delhi, 2012 Web Resources  
<https://www.tamildigitallibrary.in/bookdetail.php?id=jZY9lup2kZ16TuXGZQdjZt91Jpd#book1/> <http://www.historydiscussion.net>

<b>YEAR - I B.A HISTORY</b>	<b>INTRODUCTION TO TOURISM</b>	<b>NHI101</b>
<b>SEMESTER - I</b>		<b>HRS/WK - 2</b>
<b>CORE - V</b>		<b>CREDIT - 4</b>

#### Objectives

- 1: To learn about the decline of Mughal Rule in India, settlements of Europeans and Establishment of British Power and the efforts taken by company to expand and consolidate its rule in India.
- 2: To acquire knowledge about subsidiary Alliance, Doctrine of Lapse and Mutiny 1857.
- 3: To aware of the reforms introduced by Warren Hastings, Cornwallis, Willaiam Buntink, enunciated, progress in Business, administration, education, transport and social brought in by the ancient administrators.

#### Course Outcome (CO)

- CO1:** Understand about the political condition that prevailed in India during the decline of Mughal rule, Judiciary advent of Europeans.
- CO2:** Know about the diversified ambitions of Europeans in India to colonise and their subsequent success in wars achieving their goal.
- CO3:** Acquire knowledge about the various reforms administrative measures taken by the company through its Governor Generals in a bid to consolidate their military grains.
- CO4:** Trace the religious reforms, educational reforms, judicial reforms, reforms in Transport and communication and on the subsequent outbreak of Mutiny.

SEMESTER I	COURSE CODE NHI101					COURSE TITLE: INTRODUCTION TO TOURISM					HOURS: 2
COURSE OUTCOME (CO <sub>s</sub> )	PROGRAMME OUTCOMES (PO <sub>s</sub> )					PROGRAMME SPECIFIC OUTCOMES (PSO <sub>s</sub> )					CREDIT :4
CO	P O 1	P O 2	P O 3	P O 4	P O 5	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	MEAN SCORE OF CO'S
CO 1	3	3	2	3	2	2	2	3	2	3	2.50
CO 2	3	1	3	2	2	3	3	3	3	3	2.50
CO 3	3	3	3	2	3	3	2	3	3	2	2.70
CO 4	3	3	2	2	3	3	2	3	3	3	2.70
	<b>MEAN OVERALL SCORE</b>										<b>2.60</b>

*Result: The Score of the course is 2.60 (Moderate)*

Association	1% -20%	21%-40%	41%-60%	61%-80%	81%- 100%
Scale	1	2	3	4	5
Interval	0<=rating g<=1	1.1<=rating <=2	2.1<=rating g<=3	3.1<=rating g<=4	4.1<=rating g<=5
Rating	Very Poor	Poor	Moderate	High	Very High

#### UNIT I

Concepts of Tourism: Definition of Tourism –  
Traveller – Tourist –

Excursionist – Travel Motivations: Push and Pull  
Motivations of

Travel – Basic Components of Tourism: Transport,  
Attraction,

Accommodation – Elements of Tourism: Weather,  
Amenities, Accessibility, Historical and Cultural  
Factors

#### UNIT II

## Types and Forms of Tourism: Domestic and International Tourism

– Long Haul and Short Haul Tourism – Leisure Tourism

–

Pilgrimage Tourism – Special Interest Tourism –  
Adventure

Tourism – Eco Tourism – Cultural Tourism – Desert  
Tourism –

Agro Tourism – Culinary Tourism – Medical Tourism –  
Sustainable Tourism

### UNIT III

## Travel Agency : Meaning of Travel Agent – Types of Travel Agency –

Roles of Large Travel Agent – Characteristics of a  
Professional Travel Agent

### UNIT IV

## Tour Operator: Meaning of Tour Operator – Types of Tour Operator

: Inbound, Outbound, Domestic, Ground and Specialized  
– Role of Tour Operators – Itinerary

Planning: Principles, Resources and Guidelines

### UNIT V

## Travel Documents: Passport – VISA – Health Certificates – Tax –

Customs – Currency – Travel Insurance – Role of  
Information

Technology in Tourism related Services –  
Computerized

Reservation System (CRS) and Global Distribution  
System (GDS)

## **LEARNING RESOURCES**

### Recommended Books

A.K. Bhatia, Tourism Management, Sterling  
Publications, New Delhi, 2016

A.K. Bhatia, The Business of Travel Agency and Tour  
Operations Management, Sterling Publications, New  
Delhi, 2014

### References

Marc Mancini, Conducting Tours: A Practical Guide,

Cengage Learning Publications, New Zealand, 2000  
J. Negi, Travel Agency and Tour Operation: Concepts  
and Principles, Kanishka Publisher, New Delhi,  
2004

Pran Nath Seth, Successful Tourism Management:  
Fundamentals of Tourism, Sterling Publications,  
New Delhi, 2008

**Web Resources**

[http://www.academia.edu/14264572/Basic Concepts on  
Tourism](http://www.academia.edu/14264572/Basic_Concepts_on_Tourism) <http://bieap.gov.in/Pdf/TTPaperIIYR2.pdf>

## SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS

<b>I-B.Sc.(MATHS)</b>	<b>ALGEBRA AND TRIGONOMETRY</b>	<b>MT101A</b>
<b>SEMESTER-I</b>	<b>For the students admitted from the year 2023</b>	<b>HRS/WK – 5</b>
<b>CORE-I</b>		<b>CREDIT – 5</b>

### OBJECTIVES

Basic ideas on the Theory of equations, Matrices and Number Theory. Knowledge to find expansions of trigonometry functions, solve theoretical and applied problems.

### COURSE OUTCOME:

At the end of the course students will be able to

CO1: Classify and Solve reciprocal equations.

CO2: Find the sum of binomial, exponential and logarithmic series.

CO3: Find Eigen values, Eigen vectors, verify Cayley – Hamilton theorem and diagonalize a given matrix

CO4: Expand the powers and multiples of trigonometric functions in terms of sine and cosine.

CO5: Determine relationship between circular and hyperbolic functions and the summation of trigonometric series

SEMESTER I	COURSE CODE: MT101A	COURSE TITLE: ALGEBRA AND TRIGONOMETRY										HOURS 5	CREDITS 5			
COURSE OUTCOMES	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)										MEAN SCORE OF CO'S
	P O 1	P O 2	P O 3	P O 4	P O 5	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	P S O 6	P S O 7	P S O 8	P S O 9	P S O 10	
CO1	3	4	4	3	3	4	5	5	2	4	3	5	2	3	4	3.6
CO2	3	4	3	3	3	4	5	5	2	4	3	5	2	2	4	3.46
CO3	3	4	4	3	3	4	4	5	2	4	3	5	2	2	4	3.46
CO4	3	4	4	3	3	4	5	5	2	4	3	5	3	2	4	3.6
CO5	3	4	3	3	3	4	5	5	2	4	3	5	2	2	4	3.46
Mean Overall Score															3.5	

Result: This Score of this course is 3.5 (High)

This Course is having **HIGH** association with Programme Outcomes and Programme Specific

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	$0 \leq \text{rating} \leq 1$	$1.1 \leq \text{rating} \leq 2$	$2.1 \leq \text{rating} \leq 3$	$3.1 \leq \text{rating} \leq 4$	$4.1 \leq \text{rating} \leq 5$
Rating	Very Poor	Poor	Moderate	High	Very High

Outcome.

## **SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS**

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### **UNIT I: THEORY OF EQUATIONS**

Reciprocal Equations-Standard form-Increasing or decreasing the roots of a given equation-Removal of terms, Approximate solutions of roots of polynomials by Horner's method – related problems.

### **UNIT II: SUMMATION OF SERIES**

Binomial– Exponential –Logarithmic series (Theorems without proof) – Approximations - related problems.

### **Unit III: MATRICES**

Characteristic equation – Eigen values and Eigen Vectors-Similar matrices - Cayley – Hamilton Theorem (Statement only) - Finding powers of square matrix, Inverse of a square matrix up to order 3, Diagonalization of square matrices - related problems.

### **Unit IV: TRIGONOMETRY**

Expansions of  $\sin n\theta$ ,  $\cos n\theta$  in powers of  $\sin\theta$ ,  $\cos\theta$  - Expansion of  $\tan n\theta$  in terms of  $\tan\theta$ , Expansions of  $\cos^n\theta$ ,  $\sin^n\theta$ ,  $\cos^m\theta \sin^n\theta$  –Expansions of  $\tan(\theta_1+\theta_2+\dots, +\theta_n)$ -Expansions of  $\sin\theta$ ,  $\cos\theta$  and  $\tan\theta$  in terms of  $\theta$  - related problems.

### **UNIT V: TRIGONOMETRY (continued)**

Hyperbolic functions – Relation between circular and hyperbolic functions Inverse hyperbolic functions, Logarithm of complex quantities.

### **TEXT BOOKS:**

1. T. K. Manicavachagom Pillay, T. Natarajan and K.S. Ganapathy [2004], “Algebra”,  
Volume I & II. S. Viswanathans Printers Pvt. Ltd. Chennai.  
Unit I: Theory of equations-Chapter 6 (Sec 9 – 13, 15, 16, 25, 26)  
Unit II: Summation of Series- Chapter 4 (Sec 2, 3, 5 - 9),  
Unit III: Matrices -Chapter 2 (16)
2. T. K. Manicavachagom Pillay, T. Natarajan and K.S. Ganapathy [2004], “Trigonometry”,  
Volume I & II S. Viswanathans Printers Pvt. Ltd. Chennai.  
Unit IV: Trigonometry-Chapter 3  
Unit V: Trigonometry (contd..)-Chapter 4 & Chapter 5 (Sec-5)

## **SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS**

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### **REFERENCE BOOKS:**

1. W.S. Burnstine and A.W. Panton, Theory of equations
2. David C. Lay, Linear Algebra and its Applications, 3rd Ed., Pearson Education Asia, Indian Reprint, 2007
3. G.B. Thomas and R.L. Finney, Calculus, 9th Ed., Pearson Education, Delhi, 2005
4. C. V. Durell and A. Robson, Advanced Trigonometry, Courier Corporation, 2003
5. J. Stewart, L. Redlin, and S. Watson, Algebra and Trigonometry, Cengage Learning, 2012.
6. G.B. Thomas and R. L. Finny, Calculus and Analytical Geometry, Pearson Publication, 9<sup>th</sup> Edition, 2010.



## SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS

<b>I – B.Sc. (Maths)</b>	<b>DIFFERENTIAL CALCULUS</b> For the students admitted from the year 2023	<b>MT102A</b>
<b>SEMESTER – I</b>		<b>HRS/WK – 5</b>
<b>CORE – II</b>		<b>CREDIT – 5</b>

### OBJECTIVES:

The basic skills of differentiation, successive differentiation, and their applications. Basic knowledge on the notions of curvature, evolutes, involutes and polar co-ordinates and in solving related problems.

### COURSE OUTCOMES:

At the end of the Course the students will be able to

CO1: Find the nth derivative, form equations involving derivatives and apply Leibnitz formula

CO2: Find the partial derivative and total derivative coefficient

CO3: Determine maxima and minima of functions of two variables and to use the Lagrange's method of undetermined multipliers

CO4: Find the envelope of a given family of curves

CO5: Find the evolutes and involutes and to find the radius of curvature using polar co-ordinates

SEMESTER I	COURSE CODE: MT102A	COURSE TITLE: DIFFERENTIAL CALCULUS	HRS 5	CREDITS 5													
COURSE OUTCOMES	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)										MEAN SCORE OF CO'S	
	P O 1	P O 2	P O 3	P O 4	P O 5	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	P S O 6	P S O 7	P S O 8	P S O 9	P S O 10		
CO1	4	4	3	4	3	2	5	4	3	4	3	4	2	2	4	3.3	
CO2	3	4	3	3	2	2	5	3	2	3	3	4	2	3	4	3.1	
CO3	4	3	2	3	2	3	4	5	2	4	4	5	3	2	3	3.3	
CO4	3	4	2	2	3	2	5	3	2	3	2	4	2	3	2	2.8	
CO5	4	5	3	2	2	3	5	3	3	3	4	5	2	3	3	3.5	
Mean Overall Score															3.2		

Result: This Score of this course is 3.2 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very poor	Poor	Moderate	High	Very High

This course is having **HIGH** association with programme outcomes and programme specific outcomes

## **SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS**

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### **UNIT-I: SUCCESSIVE DIFFERENTIATION**

Introduction (Review of basic concepts) – The  $n^{th}$  derivative – Standard results – Fractional expressions – Trigonometrical transformation – Formation of equations involving derivatives – Leibnitz formula for the  $n^{th}$  derivative of a product.

### **UNIT-II: PARTIAL DIFFERENTIATION**

Partial derivatives – Successive partial derivatives – Function of a function rule – Total differential coefficient – A special case – Implicit Functions.

### **UNIT-III: PARTIAL DIFFERENTIATION (CONTINUED)**

Homogeneous functions – Partial derivatives of a function of two variables – Maxima and Minima of functions of two variables - Lagrange's method of undetermined multipliers (Simple Problems).

### **UNIT-IV: ENVELOPE**

Method of finding the envelope – Another definition of envelope – Envelope of family of curves which are quadratic in the parameter.

### **UNIT-V: CURVATURE**

Definition of Curvature – Circle, Radius and Centre of Curvature – Evolutes and Involutives – Radius of Curvature in Polar Co-ordinates.

### **TEXT BOOKS:**

1. S. Narayanan and T. K. Manicavachagom Pillai, Differential Calculus, Volume - I, S. Viswanathan (Printers & Publishers) Pvt. Limited, Chennai, 2006  
UNIT - I: Chapters 3: Sections 1.1 – 1.6 & 2.1 (Page: 69 -87)  
UNIT - II: Chapters 8: Sections 1.1- 1.5 (Page: 178 -191)  
UNIT – III: Chapters 8: Sections 1.6 – 1.7 & 4 (Page: 191 - 204, 222 -240)  
UNIT – IV: Chapters 10: Sections 1.1 – 1.4 (Page: 281 - 291)  
UNIT –V: Chapters 10: Sections 2.1 – 2.6 (Page: 291 - 313)

### **REFERNECE BOOKS:**

1. H. Anton, I. Birens and S. Davis, Calculus, John Wiley and Sons, Inc., 2002.
2. G.B. Thomas and R.L. Finney, Calculus, Pearson Education, 2010.
3. M.J. Strauss, G.L. Bradley and K. J. Smith, Calculus, 3rd Ed., Dorling Kindersley (India) P. Ltd. (Pearson Education), Delhi, 2007.

## SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS

<b>I – B.SC. (MATHS)</b>	<b>NUMERICAL METHODS WITH APPLICATIONS</b>	<b>EMT101A</b>
<b>SEMESTER – I</b>		<b>HRS/WK – 4</b>
<b>ELECTIVE -1</b>	<b>For the students admitted from the year 2023</b>	<b>CREDIT – 3</b>

### OBJECTIVES

The course aims to introduce the concepts of Finite differences, Central differences, Interpolation for unequal intervals, Inverse interpolation and Solutions of simultaneous linear equations.

### COURSE OUTCOMES:

At the end of the course students will be able to

CO1: solve the problems in Newton's forward and backward method.

CO2: solve and analyze the difference between Gauss forward and backward, Stirling's method and Bessel's method.

CO3: certain equal intervals and unequal intervals.

CO4: determine the solutions for lineal algebraic equations.

CO5: determine the solutions for Numerical differential equations and integration.

SEMESTER I	COURSE CODE EMT101A	COURSE TITLE: NUMERICAL METHODS WITH APPLICATIONS	HOURS 4	CREDITS 3												
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)										MEAN SCORE OF CO'S
	P O 1	P O 2	P O 3	P O 4	P O 5	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	P S O 6	P S O 7	P S O 8	P S O 9	P S O 10	
CO1	3	4	4	3	3	4	5	5	2	4	3	5	2	3	4	3.6
CO2	3	4	3	3	3	4	5	5	2	4	3	5	2	2	4	3.46
CO3	3	4	4	3	3	4	4	5	2	4	3	5	2	2	4	3.46
CO4	3	4	4	3	3	4	5	5	2	4	3	5	3	2	4	3.6
CO5	3	4	3	3	3	4	5	5	2	4	3	5	2	2	4	3.46
Mean Overall Score															3.5	

Result: The Score of this Course is 3.5 (High)

This course is having **HIGH** association with programme outcomes and programme specific outcomes

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very poor	Poor	Moderate	High	Very High

## **SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS**

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### **UNIT- I: FINITE DIFFERENCES**

First and higher order differences-forward differences and Backward differences -Operators, Relation between  $\nabla, \Delta$  and  $E$  – Interpolation –Gregory- Newton’s forward & backward formulae for interpolation.

### **UNIT-II: CENTRAL DIFFERENCES**

Central difference operators – Central differences formulae- Gauss Forward and Backward formulae – Stirling’s formula – Bessel’s formula.

### **UNIT-III: INTERPOLATING FOR UNEQUAL INTERVALS AND INVERSE INTERPOLATION**

Divided differences – Newton’s divided differences formula and Lagrange’s interpolation formula – Estimating the Missing terms for equal interval [with one or more missing values] – Inverse Lagrange’s method.

### **UNIT – IV: LINEAR ALGEBRAIC EQUATIONS**

Gauss Elimination Method – Gauss Jordan Method- Gauss Seidal Method – Crout’s Method [Three unknowns only].

### **UNIT – V: NUMERICAL DIFFERENTIAL EQUATIONS AND INTEGRATION**

Euler’s method: Improved Euler’s method, Modified Euler’s method- The 4<sup>th</sup> order Runge Kutta Method for first order differential equations-Trapezoidal rule

### **TEXT BOOKS:**

1. A. Singaravelu [2004], “Numerical Methods”, Meenakshi Agency, Chennai
2. M.K. Venkataraman (1992), “Numerical Methods for Science and Engineering”, National Publishing Company, Chennai.

UNIT-I: Chapter 3: 3.1, 3.2, 3.3, 3.4, 3.5, 3.12, 3.13, 3.15

UNIT II: Chapter 3: 3.6, 3.7, 3.8, 3.9, 3.10

UNIT III: Chapter 4: 4.1, 4.2, 4.4, 4.9, 4.15

UNIT IV: Chapter 2: 2.41, 2.47, 2.52, 2.61, 2.77

UNIT V: Chapter 5: 5.12, 5.13, 5.14, 5.19, 5.54

### **REFERENCE BOOKS:**

1. S. Arumugam [2003], “Numerical Methods”, New Gamma Publishing, Palayamkottai.
2. H. C. Saxena [1991], “Finite Differences and Numerical Analysis”, S. Chand & Co. Delhi.
3. B. D. Gupta (2001), “Numerical Analysis”, Konark Pub. Ltd., Delhi.
4. P. Kandasamy, K. Thilagavathy [2003], “Calculus of Finite difference & Numerical Analysis”, S. Chand & Company Ltd., New Delhi-55.

## SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS

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<b>I – B.Sc. (Maths)</b>	<b>LATEX</b>	<b>NMT101</b>
<b>SEMESTER – I</b>	<b>For the students admitted from the year 2023</b>	<b>HRS/WK – 2</b>
<b>SEC-1 (NME)</b>		<b>CREDIT – 2</b>

### OBJECTIVE:

The course aims to introduce the concepts of LaTeX and to typeset typical mathematical papers using article style.

### COURSE OUTCOME:

At the end of the course students will be able to

CO1: know the basic concepts of document of Structure

CO2: learn Page style and numbering

CO3: know the concepts of Page numbering and mathematical symbols

CO4: know the concepts of inserting tables and images

CO5: understand the concept of hyperlinks, References (Bibliography).

SEMESTER: I	COURSE CODE: NMT101	COURSE TITLE: LATEX															HOURS 2	CREDITS 2			
COURSE OUTCOMES	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)															MEAN SCORE OF CO'S
	P O 1	P O 2	P O 3	P O 4	P O 5	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	P S O 6	P S O 7	P S O 8	P S O 9	P S O 10						
CO1	3	5	2	2	4	3	5	5	2	4	3	3	3	3	4	3.4					
CO2	4	5	3	4	3	4	4	3	5	4	3	4	5	3	5	3.9					
CO3	4	4	4	3	3	5	5	3	4	5	2	3	5	4	4	3.8					
CO4	3	5	3	3	4	5	5	3	4	4	3	4	5	3	5	3.9					
CO5	4	3	3	4	4	3	5	4	4	5	3	4	4	3	4	3.8					
Mean Overall Score																3.7					

Result: The Score of this Course is 3.7 (High)

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	$0 \leq \text{rating} \leq 1$	$1.1 \leq \text{rating} \leq 2$	$2.1 \leq \text{rating} \leq 3$	$3.1 \leq \text{rating} \leq 4$	$4.1 \leq \text{rating} \leq 5$
Rating	Very Poor	Poor	Moderate	High	Very High

# **SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS**

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## **UNIT I: DOCUMENT STRUCTURE**

Overview of LaTeX File - putting it all together - Sections - Table of Content.

## **UNIT II: FORMATTING PAGES**

Size - Margins - Page style and numbering – Orientation – Page breaks – Columns.

## **UNIT III: FORMATTING TEXT**

Punctuation marks – Text attribute and Font size – Colours - Text Alignment – Spacing – Bullets and Numbering – Mathematics.

## **UNIT IV: TABLES & IMAGES**

**Tables:** Basic Structure and Examples – Merging row – Merging column – Table colour

**Images:** Image size – Scaling on image – Trm /crap image – Use as a figure.

## **UNIT V: TITLES, LINKS, CITING**

Main title – Title page – Hyperlinks – cross- referencing- References (Bibliography).

## **TEXT BOOK:**

Firuz Karmali, A Short introduction to LaTeX, (Aibara), 2018.

UNIT I: Section 1.3 to 1.6

UNIT II: Section 2.1 to 2.6

UNIT III: Section 3.1 to 3.6 & 3.8

UNIT IV: Section 4.1 to 4.4, 5.1 to 5.3 & 5.6

UNIT V: Section 7.1 to 7.5

## **REFERENCE BOOKS:**

1. LaTeX, M.R.C. Van Dongen, Springer.
2. Martin J. Erickson and Donald Bindner, A Student's Guide to the Study, Practice, and Tools of Modern Mathematics, CRC Press, Boca Raton, FL, 2011.
3. L. Lamport. LATEX: A Document Preparation System, User's Guide and Reference Manual. Addison-Wesley, New York, second edition, 1994

## SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS

<b>I-B.Sc.(MATHS)</b>	<b>FOUNDATION COURSE- BRIDGE MATHEMATICS</b>	<b>FMT101</b>
<b>SEMESTER-I</b>	<b>For the students admitted from the year 2023</b>	<b>HRS/WK – 2</b>
<b>FC-1</b>		<b>CREDIT – 2</b>

### OBJECTIVES:

To bridge the gap and facilitate transition from higher secondary to tertiary education;  
To instill confidence among stakeholders and inculcate interest for Mathematics

### COURSE OUTCOME:

After completion of this course successfully, the students will be able to

CO1: Prove the binomial theorem and apply it to find the expansions of any  $(x + y)^n$  and also, solve the related problems

CO2: Find the various sequences and series and solve the problems related to them. Explain the principle of counting.

CO3: Find the number of permutations and combinations in different cases. Apply the principle of counting to solve the problems on permutations and combinations

CO4: To find the sum and difference of the angles, multiples and sub multiple angles. To convert sum into product and product into sum.

CO5: To learn differentiation rules, the definite and indefinite integral of functions.

SEMESTER I	COURSE CODE: FMT101	COURSE TITLE: FOUNDATION COURSE- BRIDGE MATHEMATICS	HOURS 2	CREDITS 2												
COURSE OUTCOMES	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)										MEAN SCORE OF CO'S
	P O 1	P O 2	P O 3	P O 4	P O 5	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	P S O 6	P S O 7	P S O 8	P S O 9	P S O 10	
CO1	3	4	4	3	3	4	5	5	2	4	3	5	2	3	4	3.6
CO2	3	4	3	3	3	4	5	5	2	4	3	5	2	2	4	3.46
CO3	3	4	4	3	3	4	4	5	2	4	3	5	2	2	4	3.46
CO4	3	4	4	3	3	4	5	5	2	4	3	5	3	2	4	3.6
CO5	3	4	3	3	3	4	5	5	2	4	3	5	2	2	4	3.46
Mean Overall Score															3.5	

Result: This Score of this course is 3.5 (High)

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	$0 \leq \text{rating} \leq 1$	$1.1 \leq \text{rating} \leq 2$	$2.1 \leq \text{rating} \leq 3$	$3.1 \leq \text{rating} \leq 4$	$4.1 \leq \text{rating} \leq 5$
Rating	Very Poor	Poor	Moderate	High	Very High

## **SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS**

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### **UNIT-I ALGEBRA**

Binomial theorem, General term, middle term, problems based on these concepts

### **UNIT-II SEQUENCES AND SERIES**

Fundamental principle of counting. Factorial n, Sequences and series (Progressions).

### **UNIT-III PERMUTATIONS AND COMBINATIONS**

Derivation of formulae and their connections, simple applications, combinations with repetitions.

### **UNIT-IV TRIGONOMETRY**

Trigonometry identities, sum and difference identities or compound angles formulae, multiple angle identities and submultiples identities, product to sum and sum to product identities.

### **UNIT-V CALCULUS**

Differentiation rules, derivatives of basic elementary functions, examples on chain rule, method of substitution or change of variable, important results, integration by parts, Bernoulli's formula for integration by parts.

### **TEXT BOOKS:**

1. 11<sup>th</sup> standard Mathematics (Vol I)

**Unit I:** Sec:5.2,5.3 (Pg.no: 203-209)

**Unit II:** Sec:4.2-4.3, 5.4-5.5(Pg.no:156-165 and 210-218)

**Unit III:** Sec: 4.4-4.5(Pg.no:167-186)

**Unit IV:** Sec 3.5:3.5.1,3.5.2,3.5.3 (Pg.no: 104-120)

2. 11<sup>th</sup> Standard Mathematics (Vol II)

**Unit V:** Sec:10.4:10.4.1,10.4.2,11.7.3,11.7.4,11.7.5,11.7.6 (Pg.no: 148-216 and 202-210).



## SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS

<b>I – B.Sc. (Maths)</b>	<b>INTEGRAL CALCULUS</b> For the students admitted from the year 2023	<b>MT203A</b>
<b>SEMESTER – II</b>		<b>HRS/WK – 6</b>
<b>CORE – IV</b>		<b>CREDIT – 4</b>

### OBJECTIVES:

Knowledge on integration and its geometrical applications, double, triple integrals and improper integrals., knowledge about Beta and Gamma functions and their applications and skills to Determine Fourier series expansions.

### COURSE OUTCOMES:

At the end of the Course the students will be able to

CO1: Find the derivative of vector and sum of vectors, product of scalar and vector point function and to determine derivatives of scalar and vector products

CO2: Applications of the operator ‘del’ and to Explain solenoidal and ir-rotational vectors

CO3: Solve simple line integrals

CO4: Solve surface integrals and volume integrals

CO5: Verify the theorems of Gauss, Stoke’s and Green’s (Two Dimension)

SEMESTER: I	COURSE CODE: MT203A	COURSE TITLE: INTEGRAL CALCULUS														HOURS 6	CREDITS 4
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)										MEAN SCORE OF CO’S	
	P O 1	P O 2	P O 3	P O 4	P O 5	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	P S O 6	P S O 7	P S O 8	P S O 9	PSO 10		
CO1	4	5	3	4	4	5	5	4	4	4	4	3	4	5	4	4.1	
CO2	4	5	3	4	3	4	4	3	5	4	3	4	5	3	5	3.9	
CO3	4	4	3	3	3	3	5	3	4	5	3	3	4	4	4	3.7	
CO4	4	5	3	4	3	5	4	3	4	4	3	3	5	3	4	3.8	
CO5	4	4	3	4	3	3	5	4	4	5	4	4	4	4	5	4.0	
Mean Overall Score															3.9		

Result: The Score of this Course is 3.9 (High)

This course is having **HIGH** association with programme outcomes and programme specific outcomes.

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very poor	Poor	Moderate	High	Very High

## **SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS**

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### **UNIT- I:**

Reduction formulae -Types, integration of product of powers of algebraic and trigonometric functions, integration of product of powers of algebraic and logarithmic functions - Bernoulli's formula.

### **UNIT- II:**

Multiple Integrals - definition of double integrals - evaluation of double integrals – double integrals in polar coordinates.

### **UNIT- III:**

Triple integrals –applications of multiple integrals -volumes of solids of revolution - areas of curved surfaces.

### **UNIT- IV:**

Beta and Gamma functions – infinite integral -definitions– recurrence formula of Gamma functions –properties of Beta and Gamma functions- relation between Beta and Gamma functions

### **UNIT-V:**

Geometrical Applications of Integral calculus: Area in Polar Coordinates, Trapezoidal Rule, Simpson's Rule, Length of a curve, arc of surface of revolutions.

### **TEXT BOOK:**

1. Calculus, Volume II, by S. Narayanan and T.K. Manicavachagom Pillay. –S. Viswanathan, Publishers-2007

Unit I: Chapter 1 Section 13, 13.1 to 13.10, 14, 15.1. Page No: 79-100

Unit II: Chapter 5 Sections 1, 2.1, 2.2, 3.1. Page No: 203-217

Unit III: Chapter 5 Sections 4, 5.1 to 5.3, 6.1 to 6.3 & Section 7. Page No: 220-228, 234-249

Unit IV: Chapter 7 Sections 2.1, 2.3, 3 to 5. Page No: 278-292

Unit V: Chapter 2 Sections 1.4, 2.1, 2.2, 4, 4.1, 4.2 & 5. Page No: 123-131, 140-149

### **REFERENCE BOOKS:**

1. H. Anton, I. Birens and S. Davis, Calculus, John Wiley and Sons, Inc., 2002.

2. G.B. Thomas and R.L. Finney, Calculus, Pearson Education, 2007.

3. P. Dyke, An Introduction to Laplace Transforms and Fourier Series, Springer Undergraduate Mathematics Series, 2001(second edition).

4. D. Chatterjee, Integral Calculus and Differential Equations, Tata McGraw Hill Publishing Company

## SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS

<b>YEAR - III</b>	<b>DISCRETE MATHEMATICS</b>	<b>MT511B</b>
<b>SEMESTER-V</b>	For the students admitted from the year 2021	<b>Hrs/Week:5</b>
<b>CORE: XI</b>		<b>Credit :4</b>

### OBJECTIVE:

The course aims to introduce mathematical logic, normal forms, grammars and languages, polish notations, lattices and Boolean algebra, formal languages.

### COURSE OUTCOME:

At the end of the course students will be able to

CO1: understand equivalence formula, Tautological implications and normal forms.

CO2: know about grammars and languages and polish notations.

CO3: understand the basic concept of lattices and its properties.

CO4: find the values of Boolean expressions and Boolean functions

CO5: study finite state system

SEMESTER V	COURSE CODE: MT511B	COURSE TITLE: DISCRETE MATHEMATICS														HOURS 5	CREDITS 4
COURSE OUTCOMES	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)										MEAN SCORE OF CO'S	
	P O 1	P O 2	P O 3	P O 4	P O 5	P S 1	P S 2	P S 3	P S 4	P S 5	P S 6	P S 7	P S 8	P S 9	PS 10		
CO1	3	4	4	3	3	4	5	5	2	4	3	5	2	3	4	3.6	
CO2	3	4	3	3	3	4	5	5	2	4	3	5	2	2	4	3.46	
CO3	3	4	4	3	3	4	4	5	2	4	3	5	2	2	4	3.46	
CO4	3	4	4	3	3	4	5	5	2	4	3	5	3	2	4	3.6	
CO5	3	4	3	3	3	4	5	5	2	4	3	5	2	2	4	3.46	
Mean Overall Score																3.5	

Result: This Score of this course is 3.5 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes

## **SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS**

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### **UNIT -1: MATHEMATICAL LOGIC**

Equivalence of Formulas – Duality law – Tautological implications- formulas with distinct truth tables – Functionally complete sets of connectives – Other connectives – Two state device and statement logic – Normal Forms –Disjunctive normal forms – Conjunctive normal forms – Principal disjunctive normal forms – Ordering and uniqueness of normal forms.

### **UNIT – 2: ALGEBRAIC STRUCTURES**

Grammars and languages- Discussion of grammars- Formal definitions of a language – Notion of syntax analysis. Polish expressions and their compilation- Polish notation- Conversion of Index Expressions to Polish notation.

### **UNIT – 3: LATTICES AND BOOLEAN ALGEBRA**

Lattices as partially ordered sets –Definition and examples – Some properties of lattices – Lattices as algebraic systems – Sub lattices, Direct product – Homomorphism- Some special lattices.

### **UNIT – 4: LATTICES AND BOOLEAN ALGEBRA**

Boolean Algebra- Definition and examples – Subalgebra, Direct product and homomorphism - Boolean functions- Boolean forms and Free Boolean algebras – Values of Boolean expressions and Boolean functions.

### **UNIT – 5: LATTICES AND BOOLEAN ALGEBRA**

Finite state machines- Introductory sequential circuits- Equivalence of finite State machines.

### **TEXT BOOK:**

1. J. P. Tremblay, R. Manohar Discrete Mathematical Structures with applications to Computer Science, Publication TATA. Mc Graw-hill (1997)  
Unit-1: Chapter 1: 1.2: 1.2.9 to 1.2.15,1.3: 1.3.1 to 1.3.5. (Pg.no – 26 to 64)  
Unit-2: Chapter 3: 3.3: 3.3.1 to 3.3.3,3.4:3.4.1,3.4.2. (Pg.no – 297 to 319)  
Unit -3: Chapter 4: 4.1: 4.1.1 to 4.1.5(Pg.no – 378 to 397)  
Unit-4: Chapter 4: 4.3: 4.3.1,4.3.2,4.4: 4.4.1,4.4.2(Pg.no – 397 to 418)  
Unit-5: Chapter 4: 4.6: 4.6.1 & 4.6.2(Pg.no – 453 to 465)

### **REFERENCE BOOKS:**

1. Lipschutz Seymour, Marc Lars Lipson, Schaum's Outline of Theory and Problems of Discrete Mathematics Third Edition, New Delhi: Tata McGraw-Hill Publishing Company Limited, 2010
2. Malik D.S. and M. K. Sen, Discrete Mathematics, India Binding House, India Edition, 2008
3. Norman L. Biggs, Discrete Mathematics, Second Edition, India: Oxford University Press, 2003

## SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS

<b>YEAR – III</b>	<b>COMPLEX ANALYSIS</b> <b>For the students admitted from the year 2021</b>	MT616A
<b>SEMESTER –VI</b>		<b>Hrs / Week: 6</b>
<b>CORE –XIV</b>		<b>Credit: 5</b>

**OBJECTIVE:**

The course aims to introduce the concepts of functions of complex variables, limits and continuity, Cauchy Riemann equations and analytic functions, Cauchy- Goursat theorem, Taylor’s Series, Cauchy’s residue theorem, linear transformations and conformal mapping.

**COURSE OUTCOME:**

The students after undergoing this course will be able to

CO1: knowledge pertaining to functions of complex variables, limits and continuity.

CO2: analyze and solve problems using Cauchy Riemann equations and analytic functions.

CO3: analyze and solve problems using Cauchy’s integral formula

CO4: analyze and solve problems using Cauchy’s Residue theorem, Taylor’s theorem and types of singular points.

CO5: analyze and solve problems using linear transformations and conformal mapping.

SEMESTER V	COURSE CODE: MT616A	TITLE OF THE PAPER: COMPLEX ANALYSIS-I	HOURS : 6	CREDITS : 5												
COURSE OUTCOME S	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)										MEAN SCORE OF CO’S
	P O 1	P O 2	P O 3	P O 4	P O 5	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	P S O 6	P S O 7	P S O 8	P S O 9	P S O 10	
CO1	4	4	3	3	4	3	5	4	3	4	3	4	3	4	4	3.7
CO2	3	4	3	3	3	3	5	4	3	4	4	4	3	4	5	3.7
CO3	3	5	3	3	4	4	5	4	3	5	3	4	4	4	4	3.9
CO4	3	5	3	3	4	4	5	4	3	4	4	4	3	4	4	3.8
CO5	4	4	3	3	4	4	5	4	3	5	4	4	4	4	4	3.9
Mean Overall Score															3.8	

Result: The Score of this Course is 3.8 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	$0 \leq \text{rating} \leq 1$	$1.1 \leq \text{rating} \leq 2$	$2.1 \leq \text{rating} \leq 3$	$3.1 \leq \text{rating} \leq 4$	$4.1 \leq \text{rating} \leq 5$
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

## **SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS**

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### **UNIT- I: LIMITS AND CONTINUITY**

Regions in the complex plane- Functions of a Complex variable– Limits – Theorems on Limits – Limits involving the point at infinity –Continuity –Derivatives.

### **UNIT- II: COMPLEX DIFFERENTIATION**

Cauchy-Riemann Equations-Sufficient Conditions for Differentiability-Polar Coordinates-Analytic Functions-Examples-Harmonic Functions-Uniquely Determined Analytic Functions.

### **UNIT- III: COMPLEX INTEGRATION:**

Contours (definition only)– Cauchy-Goursat Theorem- Proof of The Theorem(omit proof of the lemma). Simply connected domains – Multiply connected domains – Cauchy integral's formula – An extension of Cauchy integral's formula – Some consequences of the extension – Liouville's theorem and the fundamental theorem of Algebra – Maximum modulus principle.

### **UNIT- IV: COMPLEX INTEGRATION (continued)**

Taylor's Series – Proof of Taylor's theorem – Examples – Uniqueness of Series representations(Taylor's series only)– Isolated singular points – Residues – Cauchy's Residue Theorem – Residue at infinity – The three types of isolated singular points – Residues at poles – Examples – Zeros of an analytic function – Zeros and poles.

### **UNIT-V: TRANSFORMATIONS**

Linear transformations – The transformation  $w = 1/z$  - Linear fractional transformations – implicit form – Mappings of the upper half plane (Omit examples)- Preservation of angles

### **TEXT BOOK:**

James Ward Brown, Ruel V. Churchill (2009), "Complex Variables and Applications", McGraw – Hill International Edition.

Unit-I: Chapter-1 Sec: 11, Chapter-2 Sec:12, 15-19(Pg: 31,32 ,35,36 to 59)

Unit-II: Chapter-2 Sec: 21 – 27 (Pg: 63 to 85)

Unit-III: Chapter-4 Sec: 39,46-54 (Pg: 122, 150 to 178)

Unit-IV: Chapter-5 Sec: 57-59,66 Chapter-6 Sec:68-76(Pg: 189 to 195, 217,218,229 to 255)

Unit-V: Chapter-8 Sec:90,91,93-95, Chapter-9 Sec: 101(Pg: 311 to 313,319 to 327,355 to 358)

### **REFERENCE BOOKS:**

1. J. K. Goyal , K.P. Gupta, "Functions of a Complex Variable" (18<sup>th</sup> Revised), Enlarged Edition 2004, Pragathi Prakashan Publishers, Meerut, UP.
2. P. Duraipandian and Laxmi Duraipandian (1976), "Complex Analysis", Emerald Publishers, Chennai.
3. S. Ponnusamy (2000), "Foundations of Complex Analysis", Narosa Publishing House, New Delhi.
4. Murray R. Spiegel(2005), "Theory and Problems of Complex Variable", Tata-McGraw Hill Edition, New Delhi.

## SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS

<b>I B.Sc (Physics &amp; Chemistry)</b>	<b>ALLIED MATHEMATICS – I</b>	<b>AMT101A</b>
<b>SEMESTER – I</b>	<b>For the students admitted from the year 2023</b>	<b>HRS/WK – 6</b>
<b>ALLIED- I</b>		<b>CREDIT – 4</b>

### OBJECTIVES:

1. To acquire knowledge on finding roots of the complex equation.
2. To improve their ability on applications of matrices and calculus.

### COURSE OUTCOMES:

The students after undergoing this course will be able to

CO1: Attains knowledge on finding real roots of an algebraic equations.

CO2: develops the skill of transformation, approximation and reciprocal on equations.

CO3: adopts techniques in solving problem involving Matrices

CO4: provides skills on finding curvature and radius of curvature in Cartesian and polar co-ordinates.

CO5: enables to understand the applications of integration in real life situation.

SEMESTER I	COURSE CODE: AMT101A	COURSE TITLE ALLIED MATHEMATICS – I														HOURS 6	CREDITS 4
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)										MEAN SCORE OF CO'S	
	P O 1	P O 2	P O 3	P O 4	P O 5	P S 1	P S 2	P S 3	P S 4	P S 5	P S 6	P S 7	P S 8	P S 9	P S 10		
CO1	4	4	4	3	3	3	4	4	4	4	3	3	3	3	4	3.5	
CO2	3	3	3	3	3	4	3	4	4	3	3	4	3	3	3	3.3	
CO3	3	3	4	3	4	3	3	3	4	3	4	3	4	3	3	3.3	
CO4	4	4	3	4	4	3	3	3	3	3	4	3	3	3	4	3.4	
CO5	3	3	3	4	4	4	4	4	3	4	3	3	3	3	3	3.4	
Mean Overall Score															3.4		

Result: The Score of this Course is 3.4 (High)

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	$0 \leq \text{rating} \leq 1$	$1.1 \leq \text{rating} \leq 2$	$2.1 \leq \text{rating} \leq 3$	$3.1 \leq \text{rating} \leq 4$	$4.1 \leq \text{rating} \leq 5$
Rating	Very Poor	Poor	Moderate	High	Very High

## **SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS**

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### **UNIT-I: SOLUTIONS OF TRANSCENDENTAL AND ALGEBRAIC EQUATIONS**

Iteration method, Bisection method, Newton's method – Regula Falsi method

### **UNIT-II: MATRICES**

Characteristic equation of a square matrix– Eigen values and Eigen vectors – Cayley – Hamilton theorem [without proof] – Verification and computation of inverse matrix-

### **UNIT-III: DIFFERENTIAL CALCULUS**

n-th derivatives – Leibnitz theorem [without proof] and applications – Jacobians– Curvature and radius of curvature in Cartesian co-ordinates.

### **UNIT-IV: APPLICATION OF INTEGRATION**

Evaluation of double, triple integrals – Simple applications to area, volume (Omitting the change of order of integration)

### **UNIT-V: THEORY OF EQUATIONS**

Transformation of equations by increasing or decreasing roots by a constant, Reciprocal Equation–Horner's Method to find a root approximately (without proof)

### **TEXT BOOKS:**

1. A.Singaravelu "Numerical Methods" Meenakshi Publications  
Unit-I: Chapter 2
2. P. Durairandian and Dr. S. Udayabaskaran. 1997, "Allied Mathematics" ,Vol I & II. Chennai: Muhil Publishers.  
Unit-II: Volume-I- Sec(4.5, 4.5.2),  
Unit-III: Volume-II- Sec(1.1,1.1.1,1.1.2,1.2,1.4.3),  
Unit-IV: Volume-II-Chap:3 Sec(3.2,3.2.1,3.2.2,3.4,3.4.1,3.4.2,3.5,3.5.1,,3.6)  
Unit-V: Volume-I-Chap:3(3.2.2, 3.3.1, 3.4.1),

### **REFERENCE BOOKS:**

1. P. Balasubramanian and K. G. Subramanian. 1997, "Ancillary Mathematics", Vol I & II. New Delhi: Tata McGraw Hill.
2. S.P.Rajagopalan and R.Sattanathan(2005), "Allied Mathematics", Vol I & II. New Delhi: Vikas Publications.
3. P. R. Vittal (2003), "Allied Mathematics",Chennai: Marghan Publications.



## SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS

<b>I-B.Sc (Computer Science)</b>	<b>NUMERICAL METHODS</b> <b>For the students admitted in the year 2023</b>	<b>EMCS11A</b>
<b>SEMESTER – I</b>		<b>HRS/WK – 4</b>
<b>ALLIED-I</b>		<b>CREDIT – 3</b>

### OBJECTIVES:

The course aims to introduce the concepts of Finite differences, Central differences, Interpolation for unequal intervals, Inverse interpolation and Solutions of simultaneous linear equations.

### COURSE OUTCOMES:

The students after undergoing this course will be able to

CO1: develops the skill of calculation through forward and backward interpolations

CO2: learns to solve by central difference methods

CO3: knows to calculate interpolation for unequal intervals

CO4: collectively solves the solutions of simultaneous equations using different methods.

CO5: enables to understand the applications of integration in real life situation.

SEMESTER-I	COURSE CODE: AMCS11A	COURSE TITLE : NUMERICAL METHODS	HOURS 4	CREDITS 3												
COURSE OUTCOMES	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)										MEAN SCORE OF CO'S
	P O 1	P O 2	P O 3	P O 4	P O 5	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	P S O 6	P S O 7	P S O 8	P S O 9	P S O 10	
CO1	3	4	4	3	4	3	3	4	4	3	3	3	4	3	3	3.4
CO2	3	3	4	3	4	3	4	4	4	3	4	3	4	3	4	3.5
CO3	3	3	4	3	4	3	4	3	3	3	4	3	4	4	3	3.4
CO4	3	3	3	4	4	3	4	3	3	3	3	3	4	3	3	3.3
CO5	3	3	4	4	4	3	3	3	4	4	3	3	3	4	4	3.5
Mean Overall Score															3.4	

Result: The Score of this Course is 3.4 (High)

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	$0 \leq \text{rating} \leq 1$	$1.1 \leq \text{rating} \leq 2$	$2.1 \leq \text{rating} \leq 3$	$3.1 \leq \text{rating} \leq 4$	$4.1 \leq \text{rating} \leq 5$
Rating	Very Poor	Poor	Moderate	High	Very High

## **SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS**

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### **UNIT- I: FINITE DIFFERENCES**

Operator E, Relation between  $\Delta, \nabla$  and E – Interpolation: Newton – Gregory forward & backward formulae for interpolation(without proof) – simple problems.

### **UNIT-II: CENTRAL DIFFERENCES**

Central difference Operators – Central differences formulae: Gauss Forward and Backward formulae(without proof) – simple problems – Sterling’s formula(without proof) – Bessel’s formula(Without Proof) - simple problems.

### **UNIT – III: INTERPOLATING FOR UNEQUAL INTERVALS AND INVERSE INTERPOLATION**

Newton’s divided differences formula- Lagrange’s formula[without proof] -Lagrange’s method and Reversion of series method [Using Newton’s forward formula only]

### **UNIT – IV: SOLUTION OF SIMULTANEOUS EQUATION**

Gauss elimination method – Matrix inversion method – Gauss Jordan method - Gauss – Seidal method [Three unknowns only]

### **UNIT – V: SOLUTION OF DIFFERENTIAL EQUATION**

Euler’s method:Euler’s modified method-Second order differential equation using Runge kutta method (Omit second degree equation problems)- Fourth order differential equation using Runge kutta method.

### **TEXT BOOK:**

1. A. Singaravelu [2004], “Numerical Methods”, Meenakshi Agency, Chennai

Unit 1: Chapters: 3 (sec 3.1- 3.5, 3.12-3.16)

Unit 2: Chapters: 3 (sec 3.6 – 3.10)

Unit 3: Chapters: 4(fully)

Unit 4: Chapters: 1(sec 1.1 -1.8)

Unit 5: Chapters 2, 3 (sec 3.2)

### **REFERENCE BOOKS :**

1. S.Arumugham (2003), “Numerical Methods”, New Gamma Publishing, Palayamkottai.
2. H.C.Saxena (1991), “Finite differences and Numerical Analysis”, S.Chand & Co. Delhi
3. B.D.Gupta (2001), “Numerical Analysis”, Konark Pub. Ltd., Delhi
4. P.Kandasamy, K.Thilagavathy (2003), “Calculus of Finite difference & Numerical Analysis”, S.Chand & Company Ltd., New Delhi-55.

## SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS

<b>I – BCA</b>	<b>NUMERICAL METHODS</b>	<b>EMCA11A</b>
<b>SEMESTER – I</b>	<b>For the students admitted from the year 2023</b>	<b>HRS/WK – 4</b>
<b>ELECTIVE -1</b>		<b>CREDIT – 3</b>

### OBJECTIVES

The course aims to introduce the concepts of Finite differences, Central differences, Interpolation for unequal intervals, Inverse interpolation and Solutions of simultaneous linear equations.

### COURSE OUTCOMES:

At the end of the course students will be able to

CO1: solve the problems in Newton’s forward and backward method.

CO2: solve analyze the difference between Gauss forward and backward, Stirling’s method and Bessel’s method.

CO3: certain equal intervals and unequal intervals.

CO4: determine the solutions for lineal algebraic equations.

CO5: determine the solutions for Numerical differential equations

SEMESTER I	COURSE CODE EMCA11A	COURSE TITLE : NUMERICAL METHODS														HOURS 4	CREDITS 3
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)										MEAN SCORE OF CO’S	
	P O 1	P O 2	P O 3	P O 4	P O 5	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	P S O 6	P S O 7	P S O 8	P S O 9	PS O 10		
CO1	3	4	4	3	3	4	5	5	2	4	3	5	2	3	4	3.6	
CO2	3	4	3	3	3	4	5	5	2	4	3	5	2	2	4	3.46	
CO3	3	4	4	3	3	4	4	5	2	4	3	5	2	2	4	3.46	
CO4	3	4	4	3	3	4	5	5	2	4	3	5	3	2	4	3.6	
CO5	3	4	3	3	3	4	5	5	2	4	3	5	2	2	4	3.46	
Mean Overall Score																3.5	

Result: The Score of this Course is 3.5 (High)

This course is having **HIGH** association with programme outcomes and programme specific outcomes

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	$0 \leq \text{rating} \leq 1$	$1.1 \leq \text{rating} \leq 2$	$2.1 \leq \text{rating} \leq 3$	$3.1 \leq \text{rating} \leq 4$	$4.1 \leq \text{rating} \leq 5$
Rating	Very poor	Poor	Moderate	High	Very High

## **SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS**

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### **UNIT- I: FINITE DIFFERENCES**

First and higher order differences-forward differences and Backward differences -Operators, Relation between  $\nabla, \Delta$  and E – Interpolation –Gregory- Newton’s forward & backward formulae for interpolation.

### **UNIT-II: CENTRAL DIFFERENCES**

Central difference operators – Central differences formulae- Gauss Forward and Backward formulae – Stirling’s formula – Bessel’s formula.

### **UNIT-III: INTERPOLATING FOR UNEQUAL INTERVALS AND INVERSE INTERPOLATION**

Divided differences – Newton’s divided differences formula and Lagrange’s interpolation formula – Estimating the Missing terms for equal interval [with one or more missing values] – Inverse Lagrange’s method.

### **UNIT – IV: LINEAR ALGEBRAIC EQUATIONS**

Gauss Elimination Method – Gauss Jordan Method- Gauss Seidal Method – Crout’s Method [Three unknowns only].

### **UNIT – V: NUMERICAL DIFFERENTIAL EQUATIONS AND INTEGRATION**

Euler’s method: Improved Euler’s method, Modified Euler’s method- The 4<sup>th</sup> order Runge Kutta Method for first order differential equations.

### **TEXT BOOKS:**

1. A. Singaravelu [2004], “Numerical Methods”, Meenakshi Agency, Chennai
2. M.K. Venkataraman (1992), “Numerical Methods for Science and Engineering”, National Publishing Company, Chennai.  
UNIT-I: Chapter 3: 3.1, 3.2, 3.3, 3.4, 3.5, 3.12, 3.13, 3.15  
UNIT II: Chapter 3: 3.6, 3.7, 3.8, 3.9, 3.10  
UNIT III: Chapter 4: 4.1, 4.2, 4.4, 4.9, 4.15  
UNIT IV: Chapter 2: 2.41, 2.47, 2.52, 2.61, 2.77  
UNIT V: Chapter 5: 5.12, 5.13, 5.14, 5.19, 5.54

### **REFERENCE BOOKS:**

1. S.Arumugham [2003], “Numerical Methods”, New Gamma Publishing, Palayamkottai.
2. H.C.Saxena [1991], “Finite Differences and Numerical Analysis” ,S.Chand & Co. Delhi.
3. B.D.Gupta(2001), “Numerical Analysis”, Konark Pub. Ltd., Delhi.
4. P.Kandasamy, K.Thilagavathy [2003], “Calculus of Finite difference & Numerical Analysis”,S.Chand & Company Ltd., New Delhi-55.

## SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS

<b>I – M.Sc (Maths)</b>	<b>ALGEBRAIC STRUCTURE</b>	<b>PMT11</b>
<b>SEMESTER – I</b>	<b>For the students admitted from the year 2023</b>	<b>HRS/WK- 7</b>
<b>CORE – I</b>		<b>CREDIT –6</b>

### OBJECTIVES:

To introduce the concepts and to develop working knowledge on class equation, solvability of groups, finite abelian groups, linear transformations, real quadratic forms

### COURSE OUTCOME:

To help the students to learn the higher level on Algebra

CO1: Studying more on groups about Another Counting Principle

CO2: Studying about Sylow's proof, Direct products and Modules of groups

CO3: Learning about the linear transformation.

CO4: Reading the canonical forms and Jordan forms of Matrices

CO5: Knowing trace and transpose along with transformation

SEMESTER I	COURSE CODE: PMT11	COURSE TITLE: ALGEBRAIC STRUCTURE	HOURS 7	CREDITS 5												
COURSE OUTCOMES	PROGRAMME OUTCOMES	PROGRAMME SPECIFIC OUTCOMES(PSO)	MEAN SCORE OF CO'S													
	P O 1	P O 2			P O 3	P O 4	P O 5	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	P S O 6	P S O 7	P S O 8	P S O 9
CO1	2	3	3	4	4	4	2	3	3	2	4	4	5	5	4	3.5
CO2	3	4	3	4	4	5	3	3	3	3	4	5	5	4	4	3.8
CO3	4	5	4	4	5	4	3	4	3	5	5	4	4	5	4	4.2
CO4	3	4	4	3	4	4	4	4	4	4	5	4	5	4	4	4.0
CO5	4	5	5	5	5	4	4	5	4	4	5	4	5	4	4	4.5
Mean Overall Score																4.0

Result: The Score of this Course is 4.0 (High)

Association	10%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	$0 \leq \text{rating} < 1$	$1.1 \leq \text{rating} \leq 2$	$2.1 \leq \text{rating} \leq 3$	$3.1 \leq \text{rating} \leq 4$	$4.1 \leq \text{rating} \leq 5$
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

## **SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS**

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### **UNIT-I: COUNTING PRINCIPLE AND SYLOW'S THEOREM:**

Counting Principle - Class equation for finite groups and its applications – Sylow's theorems (For theorem 2.12.1, First proof only).

### **UNIT-II: SOLVABLE GROUPS AND MODULES:**

Solvable groups – Direct products – Finite abelian groups- Modules

### **UNIT-III: LINEAR TRANSFORMATION:**

Linear Transformations: Canonical forms – Triangular form – Nilpotent transformations.

### **UNIT-IV: RATIONAL CANONICAL FORM:**

Jordan form – rational canonical form.

### **UNIT-V: TRACE AND TRANSPOSE:**

Trace and transpose – Hermitian, unitary, normal transformations, real quadratic form.

### **TEXT BOOK:**

I.N. Herstein. Topics in Algebra (II Edition) Wiley Eastern Limited, New Delhi, 1975.

Unit 1- Chapter 2: Sections 2.11 and 2.12 (Omit Lemma 2.12.5) Pg.no: 82-101

Unit 2 – Chapter 5 : Section 5.7 (Lemma 5.7.1, Lemma 5.7.2, Theorem 5.7.1)

Chapter 2: Section 2.13 and 2.14 (Theorem 2.14.1 only)

Chapter 4: Section 4.5 Pg.no: 103-111,201-205,250-255

Unit 3- Chapter 6: Sections 6.4, 6.5 Pg.no: 285-292

Unit 4- Chapter 6 : Sections 6.6 and 6.7 Pg.no: 298-313

Unit 5- Chapter 6 : Sections 6.8, 6.10 and 6.11 (Omit 6.9) Pg.no:313-322,336-354

### **REFERENCE BOOKS:**

1. M.Artin, Algebra, Prentice Hall of India, 1991.
2. P.B.Bhattacharya, S.K.Jain, and S.R.Nagpaul, Basic Abstract Algebra (II Edition) Cambridge University Press, 1997. (Indian Edition)
3. I.S.Luther and I.B.S.Passi, Algebra, Vol. I –Groups(1996); Vol. II Rings, Narosa Publishing House , New Delhi, 1999
4. D.S.Malik, J.N. Mordeson and M.K.Sen, Fundamental of Abstract Algebra, McGraw Hill (International Edition), New York. 1997.
5. N.Jacobson, Basic Algebra, Vol. I & II W.H.Freeman (1980);

## SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS

<b>I – M.Sc. (Maths)</b>	<b>REAL ANALYSIS -I</b>	<b>PMT12</b>
<b>SEMESTER – I</b>	<b>For the students admitted from the year 2023</b>	<b>HRS/WK – 7</b>
<b>CORE – II</b>		<b>CREDIT – 6</b>

### OBJECTIVES:

To work comfortably with functions of bounded variation, Riemann-Stieltjes Integration, convergence of infinite series, infinite product and uniform convergence and its interplay between various limiting operations.

### COURSE OUTCOMES:

At the end of the Course the students should be able to exhibit

CO1: Learning the functions of bounded variations in real analysis.

CO2: Describe the concept of Riemann - Stieltjes integral and its properties.

CO3: Knowing more properties of Riemann- Stieltjes Integral.

CO4: Receiving more information about infinite series.

CO5: Acquiring more knowledge of sequences of functions.

SEMESTER I	COURSE CODE: PMT12	COURSE TITLE : REAL ANALYSIS –I	HOURS 7	CREDITS 5												
COURSE OUTCOME S	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)										MEAN SCORE OF CO'S
	P O 1	P O 2	P O 3	P O 4	P O 5	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	P S O 6	P S O 7	P S O 8	P S O 9	P S O 10	
CO1	4	4	3	4	3	5	3	4	2	3	4	3	1	1	5	3.1
CO2	3	4	3	3	2	4	2	3	1	3	4	3	2	2	5	2.9
CO3	4	3	2	3	2	4	4	4	3	3	4	2	2	3	4	3.2
CO4	3	4	2	2	3	4	2	3	3	2	4	2	2	3	5	3.1
CO5	4	5	3	2	2	4	1	4	2	2	4	3	3	3	5	3.1
Mean Overall Score															3.1	

Result: The Score of this Course is 3.1 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	$0 \leq \text{rating} \leq 1$	$1.1 \leq \text{rating} \leq 2$	$2.1 \leq \text{rating} \leq 3$	$3.1 \leq \text{rating} \leq 4$	$4.1 \leq \text{rating} \leq 5$
Rating	Very poor	Poor	Moderate	High	Very High

This course is having **HIGH** association with programme outcomes and programme specific outcomes

**UNIT-I: FUNCTIONS OF BOUNDED VARIATION**

Introduction - Properties of monotonic functions - Functions of bounded variation - Total variation - Additive property of total variation - Total variation on  $[a, x]$  as a function of  $x$  - Functions of bounded variation expressed as the difference of two increasing functions - Continuous functions of bounded variation.

Infinite Series : Absolute and conditional convergence - Dirichlet's test and Abel's test - Rearrangement of series - Riemann's theorem on conditionally convergent series.

**UNIT-II: THE RIEMANN - STIELTJES INTEGRAL**

Introduction - Notation - The definition of the Riemann - Stieltjes integral - Linear Properties - Integration by parts- Change of variable in a Riemann - Stieltjes integral - Reduction to a Riemann Integral - Euler's summation formula - Monotonically increasing integrators, Upper and lower integrals - Additive and linearity properties of upper, lower integrals - Riemann's condition - Comparison theorems.

**UNIT-III: THE RIEMANN - STIELTJES INTEGRAL (Continued)**

Integrators of bounded variation - Sufficient conditions for the existence of Riemann - Stieltjes integrals - Necessary conditions for the existence of RS integrals- Mean value theorems -integrals as a function of the interval – Second fundamental theorem of integral calculus-Change of variable -Second Mean Value Theorem for Riemann integral- Riemann-Stieltjes integrals depending on a parameter- Differentiation under integral sign -Lebesgue criteriaon for existence of Riemann integrals.

**UNIT -IV: INFINITE SERIES AND INFINITE PRODUCTS**

Double sequences - Double series - Rearrangement theorem for double series - A sufficient condition for equality of iterated series - Multiplication of series – Cesaro summability - Infinite products.

Power series - Multiplication of power series - The Taylor's series generated by a function - Bernstein's theorem - Abel's limit theorem - Tauber's theorem.

**UNIT-V: SEQUENCES OF FUNCTIONS**

Pointwise convergence of sequences of functions - Examples of sequences of real - valued functions - Uniform convergence and continuity - Cauchy condition for uniform convergence - Uniform convergence of infinite series of functions - Riemann - Stieltjes integration – Non-uniform Convergence and Term-by-term Integration - Uniform convergence and differentiation - Sufficient condition for uniform convergence of a series - Mean convergence.



## **SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS**

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### **TEXT BOOK**

1. Tom M. Apostol: Mathematical Analysis, 2nd Edition, Addison-Wesley Publishing Company Inc. New York, 1974.

Unit 1 - Chapter - 6: Sections 6.1 to 6.8 (Page: 127 - 133)

Chapter - 8: Sections 8.8, 8.15, 8.17 & 8.18 (Page: 189, 193 -194, 196 -197)

Unit 2 - Chapter – 7: Sections 7.1 to 7.14 (Page: 140 - 156)

Unit 3 - Chapter - 7: Sections 7.15 to 7.26 (Page: 156 - 173)

Unit 4 - Chapter – 8: Sections 8.20, 8.21 to 8.26 (Page: 199 - 209)

Chapter - 9: Sections 9.14, 9.15, 9.19, 9.20, 9.22 & 9.23  
(Page: 234 - 238, 241 - 244, 244 -247)

Unit 5 -Chapter – 9: Sec 9.1 to 9.6, 9.8, 9.9, 9.10, 9.11 & 9.13

(Page: 218 - 224, 225 - 231, 232 - 233)

### **REFERENCE BOOKS**

1. Bartle, R.G. Real Analysis, John Wiley and Sons Inc./1976.

2. Rudin, W, Principles of Mathematical Analysis, 3rd Edition. McGraw Hill Company, New York, 1976.

## SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS

<b>I – M.Sc (Maths)</b>	<b>ORDINARY DIFFERENTIAL EQUATIONS</b>	<b>PMT13</b>
<b>SEMESTER – I</b>	<b>For the students admitted from the year 2023</b>	<b>HRS/WK-6</b>
<b>CORE – III</b>		<b>CREDIT –4</b>

### OBJECTIVES:

To develop strong background on finding solutions to linear differential equations with constant and variable coefficients and also with singular points, to study existence and uniqueness of the solutions of first order differential equations

### COURSE OUTCOME:

**CO1:** Establish the qualitative behavior of solutions of systems of differential equations.

**CO2:** Recognize the physical phenomena modeled by differential equations and dynamical systems.

**CO3:** Analyze solutions using appropriate methods and give examples.

**CO4:** Formulate Green's function for boundary value problems.

**CO5:** Understand and use various theoretical ideas and results that underlie the mathematics in this course.

SEMESTER I	COURSE CODE: PMT13	COURSE TITLE: ORDINARY DIFFERENTIAL EQUATIONS	HOURS 6	CREDITS 4													
COURSE OUTCOMES	PROGRAMME OUTCOMES					PROGRAMME SPECIFIC OUTCOMES(PSO)										MEAN SCORE OF CO'S	
	P O 1	P O 2	P O 3	P O 4	P O 5	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	P S O 6	P S O 7	P S O 8	P S O 9	P S O 10		
CO1	2	3	3	4	4	4	2	3	3	2	4	4	5	5	4	3.5	
CO2	3	4	3	4	4	5	3	3	3	3	4	5	5	4	4	3.8	
CO3	4	5	4	4	5	4	3	4	3	5	5	4	4	5	4	4.2	
CO4	3	4	4	3	4	4	4	4	4	4	5	4	5	4	4	4.0	
CO5	4	5	5	5	5	4	4	5	4	4	5	4	5	4	4	4.5	
Mean Overall Score															4.0		

Result: The Score of this Course is 4.0 (High)

Association	10%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	$0 \leq \text{rating} \leq 1$	$1.1 \leq \text{rating} \leq 2$	$2.1 \leq \text{rating} \leq 3$	$3.1 \leq \text{rating} \leq 4$	$4.1 \leq \text{rating} \leq 5$
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

**UNIT-I: LINEAR EQUATIONS WITH CONSTANT COEFFICIENTS**

Second order homogeneous equations-Initial value problems-Linear dependence and independence-Wronskian and a formula for Wronskian-Non-homogeneous equation of order two.

**UNIT-II: LINEAR EQUATIONS WITH CONSTANT COEFFICIENTS**

Homogeneous and non-homogeneous equation of order  $n$  –Initial value problems-Annihilator method to solve non-homogeneous equation- Algebra of constant coefficient operators.

**UNIT-III: LINEAR EQUATION WITH VARIABLE COEFFICIENTS**

Initial value problems -Existence and uniqueness theorems – Solutions to solve a non-homogeneous equation – Wronskian and linear dependence – reduction of the order of a homogeneous equation – homogeneous equation with analytic coefficients-The Legendre equation.

**UNIT-IV: LINEAR EQUATION WITH REGULAR SINGULAR POINTS**

Euler equation – Second order equations with regular singular points –Exceptional cases – Bessel Function.

**UNIT-V:** Existence and uniqueness of solutions to first order equations: Equation with variable separated – Exact equation – method of successive approximations – the Lipchitz condition – convergence of the successive approximations and the existence theorem.

**TEXT BOOK:**

E.A.Coddington, A introduction to ordinary differential equations (3<sup>rd</sup> Printing) Prentice-Hall of India Ltd., New Delhi, 1987

Unit 1- Chapter 2: Sections 1 to 6

Unit 2 - Chapter 2: Sections 7 to 12.

Unit 3- Chapter 3: Sections 1 to 8 (Omit section 9)

Unit 4- Chapter 4: Sections 1 to 4 and 6 to 8 (Omit sections 5 and 9)

Unit 5- Chapter 5: Sections 1 to 6 (Omit Sections 7 to 9)

**REFERENCE BOOKS:**

1. Williams E. Boyce and Richard C. DI Prima, Elementary differential equations and boundary value problems, John Wiley and sons, New York, 1967.
2. George F Simmons, Differential equations with applications and historical notes, Tata McGraw Hill, New Delhi, 1974.
3. N.N. Lebedev, Special functions and their applications, Prentice Hall of India, New Delhi, 1965.
4. W.T. Reid. Ordinary Differential Equations, John Wiley and Sons, New York, 1971
5. M.D.Raisinghania, Advanced Differential Equations, S.Chand & Company Ltd. New Delhi 2001
6. B.Rai, D.P.Choudary and H.I. Freedman, A Course in Ordinary Differential Equations, Narosa Publishing House, New Delhi, 2002.

## SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS

<b>I – M.Sc (Maths)</b>	<b>GRAPH THEORY AND APPLICATIONS</b>	<b>EPMT14</b>
<b>SEMESTER – I</b>		<b>HRS/WK- 5</b>
<b>ELECTIVE – I</b>	<b>For the students admitted from the year 2023</b>	<b>CREDIT –3</b>

### OBJECTIVES:

This course introduces the application of graph theory in various field.

### COURSE OUTCOME:

At the end of the course students will be able to

CO1: develop the skill of calculating minimum shortest path in a weighted graph.

CO2: learn to find minimum weight of a complete graph using kruskal's algorithm.

CO3: know to determine the good solution for travelling salesman problem.

CO4: solve the time tabling problem using edge colorings.

CO5: understand the characterization of vertex coloring and its application.

SEMESTER I	COURSE CODE: EPMT14	COURSE TITLE: GRAPH THEORY AND APPLICATIONS	HOURS 5	CREDITS 3												
COURSE OUTCOMES	PROGRAMME OUTCOMES	PROGRAMME SPECIFIC OUTCOMES(PSO)	MEAN SCORE OF CO'S													
	P O 1	P O 2			P O 3	P O 4	P O 5	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	P S O 6	P S O 7	P S O 8	P S O 9
CO1	3	5	4	4	3	3	5	3	4	4	3	4	4	4	4	3.8
CO2	4	5	3	4	3	4	4	3	5	4	3	4	5	3	5	3.9
CO3	4	4	4	3	3	5	5	3	4	5	2	3	5	4	4	3.8
CO4	3	5	3	4	3	5	5	3	4	4	3	4	5	3	5	3.9
CO5	3	4	3	4	4	3	5	4	4	5	3	4	4	3	4	3.8
Mean Overall Score															3.8	

Result: The Score of this Course is 3.8 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	$0 \leq \text{rating} \leq 1$	$1.1 \leq \text{rating} \leq 2$	$2.1 \leq \text{rating} \leq 3$	$3.1 \leq \text{rating} \leq 4$	$4.1 \leq \text{rating} \leq 5$
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

## **SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS**

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**UNIT-I: GRAPHS & SUBGRAPHS:** Paths & Connection-cycles. Sperner's Lemma, Application: The Shortest Path Problem

**UNIT-II: TREES & CONNECTIVITY:** Trees-cut edges and bonds-cut vertices- Cayles's formula. Application: The connector Problem. Connectivity: Connectivity-Blocks. Applications: Constructions of Reliable Communication Networks.

**UNIT-III: EULER TOURS & HAMILTON CYCLES:** Euler Tours & Hamilton Cycles. Application: The Chinese postman Problem -The travelling salesman problem.

**UNIT-IV: EDGE COLOURINGS & INDEPENDENT SETS:** Edge chromatic number vizing's theorem. Independent sets Ramsey's theorem. Application: The timetabling Problem.

**UNIT-V: VERTEX COLOURINGS:** Chromatic number-Brooks' theorem Hajos Conjecture-Chromatic polynomials-Garth and Chromatic Number. Applications: A storage problem

**TEXT BOOK:** Bondy JA & Murthy U.S.R. "Graph theory and its applications" GREAT Britain MACMILLAN Press Lud, Re-Printing 1982.

Unit 1: chapter I Sections - 1.6, 17, 18.1.9 (Pg. 12 to 24)

Unit 2: chapters 2 & 3 Sections-21, 22, 23, 24, 25, 3: 3.1, 3.2, 3.3(Pg: 25 to 47)

Unit 3: chapter 4: Sections -4.1.4.2, 4.3, 4.4Pg:51 to 65)

Unit 4: chapters 6 & 7: Sections -6.1.6.2, 6.3,7: 7.1, 7.2(Pg91 to 96 & 101 to 108)

Unit 5: chapter 8: Sections-8.1, 8.2, 8.3.8.4, 8.5, 8.6(Pg 117 to 131)

### **REFERENCE BOOKS:**

1. R. Balakrishnan & K. Ranganathan, "A Text book of graph theory". Springer 2000,
2. F Harary." Graph theory" Addison Wesley, 1969.

## SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS

<b>I – M.Sc (Maths)</b>	<b>FUZZY SETS AND THEIR APPLICATIONS</b>	<b>EPMT15</b>
<b>SEMESTER – I</b>	<b>For the students admitted from the year 2023</b>	<b>HRS/WK- 5</b>
<b>ELECTIVE – II</b>		<b>CREDIT –3</b>

### OBJECTIVES:

To get formalized with fuzzy principles and appreciate by constricting with crisp set and principle.

### COURSE OUTCOME:

CO1: provides knowledge on the basic definitions and fundamentals of fuzzy set theory

CO2: able to understand the operations of fuzzy set and properties

CO3: understands the concept of fuzzy relations in real life situations

CO4: attains knowledge of the fuzzy arithmetic

CO5: ability for constructing the fuzzy sets

SEMESTER I	COURSE CODE: EPMT15	COURSE TITLE: FUZZY SETS AND THEIR APPLICATIONS	HOURS 5	CREDITS 3													
COURSE OUTCOMES	PROGRAMME OUTCOMES					PROGRAMME SPECIFIC OUTCOMES(PSO)											MEAN SCORE OF CO'S
	P1	P2	P3	P4	P5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	PSO11	
CO1	3	5	4	4	3	3	5	3	4	4	3	4	4	4	4	4	3.8
CO2	4	5	3	4	3	4	4	3	5	4	3	4	5	3	5	3.9	
CO3	4	4	4	3	3	3	4	3	4	3	2	3	4	4	4	3.5	
CO4	3	5	3	4	3	5	5	3	4	4	3	4	5	3	5	3.9	
CO5	4	4	4	4	3	4	3	4	4	3	4	4	3	3	3	3.7	
Mean Overall Score																3.8	

Association	10%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	$0 \leq \text{rating} \leq 1$	$1.1 \leq \text{rating} \leq 2$	$2.1 \leq \text{rating} \leq 3$	$3.1 \leq \text{rating} \leq 4$	$4.1 \leq \text{rating} \leq 5$
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

**UNIT I: FUZZY SETS:**

Fuzzy sets – Basic types – Basic concepts – Characteristics – Significance of the paradigm shift – Additional Properties of  $\alpha$  – Cuts

**UNIT II: FUZZY SETS VERSUS CRISP SETS:**

Representation of Fuzzy sets - Extension principle of Fuzzy sets – Operation on Fuzzy Sets – Types of Operation – Fuzzy complements.

**UNIT III: OPERATIONS ON FUZZY SETS:**

Fuzzy intersection – t-norms, Fuzzy unions – t conorms – Combinations of operations – Aggregation Operations.

**UNIT IV: FUZZY ARITHMETIC:**

Fuzzy numbers – Linguistic variables – Arithmetic operation on intervals – Lattice of Fuzzy numbers.

**UNIT V: CONSTRUCTING FUZZY SETS:**

Methods of construction: An Overview – Direct methods with one expert – Direct method with multiple experts – indirect method with multiple experts and one expert – Construction from sample data.

**TEXT BOOK:**

G.J. Klir, and Bo Yuan, Fuzzy Sets and fuzzy Logic: Theory and Applications, Prentice Hall of India Ltd., New Delhi, 2005.

Unit-1: Chapter 1: Sections 1.3 to 1.5 and Chapter 2: Sections 2.1

Unit-2: Chapter 2: Sections 2.2 to 2.3 and Chapter 3: Sections 3.1 to 3.2

Unit-3: Chapter 3: Sections 3.3 to 3.6

Unit-4: Chapter 4: Sections 4.1 to 4.4

Unit-5: Chapter 10: Sections 10.1 to 10.7

**REFERENCE BOOKS:**

1. H.J. Zimmermann, Fuzzy Set Theory and its Applications, Allied Publishers, Chennai, 1996.
2. A.Kaufman, Introduction to the Theory of Fuzzy Subsets, Academic Press, New York, 1975.
3. V.Novak, Fuzzy Sets and Their Applications, Adam Hilger, Bristol, 1969.

## SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS

<b>I – M.Sc (Maths)</b>	<b>NUMERICAL ANALYSIS WITH JAVA</b>	PMT808A
<b>SEMESTER – II</b>	<b>PROGRAMMING</b>	<b>HRS/WK – 4</b>
<b>CORE – VI</b>	<b>For the students admitted from the year 2023</b>	<b>CREDIT – 2</b>

### OBJECTIVE:

The course aims to introduce the techniques of Java Programming and to solve Numerical Analysis problems in Non -Linear equations and Integration using Java Programming.

### COURSE OUTCOME:

At the end of the course students will be able to

CO1: know the methods to find roots of non-linear equation.

CO2: know the Numerical value of Integration by comparing the Analytical solution.

CO3: know the intermediate values using cubic spline.

CO4: know the methods of cubic spline to solve the differential equations.

CO5: know the numerical solution of partial differential equations.

SEMESTER I	COURSE CODE: PMT808A	COURSE TITLE: NUMERICAL ANALYSIS WITH JAVA PROGRAMMING	HOURS: 4	CREDITS 2												
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)										MEAN SCORE OF CO'S
	P O 1	P O 2	P O 3	P O 4	P O 5	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	P S O 6	P S O 7	P S O 8	P S O 9	PS O 10	
CO1	3	4	4	4	2	4	3	3	3	3	4	4	4	3	4	3.5
CO2	4	4	3	3	4	5	4	3	3	3	4	5	5	4	4	3.9
CO3	5	5	3	4	3	3	4	3	4	5	4	4	4	2	4	3.8
CO4	3	4	4	3	4	3	5	4	2	4	4	3	4	4	4	3.7
CO5	3	4	3	4	3	4	4	3	4	4	5	4	3	3	3	3.6
Mean Overall Score															3.7	

Result: The Score of this Course is 3.7 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.



**UNIT-I: NON-LINEAR EQUATIONS**

Fixed point iteration method and its convergence- Bisection method- Regula – Falsi method – Secant method – Convergence of secant/Regula-Falsi method – Newton- Raphson method and its convergence- Convergence when roots are repeated.

**UNIT-II: NUMERICAL INTEGRATION AND SPLINE**

Open type Formulae -Newton–Cotes Formulae - Euler-Maclaurin formula –Richardson’s Extrapolation- Romberg Integration- Gaussian quadrature 2-point and 3-point Formulae- Splines and their Applications-Introduction-Construction of cubic Spline First and Second Derivative forms (Problems only&No Derivations)-Minimal property of cubic spline- Introduction to B - Splines- Bezier Spline curves-Convex polygon and Convex Hull.

**UNIT-III: PARTIAL DIFFERENTIAL EQUATION**

Some standard forms – Boundary conditions – Finite difference approximations for derivatives – Methods for solving parabolic equation – Explicit method – Fully implicit scheme – Crank–Nicolson’s (C-N) scheme.

**UNIT-IV: JAVA PROGRAMMING**

Introduction- Constants, variables and Data types-Operators and Expression- Decision Making and Branching- Decision Making and Looping- Classes, Objects and Methods- Arrays, String and Vectors.

**UNIT-V: APPLLET PROGRAMMING AND GRAPHICS**

Introduction -How Applets differ from Applications-Preparing to Write Applets-Building Applet code-Creating an executable Applet. Graphics Programming -The Graphics Class- Lines and Rectangles-Circles and Ellipses-Drawing Arcs, Polygons, Line Graphs, Bar Charts Using control Loops- Working with Color.

## **SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS**

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### **TEXT BOOKS:**

1. Elements of Numerical Analysis by Radhey S. Gupta Macmillan India Ltd, 2009
2. Programming with Java by E. Balagurusamy, Tata Mc Graw-Hill, 1999.
3. JAVA 2 The Complete Reference by Herbert Schildt, Tata Mc Graw-Hill Edition 2001

Unit 1- Text book 1- Chapter 3: [Section 3.3-3.8&3.8.1,3.8.2,3.8.3] (Pg: 90-104)

Unit 2- Text book 1-Chapter 6&Chapter 8: [Section 6.8-6.13, 6.15 & 8.1, 8.5-8.7&8.10-8.12] (Pg: 206- 210&214-230&269&272-283&298-302)

Unit 3- Text book 1- Chapter 11: [Section 11.1-11.5.1] (Pg: 374-382&394-399)

Unit 4- Text book 2- Chapter 4, 5, 6, 7, 8, 9: [Section 4.1-4.11&5.1-5.15&6.1-6.8&7.1-7.6&8.1- 8.17&9.1-9.6] (Pg: 47-63&66-82&88-107&111-126&129-152&155-169)

Unit 5- Text book 2- Chapter 14 &Chapter 15 [Section 14.1-14.16&15.1-15.9] (Pg: 237-262&263-279) Text book 3- Chapter 21 Pages 696 to 701.

### **REFERENCE BOOKS:**

1. Elementary Numerical Analysis by Samuel D. Conte and Carl de Boor, McGraw Hill, 1981
2. Introductory Methods of Numerical Methods by S. S. Sastry, Prentice – Hall India, 1994.
3. JAVA 2 The Complete Reference by Herbert Schildt, Tata Mc Graw-Hill Edition 2001
4. An Introduction to Numerical Analysis by Devi Prasad, Narosa Publishing House Pvt Ltd, Reprint 2008.
5. Advanced Java Programming by B. Prasanalakshmi, Published by Satish Kumar Jain for CBS Publishers and Distributors Pvt Ltd, 2015

## SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS

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<b>I – M.Sc (Maths)</b>	<b>PRACTICAL – NUMERICAL ANALYSIS WITH JAVA PROGRAMMING</b> <b>For the students admitted from the year 2023</b>	<b>PMTP21</b>
<b>SEMESTER – II</b>		<b>HRS/WK –2</b>
<b>CORE PRACTICAL– I</b>		<b>CREDIT – 2</b>

### OBJECTIVE:

This course introduces a Numerical Analysis for hands-on experience on computers.

### LIST OF PROGRAMS FOR PRACTICAL

1. Newton- Raphson method
2. Fixed–point iteration method
3. Secant method
4. Bisection method
5. Regula-Falsi method
6. Numerical Integration using Newton-Cotes Mid-point Formula
7. Numerical Integration using Newton-Cotes three-point Formula
8. Romberg Integration
9. Gaussian quadrature 2-point Formula
10. Gaussian quadrature 3-point Formula

### REFERENCE BOOKS:

1. Elements of Numerical Analysis by Radhey S. Gupta Macmillan India Ltd,2009
2. Programming with Java by E.Balagurusamy, Tata Mc Graw-Hill, 1999.

## SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS

<b>II – M.Sc (Maths)</b>	<b>COMPLEX ANALYSIS-I</b>	PMT31
<b>SEMESTER – III</b>	<b>For the students admitted from the year 2022</b>	<b>HRS/WK – 6</b>
<b>CORE – VIII</b>		<b>CREDIT – 5</b>

### OBJECTIVE:

The course aims to introduce the concepts of Complex Integration, Cauchy's Integral Formula, Calculus of Residues and Evaluation of Definite Integrals, Harmonic Functions, Power series expansions.

### COURSE OUTCOME:

At the end of the course students will be able to

CO1: apply calculus in complex domain.

CO2: apply cauchy's integral formula in evaluating complex integrals.

CO3: apply cauchy's theorem in evaluating integral in different domains.

CO4: apply cauchy's residue theorem in evaluating harder integral

CO5: compute the Taylor's and Laurent expansion of simple functions, determine the singularity .

SEMESTER III	COURSE CODE: PMT31					COURSE TITLE : COMPLEX ANALYSIS - I										HOURS	CREDITS
	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)										MEAN SCORE OF CO'S	
	P1	P2	P3	P4	P5	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10		
CO1	3	4	4	3	3	2	2	2	2	4	3	4	3	4	5	3.1	
CO2	3	4	3	3	3	2	2	2	2	5	4	5	4	5	5	3.5	
CO3	3	4	4	3	3	2	2	2	2	5	4	5	4	5	5	3.6	
CO4	3	4	4	3	3	2	2	2	4	4	3	5	3	2	5	3.2	
CO5	3	4	3	3	3	3	4	5	2	4	3	4	2	2	4	3.3	
Mean Overall Score															3.34		

Result: The Score of this Course is 3.34 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	$0 \leq \text{rating} \leq 1$	$1.1 \leq \text{rating} \leq 2$	$2.1 \leq \text{rating} \leq 3$	$3.1 \leq \text{rating} \leq 4$	$4.1 \leq \text{rating} \leq 5$
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

## **SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS**

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### **UNIT-I-COMPLEX INTEGRATION:**

Line Integrals, Rectifiable Arcs, Line Integrals as Functions of Arcs, Cauchy's Theorem for a Rectangle, Cauchy's theorem in a Disk, The Index of a Point with Respect to a Closed Curve.

### **UNIT-II CAUCHY'S INTEGRAL FORMULA:**

The Integral Formula, Higher Derivatives, Removable Singularities, Taylor's Theorem, Zeros And Poles, The Local Mapping, The Maximum Principle.

### **UNIT-III THE GENERAL FORM OF CAUCHY'S THEOREM AND THE CALCULUS OF RESIDUES:**

Chains and Cycles, Simple Connectivity, Homology, The General Statement of Cauchy's Theorem, Proof of Cauchy's Theorem, Locally Exact Differentials, Multiply Connected Regions. The Residue Theorem, The Argument Principle.

### **UNIT-IV DEFINITE INTEGRAL AND HARMONIC FUNCTION**

Evaluation of Definite Integrals. Definition and Basic Properties, The Mean-value Property, Poisson's Formula.

### **UNIT-V HARMONIC FUNCTION AND POWER SERIES EXPANSIONS**

Schwarz's Theorem, The Reflection Principle, Weierstrass's Theorem, The Taylor Series, The Laurent Series.

### **TEXT BOOK :**

1. Lars V. Ahlfors "COMPLEX ANALYSIS" (Third Edition), Mc GRAW- HILL International Editions-1979  
Unit-I Chapter 4: Sec 1.1 to 2.1(Pg: 101 to 117)  
Unit-II Chapter 4: Sec 2.2 to 3.4(Pg: 118 to 136)  
Unit-III Chapter 4:Sec 4.1 to 5.2(Pg: 137 to 154)  
Unit-IV Chapter 4:Sec 5.3 to 6.3(Pg: 154 to 168)  
Unit-V Chapter 4:Sec 6.4,6.5 Chapter 5:Sec 1.1 to 1.3(Pg: 168 to 173 & 175 to 186)

### **REFERENCE BOOKS:**

1. H.A Presly, "Introduction to Complex Analysis", Clarendon Press, Oxford, 1990.
2. J.B.Conway, " Functions of one complex variables, Springer- Verlag, International student edition, Naroser Publishing Co. 1978.
3. E.Hille, Analytic function theory, Gonn & Co., 1959.
4. M.Heins, " Complex function Theory", Academic Press, New York, 1968.

## SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS

<b>II – M.Sc (Maths)</b>	<b>NUMBER THEORY AND</b>	<b>PMT34</b>
<b>SEMESTER – III</b>	<b>CRYPTOGRAPHY</b>	<b>HRS/WK – 5</b>
<b>CORE – XI</b>	<b>For the students admitted form the year 2022</b>	<b>CREDIT – 3</b>

### OBJECTIVE:

The course aims to introduce the concept of divisibility and Euclidean algorithm, quadratics residues and reciprocity, encryption and decryption, primality test.

### COURSE OUTCOME:

At the end of the course students will able to

CO1: understand the divisibility and Euclidean algorithm.

CO2: understand quadratics residues and reciprocity.

CO3: analyze encryption and decryption.

CO4: understand the algorithm for finding discrete log.

CO5: do the primality test.

SEMESTER III	COURSE CODE: PMT34	COURSE TITLE: NUMBER THEORY AND CRYPTOGRAPHY														HOURS 5	CREDITS 3
COURSE OUTCOMES	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)										MEAN SCORE OF CO'S	
	P1	P2	P3	P4	P5	PS1	PS2	PS3	PS4	PS5	PS6	PS7	PS8	PS9	PS10		
CO1	3	4	4	3	3	4	5	5	2	4	3	5	2	3	4	3.6	
CO2	3	4	3	3	3	4	5	5	2	4	3	5	2	2	4	3.46	
CO3	3	4	4	3	3	4	4	5	2	4	3	5	2	2	4	3.46	
CO4	3	4	4	3	3	4	5	5	2	4	3	5	3	2	4	3.6	
CO5	3	4	3	3	3	4	5	5	2	4	3	5	2	2	4	3.46	
<b>Mean Overall Score</b>																<b>3.5</b>	

Result: The Score of this Course is 3.5 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very poor	Poor	Moderate	High	Very High

This course is having **HIGH** association with Programme outcomes and Programme specific outcomes.

**UNIT-I: SOME TOPICS IN ELEMENTARY NUMBER THEORY**

Time estimates for doing arithmetic-Divisibility and the Euclidean algorithm-  
Congruences-Modular exponentiation-Some applications to factoring.

**UNIT-II: QUADRATICS RESIDUES AND RECIPROCITY**

Quadratic residues-The Legendre Symbol- Law of Quadratic reciprocity-The Jacobi  
symbol.

**UNIT-III: CRYPTOGRAPHY**

Some simple crypto systems- Digraph transformation-Enciphering Matrices-Affine  
enciphering transformation.

**UNIT-IV: PUBLIC KEY**

RSA- Discrete log- Diffie-Hellman Key exchange-The massey- Omura cryptosystem-  
Digital signature standard- Algorithm for finding of discrete log in finite fields.

**UNIT-V: PRIMALITY AND FACTORING-I**

Pseudoprimes-Euler pseudoprimes- Strong pseudoprimes- Solovay- Strassen  
primality test- Miller-Rabin test- Rho method-Fermat factorization and factor bases.

**TEXT BOOK:**

1. Neal Koblitz, "A Course in number theory and Cryptography", 2<sup>nd</sup> Edition, Springer-  
Verlag, 1994.  
Unit I: Chapter 1: Sec (1.1, 1.2, 1.3, 1.4), Pg.No: 1-30.  
Unit II: Chapter 2: Sec (2.2), Pg.No: 42-53.  
Unit III: Chapter 3: Sec (3.1, 3.2), Pg.No: 54-82.  
Unit IV: Chapter 4: Sec (4.2, 4.3), Pg.No: 92-110.  
Unit V: Chapter 5: Sec (5.1, 5.2, 5.3), Pg.No: 125-143.

**REFERENCE BOOKS:**

1. Menezes A, "Van Oorschot and Vanstone S.A", "Hand book of applied Cryptography",  
CRC press, 1996.
2. Ivan Nivan, Herbert S. Zuckerman and Hugh L. Montgomery, "An Introduction to  
Theory of Number" John Wiley & Sons, Inc, 1991 ( 5<sup>th</sup> Edition)

## SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS

<b>II – M.Sc (Maths)</b>	<b>FUZZY SUBSETS AND ITS APPLICATION</b> <b>For the students admitted from the year 2022</b>	<b>EPMT35</b>
<b>SEMESTER – III</b>		<b>HRS/WK – 5</b>
<b>Elective – III</b>		<b>CREDIT – 3</b>

### OBJECTIVE:

This course aims to offer fuzzy graphs ,fuzzy relation ,fuzzy logic and fuzzy composition.

### COURSE OUTCOME:

At the end of the course students will be able to

CO1: acquire knowledge on the basic definitions and fundamentals of Fuzzy set theory.

CO2: get ideas on Fuzzy graphs and its properties

CO3: improve their ability in the concept of Fuzzy relations

CO4: attain knowledge of the Fuzzy Logic in different forms

CO5: understand the applications of Fuzzy logic

SEMESTER III	COURSE CODE  EPMT35	COURSE TITLE: FUZZY SUBSETS AND ITS APPLICATION														HOURS 5	CREDITS 3
COURSE OUTCOME S	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)										MEAN SCORE OF CO'S	
	P O 1	P O 2	P O 3	P O 4	P O 5	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	P S O 6	P S O 7	P S O 8	P S O 9	P S O 10		
CO1	4	3	4	3	3	4	3	3	4	3	3	4	4	4	4	3.5	
CO2	3	4	3	4	3	3	4	4	4	4	4	3	3	3	4	3.5	
CO3	4	3	4	3	4	3	4	4	3	4	4	4	4	3	3	3.6	
CO4	3	4	4	4	3	4	4	3	3	3	3	3	4	3	3	3.4	
CO5	4	3	3	3	4	3	3	4	3	4	4	3	3	4	4	3.5	
Mean Overall Score																3.5	

Result: The Score of this Course is 3.5 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	$0 \leq \text{rating} \leq 1$	$1.1 \leq \text{rating} \leq 2$	$2.1 \leq \text{rating} \leq 3$	$3.1 \leq \text{rating} \leq 4$	$4.1 \leq \text{rating} \leq 5$
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.



**UNIT –I: FUNDAMENTAL NOTION:**

Introduction –Review of the notion of membership-Concept of fuzzy subsets-Dominance relation-Simple operation- Set of fuzzy subsets for E and M finite - Properties of fuzzy subsets –Product and algebraic sum of two fuzzy subsets-problems.

**UNIT –II: FUZZY GRAPHS:**

Introduction – Fuzzy graphs –Fuzzy relation - Composition of Fuzzy relation – Fuzzy subsets induced by the mapping –Conditioned fuzzy subsets-Properties of fuzzy binary relation-Transitive closure – Paths in finite Fuzzy graphs - Problems .

**UNIT-III: FUZZY RELATION:**

Fuzzy Preorder relation –Similitude- Similitude sub relation –Anti symmetry –Fuzzy order relation – Anti-symmetry relations without loops-Ordinal relations- Ordinal functions-Dissimilitude –Resemblance –Properties of Similitude and Resemblance –Properties of Fuzzy perfect order relation –Problems.

**UNIT-IV: FUZZY LOGIC & APPLICATIONS:**

Introduction –Characteristic functions of a fuzzy subsets-Fuzzy variables –Polynomial forms –Analysis of function of Fuzzy variables –Method of Marinos –Logical structure-Application of Fuzzy subsets in the field of Engineering – Medical– Economics – Soft Computers.

**UNIT-V: CONSTRUCTING FUZZY SETS:**

Methods of Construction : An overview – Direct methods with one expert – Direct method with multiple experts – indirect method with multiple experts and one expert – Construction from sample data.

**TEXT BOOKS:**

1. A. Kaufman”Introduction to the theory of Fuzzy subsets”, Vol I,( 1975) Academic Press, New York,. (For unit – I to unit IV)  
Unit 1 Chapter 1: sec 1 to 9, (Pg no : 1 - 40)  
Unit 2 Chapter 2: sec10 to 18, (Pg no : 41 – 99)  
Unit 3 Chapter 2: sec 19 to 29, (Pg no : 99 – 179)  
Unit 4 Chapter 3: sec 31 to 35 (Pg no: 191 – 214)
2. George J. Klir and Bo Yuan, “Fuzzy sets and Fuzzy Logic Theory and Applications”, ( 2001) Prentice Hall India, New Delhi,.  
Unit 5 Chapter 10: Sections 10.1 to 10.7

**REFERENCE BOOKS:**

1. H. J. Zimmermann, “Fuzzy set Theory and its Applications”,( 1996.) Allied Publications, Chennai,
2. Dr. Sudhir K. Pundir and Dr. Rimple Pundir, Fuzzy sets and their Applications, 2004, Pragathi Prakashan, Meerut.

## SYLLABUS - PG AND RESEARCH DEPARTMENT OF MATHEMATICS

<b>II – M.Sc (Maths)</b>	<b>COMPLEX ANALYSIS-II</b>	PMT41
<b>SEMESTER – IV</b>	<b>For the students admitted from the year 2022</b>	<b>HRS/WK – 6</b>
<b>CORE – XII</b>		<b>CREDIT – 5</b>

### OBJECTIVE:

The course aims to introduce the concepts of Power Series Expansions, Jensen’s Formula, The Riemann Zeta Function, Arzela’s Theorem, The Riemann Mapping Theorem, Conformal Mapping of Polygons, Simply Periodic Functions, Doubly Periodic Functions and The Weierstrass Theory

### COURSE OUTCOME:

At the end of the course students will be able to

C01: manipulate and explicit Gamma function & Jensen’s formula.

C02: understand the Riemann zeta functions and its role in application of complex analysis to number theory.

C03: apply Normality, Equi- continuity, compactness properties of family of analytic function.

C04: apply Schwarz-Christoffel formula & Harnack’s principle .

C05: understand Unimodular Transformation and properties of elliptic functions.

SEMESTER IV	COURSE CODE: PMT41	COURSE TITLE : COMPLEX ANALYSIS –II														HOURS 6	CREDITS 5
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)	PROGRAMME SPECIFIC OUTCOMES(PSO)														MEAN SCORE OF CO’S	
	P O 1	P O 2	P O 3	P O 4	P O 5	P S O 1	P S O 2	P S O 3	P S O 4	P S O 5	P S O 6	P S O 7	P S O 8	P S O 9	PSO10		
CO1	3	3	4		3	2	3	3	3	3	3	4	3	2	4	3.1	
CO2	3	4	4	3	3	2	2		3	4	3	5	2	3	5	3.3	
CO3	3	4	4	3	3	2	3	4	2	4	5	4	3	2	5	3.0	
CO4	3	4	5	3	3	2	3	4	2	4	3	4	2	3	5	3.1	
CO5	3	4	4	3	3	3	4	4	2	4	3	4	2	2	5	3.3	
Mean Overall Score															3.16		

Result: The Score of this Course is 3.16 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	$0 \leq \text{rating} \leq 1$	$1.1 \leq \text{rating} \leq 2$	$2.1 \leq \text{rating} \leq 3$	$3.1 \leq \text{rating} \leq 4$	$4.1 \leq \text{rating} \leq 5$
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

**UNIT-I: POWER SERIES EXPANSIONS:**

Partial Fractions, Infinite Products, Canonical Products, The Gamma Function, Jensen's Formula.

**UNIT-II: ENTIRE FUNCTIONS:**

Hadamard's Theorem, The Product Development, Extension of  $\zeta(s)$  to the Whole Plane, The Functional Equation, The Zeros of the Zeta Function.

**UNIT-III: NORMAL FAMILIES:**

Equicontinuity, Normality and Compactness, Arzela's Theorem, Families of Analytic Functions, The Classical Definition. The Riemann Mapping Theorem, Boundary Behavior, Use of the Reflection Principle.

**UNIT-IV: CONFORMAL MAPPING OF POLYGONS:**

The Behavior at an Angle, The Schwarz-Christoffel formula, Mapping on a Rectangle, Functions with the Mean-Value Property, Harnack's principle, Representation by Exponentials, The Fourier Development, Functions of Finite Order.

**UNIT-V: DOUBLY PERIODIC FUNCTIONS:**

The Period Module, Unimodular Transformations, The Canonical Basis, General Properties of Elliptic Functions. The Weierstrass  $\wp$  function, The Functions  $\zeta(z)$  and  $\sigma(z)$ , The Differential Equation.

**TEXT BOOK:**

Lars V. Ahlfors "COMPLEX ANALYSIS" (Third Edition), Mc GRAW- HILL International Editions-1979

Unit-I Chapter 5: Sec 2.1 to 2.4, 3.1 (Pg: 187 to 200, 206 to 208)

Unit-II Chapter 5: Sec 3.2 to 4.4 (Pg: 208 to 218)

Unit-III Chapter 5: Sec 5.1 to 5.5, Chapter 6: Sec 1.1 to 1.3 (Pg: 219 to 227, 229 to 234)

Unit-IV Chapter 6: Sec 2.1 to 2.3, 3.1, 3.2, Chapter 7: Sec 1.1 to 1.3 (Pg: 235 to 244, 263 to 265)

Unit-V Chapter 7: Sec 2.1 to 2.4, 3.1 to 3.3 (Pg: 265 to 276)

**REFERENCE BOOKS:**

1. H.A Presfly, "Introduction to Complex Analysis", Clarendon Press, Oxford, 1990.
2. J.B. Conway, "Functions of one complex variables, Springer- Verlag, International student edition, Naroser Publishing Co. 1978.
3. E.Hille, Analytic function theory, Gonn& Co., 1959.
4. M.Heins, "Complex function Theory, Academic Press, New York

PG AND RESEARCH DEPARTMENT OF PHYSICS								
CURRICULUM TEMPLATE-(2023-2026)								
a. B.Sc., Physics								
SEMESTER - I								
Part		Hours/ Week	Credit	Course Code	Course Title	Maximum Marks		
						CIA	ESE	TOTAL
III	Core Theory - 1	5	5	PH101A	Properties of matter and Sound	25	75	100
III	Core Practical - 1	3	3	PHP101A	Main Practical – I	40	60	100
III	Foundation Course	2	2	FPH101	Introductory Physics	25	75	100
IV	SEC-1(NME)	2	2	NPH101	Home Electrical Installation	25	75	100

SEMESTER – IV								
III	SDC-2	4	2	NEW CODE	Office Fundamentals	100		100

SEMESTER – VI								
Part		Hours/ Week	Credit	Course Code	Course Title	Maximum Marks		
						CIA	ESE	TOTAL
III	Elective -3	4	3		Basics of Nanoscience	25	75	100

<b>I B.Sc (PH)</b>	<b>PROPERTIES OF MATTER AND SOUND</b>	<b>PH101A</b>
<b>SEMESTER – I</b>		<b>HRS/WK - 5</b>
<b>CORE -1</b>		<b>CREDIT - 5</b>

**OBJECTIVE:**

Study of the properties of matter leads to information which is of practical value to both the physicist and the engineers. It gives us information about the internal forces which act between the constituent parts of the substance. Students who undergo this course are successfully bound to get a better insight and understanding of the subject.

**COURSE OUTCOMES (CO):**

**At the end of the Course the students should be able to exhibit**

- CO1:** Relate elastic behavior in terms of three moduli of elasticity and working of torsion pendulum.
- CO2:** Able to appreciate concept of bending of beams and analyze the expression, quantify and understand nature of materials.
- CO3:** Explain the surface tension and viscosity of fluid and support the interesting phenomena associated with liquid surface, soap films provide an analogue solution to many engineering problems.
- CO4:** Analyze simple harmonic motions mathematically and apply them. Understand the concept of resonance and use it to evaluate the frequency of vibration. Set up experiment to evaluate frequency of ac mains
- CO5:** Understand the concept of acoustics, importance of constructing buildings with good acoustics.  
Able to apply their knowledge of ultrasonics in real life, especially in medical field and assimilate different methods of production of ultrasonic waves

**MAPPING WITH PROGRAM OUT COMES:**

Map course outcomes (CO) for each course with program outcomes (PO) in the 3-point scale of STRONG(S),MEDIUM(M)andLOW(L).

	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>
<b>CO1</b>	S	S	M	M	S	M	M	S	M	S
<b>CO2</b>	M	S	S	S	M	M	S	M	S	S
<b>CO3</b>	S	M	S	M	S	S	M	S	S	S
<b>CO4</b>	S	S	S	S	S	M	S	M	M	M
<b>CO5</b>	M	M	S	S	M	S	S	S	S	M

**UNIT- I****(15 Hours)**

**ELASTICITY:** Hooke's law – stress-strain diagram – elastic constants –Poisson's ratio – relation between elastic constants and Poisson's ratio – work done in stretching and twisting a wire – twisting couple on a cylinder – rigidity modulus by static torsion– torsional pendulum (with and without masses)

**UNIT- II****(15 Hours)**

**BENDING OF BEAMS:** Cantilever– expression for Bending moment – expression for depression at the loaded end of the cantilever– oscillations of a cantilever – expression for time period – experiment to find Young's modulus – non-uniform bending– experiment to determine Young's modulus by Koenig's method – uniform bending – expression for elevation – experiment to determine Young's modulus using microscope

**UNIT- III****(15 Hours)**

**FLUID DYNAMICS:** Surface tension: definition – molecular forces– excess pressure over curved surface – application to spherical and cylindrical drops and bubbles – determination of surface tension by Jaegar's method–variation of surface tension with temperature

Viscosity: definition – streamline and turbulent flow – rate of flow of liquid in a capillary tube – Poiseuille's formula –corrections – terminal velocity and Stoke's formula– variation of viscosity with temperature

**UNIT- IV****(15 Hours)**

**WAVES AND OSCILLATIONS:** Simple Harmonic Motion (SHM) – differential equation of SHM – graphical representation of SHM – composition of two SHM in a straight line and at right angles – Lissajous's figures- free, damped, forced vibrations –resonance and Sharpness of resonance. Laws of transverse vibration in strings –sonometer – determination of AC frequency using sonometer –determination of frequency using Melde's string apparatus

**UNIT- V****(15 Hours)****ACOUSTICS OF BUILDINGS AND ULTRASONICS:**

Intensity of sound – decibel – loudness of sound –reverberation – Sabine's reverberation formula – acoustic intensity – factors affecting the acoustics of buildings. Ultrasonic waves: production of ultrasonic waves – Piezoelectric crystal method – magnetostriction effect – application of ultrasonic waves

**TEXT BOOKS:**

1. D.S.Mathur, 2010, Elements of Properties of Matter, S.Chand & Co.
2. BrijLal & N. Subrahmanyam, 2003, Properties of Matter, S.Chand & Co
3. D.R.Khanna & R.S.Bedi, 1969, Textbook of Sound, AtmaRam & sons
4. BrijLal and N.Subrahmanyam, 1995, A Text Book of Sound, Second revised edition, Vikas Publishing House.
5. R.Murugesan, 2012, Properties of Matter, S.Chand & Co.

**REFERENCE BOOKS:**

1. C.J. Smith, 1960, General Properties of Matter, Orient Longman Publishers
2. H.R. Gulati, 1977, Fundamental of General Properties of Matter, Fifth edition, R. Chand & Co.

3. A.P French, 1973, Vibration and Waves, MIT Introductory Physics, Arnold-Heinmann India.

**WEBLINKS**

1. <https://www.biolinscientific.com/blog/what-are-surfactants-and-how-do-they-work>
2. <http://hyperphysics.phy-astr.gsu.edu/hbase/permot2.html>
3. <https://www.youtube.com/watch?v=gT8Nth9NWPM>
4. <https://www.youtube.com/watch?v=m4u-SuaSu1s&t=3s>
5. <https://www.biolinscientific.com/blog/what-are-surfactants-and-how-do-they-work>
6. <https://learningtechnologyofficial.com/category/fluid-mechanics-lab/>
7. <http://www.sound-physics.com/>
8. <http://nptel.ac.in/courses/112104026/>

<b>I B.Sc (PH)</b>	<b>INTRODUCTORY PHYSICS</b>	<b>FPH101</b>
<b>SEMESTER - I</b>		<b>HRS/WK - 2</b>
<b>FOUNDATION COURSE</b>		<b>CREDIT - 2</b>

**OBJECTIVE:**

To help students get an overview of Physics before learning their core courses. To serve as a bridge between the school curriculum and the degree programme.

**COURSE OUTCOMES:**

**At the end of the Course the students should be able to exhibit**

**CO1:** Apply concept of vectors to understand concepts of Physics and solve problems

**CO2:** Appreciate different forces present in Nature while learning about phenomena related to these different forces.

**CO3:** Quantify energy in different process and relate momentum, velocity and energy

**CO4:** Differentiate different types of motions they would encounter in various courses and understand their basis

**CO5:** Relate various properties of matter with their behaviour and connect them with different physical parameters involved.

**MAPPING WITH PROGRAM OUTCOMES:**

Map course outcomes (CO) for each course with program outcomes (PO) in the 3-point scale of STRONG(S), MEDIUM(M) and LOW(L).

	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>
<b>CO1</b>	S	S	S	S	S	S	S	M	S	M
<b>CO2</b>	M	S	S	S	M	S	S	M	M	M
<b>CO3</b>	S	S	S	M	S	S	S	M	S	M
<b>CO4</b>	S	S	S	S	S	S	S	M	M	M
<b>CO5</b>	S	M	S	S	S	S	S	M	M	S

**UNIT - I**

**(6 Hours)**

vectors, scalars –examples for scalars and vectors from physical quantities – addition, subtraction of vectors – resolution and resultant of vectors – units and dimensions– standard physics constants

**UNIT - II**

**(6 Hours)**

different types of forces–gravitational, electrostatic, magnetic, electromagnetic, nuclear – mechanical forces like, centripetal, centrifugal, friction, tension, cohesive, adhesive forces

**UNIT - III**

**(6 Hours)**

different forms of energy– conservation laws of momentum, energy – types of collisions –angular momentum– alternate energy sources–real life examples

**UNIT - IV**

**(6 Hours)**

types of motion– linear, projectile, circular, angular, simple harmonic motions – satellite motion –



banking of a curved roads – stream line and turbulent motions – wave motion – comparison of light and sound waves – free, forced, damped oscillations

**UNIT - V**

**(6 Hours)**

surface tension – shape of liquid drop – angle of contact – viscosity –lubricants – capillary flow – diffusion – real life examples– properties and types of materials in daily use- conductors, insulators – thermal and electric

**TEXT BOOKS:**

1. D.S.Mathur, 2010, Elements of Properties of Matter, S.Chand & Co
2. BrijLal & N. Subrahmanyam, 2003, Properties of Matter, S.Chand & Co.

**REFERENCE BOOKS:**

1. H.R. Gulati, 1977, Fundamental of General Properties of Matter, Fifth edition, S.Chand & Co.

**WEBLINKS**

1. <http://hyperphysics.phy-astr.gsu.edu/hbase/permot2.html>
2. <https://science.nasa.gov/ems/>
3. [https://eesc.columbia.edu/courses/ees/climate/lectures/radiation\\_hays/](https://eesc.columbia.edu/courses/ees/climate/lectures/radiation_hays/)

<b>I B.Sc (PH)</b>	<b>HOME ELECTRICAL INSTALLATION</b>	<b>NPH101</b>
<b>SEMESTER – I</b>		<b>HRS/WK – 2</b>
<b>Skill Enhancement Course</b>		<b>CREDIT –2</b>

**OBJECTIVE:**

The students will get knowledge on electrical instruments, installations and domestic wiring techniques with safety precautions and servicing.

**UNIT- I (6 Hours)**

**SIMPLE ELECTRICAL CIRCUITS:** charge, current, potential difference, resistance – simple electrical circuits – DC ammeter, voltmeter, ohmmeter – Ohm’s law – difference between DC and AC – advantages of AC over DC – electromagnetic induction - transformers – inductors/chokes – capacitors/condensers – impedance – AC ammeter, voltmeter –symbols and nomenclature

**UNIT- II (6 Hours)**

**TRANSMISSION OF ELECTRICITY:** production and transmission of electricity – concept of power grid – Series and parallel connections – technicalities of junctions and loops in circuits – transmission losses (qualitative) – roles of step-up and step-down transformers – quality of connecting wires – characteristics of single and multicore wires

**UNIT- III (6 Hours)**

**ELECTRICAL WIRING:** different types of switches – installation of two way switch – role of sockets, plugs, sockets - installation of meters – basic switch board – electrical bell – indicator – fixing of tube lights and fans – heavy equipment like AC, fridge, washing machine, oven, geyser, jet pumps – provisions for inverter – gauge specifications of wires for various needs

**UNIT- IV (6 Hours)**

**POWER RATING AND POWER DELIVERED:** conversion of electrical energy in to different forms – work done by electrical energy – power rating of electrical appliances – energy consumption – electrical energy unit in kWh – calculation of EB bill – Joule’s heating – useful energy and energy loss – single and three phase connections – Measures to save electrical energy – energy audit

**UNIT- V (6 Hours)**

**SAFETY MEASURES:** insulation for wires – colour specification for mains, return and earth – Understanding of fuse and circuit breakers – types of fuse: kit-kat, HRC, cartridge, MCB, ELCB – purpose of earth line – lighting arrestors – short circuiting and over loading – electrical safety – tips to avoid electrical shock – first aid for electrical shock – fire safety for electric current

**TEXT BOOKS:**

1. Wiring a House: 5th Edition by Rex Cauldwell, (2014).
2. Black & Decker Advanced Home Wiring, 5th Edition: Backup Power - Panel Upgrades - AFCI Protection - "Smart" Thermostats, by Editors of Cool Springs Press, (2018).
3. Complete Beginners Guide to Rough in Electrical Wiring: by Kevin Ryan (2022).

<b>YEAR – I</b>	<b>MAIN PRACTICAL – I</b>	<b>PHP101A</b>
<b>SEMESTER – I</b>		<b>HRS/WK – 3</b>
<b>CORE – PRACTICAL - 1</b>		<b>CREDIT – 3</b>

1. Determination of rigidity modulus without mass using Torsional pendulum.
2. Determination of rigidity modulus with masses using Torsional pendulum.
3. Determination of moment of inertia of an irregular body.
4. Verification of parallel axes theorem on moment of inertia.
5. Verification of perpendicular axes theorem on moment of inertia.
6. Determination of moment of inertia and g using Bifilar pendulum.
7. Determination of Young's modulus by stretching of wire with known masses.
8. Verification of Hook's law by stretching of wire method.
9. Determination of Young's modulus by uniform bending – load depression graph.
10. Determination of Young's modulus by non-uniform bending – scale & telescope.
11. Determination of Young's modulus by cantilever – load depression graph.
12. Determination of Young's modulus by cantilever – oscillation method
13. Determination of Young's modulus by Koenig's method – ( or unknown load)
14. Determination of rigidity modulus by static torsion.
15. Determination of Y, n and K by Searle's double bar method.
16. Determination of surface tension & interfacial surface tension by drop weight method.
17. Determination of co-efficient of viscosity by Stokes' method – terminal velocity.
18. Determination of critical pressure for streamline flow.
19. Determination of Poisson's ratio of rubber tube.
20. Determination of viscosity by Poiseuille's flow method.
21. Determination of radius of capillary tube by mercury pellet method.
22. Determination of g using compound pendulum. Young's modulus by non-uniform bending – Pin and microscope.
23. Young's modulus by non-uniform bending – Optic lever.
24. Rigidity modulus – Torsional pendulum – n of a wire (without masses).
25. Sonometer – Determination of frequency of tuning fork.
26. Sonometer – Determination of specific gravity of solid and liquid.
27. Surface tension by drop weight and interfacial liquid – Drop weight method.
28. Focal length and refractive index of convex lens (u-v method and conjugate foci method for 'f' and Boy's method for R).
29. Spectrometer -  $\mu$  of the hollow prism.
30. Specific heat capacity of liquid by Newton's laws of cooling.
31. Potentiometer – Calibration of low range voltmeter.

III B.Sc (PH)	OFFICE FUNDAMENTALS	NEW CODE
SEMESTER - IV		HRS/WK-3
SDC-2		CREDIT- 2

**OBJECTIVE:**

To study appreciation programme for the common man, uses of computer for basic purpose, introduction to Origin software and Adobe Photoshop.

**COURSE OUTCOMES:**

**At the end of the Course the students should be able to exhibit**

**CO1:**Impart basic level appreciation programme for the common man

**CO2:** Use the computer for basic purposes of preparing his personnel/business letters

**CO3:**Understand the usage of spread sheet

**CO4:** Be familiar with making small presentations

**CO5:** Implement the knowledge of office fundamentals

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER - IV	COURSE CODE:					COURSE TITLE: OFFICE FUNDAMENTALS						Hours: 3	Credits: 2
Course Outcomes COs	Programme Outcomes POs					Programme Specific Outcomes PSOs						Mean Score of CO's	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6		
CO1	3.2	2.8	4.1	3.5	3	2.8	3.5	3.1	4	3.4	3.2	3.32	
CO2	3.5	3.2	3	3	3.5	3.6	4	3.6	3	2.6	3.5	3.31	
CO3	3.5	4.2	3.2	2.8	3	3.2	3	3.5	3.7	3.5	3.2	3.34	
CO4	3.2	3.6	3	4	3	3.5	3.5	2.8	3.5	3.1	3.6	3.34	
CO5	4.1	3.5	3.7	3.2	3.5	2.5	3.5	3	4.1	3.2	3.5	3.43	
Mean Overall Score												3.34	

**Result: The Score for this course is 3.34 (High)**

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High
<b>Value Scaling</b>					
Mean Score of COs= $\frac{\text{Total Values}}{\text{Total No. of POs \& PSOs}}$			Mean Overall Score of COs= $\frac{\text{Total Mean Scores}}{\text{Total No. of COs}}$		

This course is having **High** association with Programme Outcome and Programme Specific Outcome

**UNIT - I****(12 Hours)**

**Computer, Communications And Collaboration:** Introduction - Components of Computer System -Concept of Hardware and Software -Application Software-Systems software-Concept of computing, data and information- Applications of IECT - e-governance - Connecting keyboard, mouse, monitor and printer to CPU - Checking power supply-Operating system -The User Interface -Task Bar-Icons-Menu-Running an Application. Introduction- Basics of E-mail- Using E-mails -Opening Email account-Mailbox: Inbox and Outbox -Creating and sending a new E-mail - Replying to an E-mail message -Forwarding an E-mail message -Sorting and Searching emails-document collaboration -Netiquettes

**UNIT - II****(12 Hours)**

**Understanding Word Processing:** Introduction-Opening Word Processing Package -Menu Bar-Using The Help -Using The Icons Below Menu Bar-Opening and closing Documents - Opening Documents- Save and Save as -Page Setup -Print Preview -Printing of documents -Text Creation and manipulation -Document Creation -Editing Text - Text Selection -Cut, Copy and Paste -Spell check-Thesaurus -Formatting the Text- Font and Size selection -Alignment of Text - Paragraph Indenting -Bullets and Numbering -Changing case -Table Manipulation -Draw Table - Changing cell width and height -Alignment of Text in cell -Delete / Insertion of row and column -Border and shading

**UNIT - III****(12 Hours)**

**Using Spread Sheet:** Introduction -Elements of Electronic Spread Sheet-Opening of Spread Sheet-Addressing of Cells-Printing of Spread Sheet-Saving Workbooks-Manipulation of Cells - Entering Text, Numbers and Dates -Creating Text, Number and Date Series- Editing Worksheet Data-Inserting and Deleting Rows, Column -Changing Cell Height and Width-Formulae and Function-Using Formulae-Function

**UNIT - IV****(12 Hours)**

**Making Small Presentations:** Introduction - Using PowerPoint -Opening A PowerPoint Presentation- Saving A Presentation -Creation of Presentation-Creating a Presentation Using a Template-Creating a Blank Presentation-Entering and Editing Text-Inserting And Deleting Slides in a Presentation-Preparation of Slides-Inserting Word Table or An Excel Worksheet-Adding Clip Art Pictures-Inserting Other Objects-Resizing and Scaling an Object -Presentation of Slides-Viewing A Presentation-Choosing a Set Up for Presentation-Printing Slides And Handouts-Slide Show -Running a Slide Show-Transition and Slide Timings - Automating a Slide Show

**UNIT - V****(12 Hours)**

**Applications:** Creation of word documents (Various Alignments, Table Manipulation) - Creation of Worksheets (Formulae/Function, shortcuts) using Excel - Creating PowerPoint Presentations (Different Templates, Themes, Styles, Transitions, Animation), Recording & Inserting (video/ audio slides) .

**TEXT BOOKS:**

1. Lisa Ruffolo Dolores Wells, Computer Literacy BASICS ,Course Technology Inc, 2014.
2. Peter Weverka, Office 365 All-in-One,2019

**REFERENCE BOOKS:**

1. Fundamentals of Computers by ReemaThareja from Oxford University Press
2. Photoshop: Beginner's Guide for Photoshop - Digital Photography, Photo Editing, Color Grading& Graphic...19 February 2016 by David Maxwell.

<b>III B.Sc (PH)</b>	<b>BASICS OF NANOSCIENCE</b>	
<b>SEMESTER - VI</b>		<b>HRS/WK-4</b>
<b>ELECTIVE – III Option(III)</b>		<b>CREDIT- 3</b>

**UNIT – I (12 hours)**

**INTRODUCTION TO NANOPARTICLES**

Introduction – Historical perspective – Classification based on dimension: zero dimensions, one dimension, two dimension & three dimension – Classification based on materials: Carbon based materials, metal based materials, Dendrimers, Composites – Quantum size effect – Surface to Volume ratio.

**UNIT – II (12 hours)**

**SYNTHESIS OF NANOMATERIALS**

Synthesis approach: Bottom-up Synthesis-Top-down Approach: Co-Precipitation, Ultrasonication, Mechanical Milling, Colloidal routes, Self-assembly, Vapour phase deposition, MOCVD, Sputtering, Evaporation.

**UNIT – III (12 hours)**

Nanoforms of Carbon - Buckminster fullerene- graphene and carbon nanotube, Single wall carbon Nanotubes (SWCNT) and Multi wall carbon nanotubes (MWCNT)- Ferrites, Nanoclays- Quantum wires, Quantum dots.

**UNIT – IV (12 hours)**

**CHARACTERIZATION TECHNIQUES**

X-ray diffraction technique, Scanning Electron Microscopy - environmental techniques, Transmission Electron Microscopy including high-resolution imaging, Surface Analysis techniques- AFM.

**UNIT – V (12 hours)**

**APPLICATIONS**

NanoInfoTech, nanocomputer, nanocrystal, Nanobiotechnology: nanoprobes in medical diagnostics and biotechnology, Nano medicines, Targeted drug delivery, Bioimaging - Micro Electro Mechanical Systems (MEMS), Nano Electro Mechanical Systems (NEMS)-Nanosensors.

**TEXT BOOKS:**

1. Nano: The Essentials by T. Pradeep, Mc. Graw Hill Education.
2. Nano materials A.K. Bandyopadhyay

**REFERENCE BOOKS:**

1. Pradeep, T. (2017). Nano:The Essentials: Understanding Nanoscience and Nanotechnology. McGraw Hill Education.
2. David.B. Williams and C. Barry Carter (2016) Transmission Electron microscopy : A
3. Textbook for Materials Science, Springer International Publishing Switzerland

PG AND RESEARCH DEPARTMENT OF PHYSICS									
CURRICULUM TEMPLATE (2023-2025)									
b. M.Sc., Physics									
SEMESTER – I									
S.No	Part		Hours/Week	Credit	Course Code	Course Title	Maximum Marks		
							CIA	ESE	TOTAL
1	III	Core Theory-1	7	5	PPH11B	Mathematical Physics	25	75	100
2	III	Core Theory-2	5	5	PPH12B	Classical Mechanics and Relativity	25	75	100
3	III	Core Theory-3	5	4	PPH13B	Linear and Digital ICs and Applications	25	75	100
4	III	Elective - 1(List-1)	5	3	EPPH14A	Analysis of Crystal structures	25	75	100



<b>I M.Sc.(PH)</b>	<b>MATHEMATICAL PHYSICS</b>	<b>PPH11B</b>
<b>SEMESTER - I</b>		<b>HRS/WK-7</b>
<b>CORE – I</b>		<b>CREDIT-5</b>

**OBJECTIVES:**

- To equip students with the mathematical techniques needed for understanding theoretical treatment in different courses taught in their program
- To extend their manipulative skills to apply mathematical techniques in their fields
- To help students apply Mathematics in solving problems of Physics

**COURSE OUTCOMES (CO):**

**CO1:** Understand use of bra-ket vector notation and explain the meaning of complete orthonormal set of basis vectors, and transformations and be able to apply them

**CO2:** Able to understand analytic functions, do complex integration, by applying Cauchy Integral Formula. Able to compute many real integrals and infinite sums via complex integration.

**CO3:** Analyze characteristics of matrices and its different types, and the process of diagonalization.

**CO4:** Solve equations using Laplace transform and analyze the Fourier transformations of different function, grasp how these transformations can speed up analysis and correlate their importance in technology

**CO5:** To find the solutions for physical problems using linear differential equations and to solve boundary value problems using Green’s function. Apply special functions in computation of solutions to real world problems.

**MAPPING WITH PROGRAM OUTCOMES:**

Map course outcomes (CO) for each course with program outcomes (PO) and program specific outcomes (PSO) in the 3-point scale of STRONG (3), MEDIUM (2) and LOW (1).

	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>
<b>CO1</b>	3	3	3	3	3	3	3	2	3	2
<b>CO2</b>	2	3	3	3	3	3	3	2	2	2
<b>CO3</b>	3	3	3	2	2	3	3	2	3	2
<b>CO4</b>	3	3	3	3	2	3	3	2	2	2
<b>CO5</b>	3	2	3	3	2	3	3	2	2	3

	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>	<b>PSO6</b>	<b>PSO7</b>	<b>PSO8</b>	<b>PSO9</b>	<b>PSO10</b>
<b>CO1</b>	3	3	3	3	3	3	3	2	3	2
<b>CO2</b>	2	3	3	3	3	3	3	2	2	2
<b>CO3</b>	3	3	3	2	2	3	3	2	3	2
<b>CO4</b>	3	3	3	3	2	3	3	2	2	2
<b>CO5</b>	3	2	3	3	2	3	3	2	2	3

**UNIT – I LINEAR VECTOR SPACE (18 Hours)**

Basic concepts – Definitions- examples of vector space – Linear independence - Scalar product- Orthogonality – Gram-Schmidt orthogonalization procedure –linear operators – Dual space- ket and bra notation – orthogonal basis – change of basis – Isomorphism of vector space – projection operator –Eigen values and Eigen functions – Direct sum and invariant subspace – orthogonal transformations and rotation

**UNIT – II COMPLEX ANALYSIS (18 Hours)**

Review of Complex Numbers -de Moivre's theorem-Functions of a Complex Variable- Differentiability -Analytic functions- Harmonic Functions- Complex Integration- Contour Integration, Cauchy – Riemann conditions – Singular points – Cauchy's Integral Theorem and integral Formula -Taylor's Series - Laurent's Expansion- Zeros and poles – Residue theorem and its Application: Potential theory - (1) Electrostatic fields and complex potentials - Parallel plates, coaxial cylinders and an annular region (2) Heat problems - Parallel plates and coaxial cylinders.

**UNIT – III MATRICES (18 Hours)**

Types of Matrices and their properties, Rank of a Matrix -Conjugate of a matrix - Adjoint of a matrix - Inverse of a matrix - Hermitian and Unitary Matrices -Trace of a matrix- Transformation of matrices - Characteristic equation - Eigen values and Eigen vectors - Cayley–Hamilton theorem –Diagonalization

**UNIT – IV FOURIER TRANSFORMS & LAPLACE TRANSFORMS (18 Hours)**

Definitions -Fourier transform and its inverse - Transform of Gaussian function and Dirac delta function -Fourier transform of derivatives - Cosine and sine transforms - Convolution theorem. Application: Diffusion equation: Flow of heat in an infinite and in a semi - infinite medium - Wave equation: Vibration of an infinite string and of a semi - infinite string.

Laplace transform and its inverse - Transforms of derivatives and integrals – Differentiation and integration of transforms - Dirac delta functions - Application - Laplace equation: Potential problem in a semi - infinite strip

**UNIT – V DIFFERENTIAL EQUATIONS (18 Hours)**

Second order differential equation- Sturm-Liouville's theory - Series solution with simple examples - Hermite polynomials - Generating function - Orthogonality properties - Recurrence relations – Legendre polynomials - Generating function - Rodrigue formula – Orthogonality properties - Dirac delta function- One dimensional Green's function and Reciprocity theorem - Sturm-Liouville's type equation in one dimension & their Green's function.

**UNIT VI: PROFESSIONAL COMPONENTS (15 Hours)**

Expert Lectures, Online Seminars - Webinars on Industrial Interactions/Visits, Competitive Examinations, Employable and Communication Skill Enhancement, Social Accountability and Patriotism

**TEXT BOOKS:**

1. George Arfken and Hans J Weber, 2012, *Mathematical Methods for Physicists – A Comprehensive Guide* (7th edition), Academic press.
2. P.K. Chattopadhyay, 2013, *Mathematical Physics* (2<sup>nd</sup> edition), New Age, New Delhi

3. A W Joshi, 2017, Matrices and Tensors in Physics, 4th Edition (Paperback), New Age International Pvt.Ltd., India
4. B. D. Gupta, 2009, *Mathematical Physics* (4<sup>th</sup> edition), VikasPublishing House, New Delhi.
5. H. K. Dass and Dr. Rama Verma, 2014, Mathematical Physics, Seventh Revised Edition, S. Chand & Company Pvt. Ltd., New Delhi.

**REFERENCE BOOKS:**

1. E. Kreyszig, 1983, Advanced Engineering Mathematics, Wiley Eastern, New Delhi,
2. D. G. Zill and M. R. Cullen, 2006, Advanced Engineering Mathematics, 3rd Ed. Narosa, New Delhi.
3. S. Lipschutz, 1987, Linear Algebra, Schaum's Series, McGraw - Hill, New York
3. E. Butkov, 1968, Mathematical Physics Addison - Wesley, Reading, Massachusetts.
4. P. R. Halmos, 1965, Finite Dimensional Vector Spaces, 2nd Edition, Affiliated EastWest, New Delhi.
5. C. R. Wylie and L. C. Barrett, 1995, Advanced Engineering Mathematics, 6 th Edition, International Edition, McGraw-Hill, New York

**WEB SOURCES**

1. [www.khanacademy.org](http://www.khanacademy.org)
2. [https://youtu.be/LZnRlOA1\\_2I](https://youtu.be/LZnRlOA1_2I)
3. <http://hyperphysics.phy-astr.gsu.edu/hbase/hmat.html#hmath>
4. [https://www.youtube.com/watch?v=2jymuM7OUU&list=PLhkiT\\_RYTEU27vS\\_SIED56gNjVJGO2qaZ](https://www.youtube.com/watch?v=2jymuM7OUU&list=PLhkiT_RYTEU27vS_SIED56gNjVJGO2qaZ)
5. <https://archive.nptel.ac.in/courses/115/106/115106086/>

<b>I M.Sc. (PH)</b>	<b>CLASSICAL MECHANICS AND RELATIVITY</b>	<b>PPH12B</b>
<b>SEMESTER - I</b>		<b>HRS/WK-5</b>
<b>CORE – II</b>		<b>CREDIT-5</b>

**OBJECTIVES:**

- To understand fundamentals of classical mechanics.
- To understand Lagrangian formulation of mechanics and apply it to solve equation of motion.
- To understand Hamiltonian formulation of mechanics and apply it to solve equation of motion.
- To discuss the theory of small oscillations of a system.
- To learn the relativistic formulation of mechanics of a system.

**COURSE OUTCOMES (CO):**

**CO1:** Understand the fundamentals of classical mechanics.

**CO2:** Apply the principles of Lagrangian and Hamiltonian mechanics to solve the equations of motion of physical systems.

**CO3:** Apply the principles of Lagrangian and Hamiltonian mechanics to solve the equations of motion of physical systems.

**CO4:** Analyze the small oscillations in systems and determine their normal modes of oscillations.

**CO5:** Understand and apply the principles of relativistic kinematics to the mechanical systems.

**MAPPING WITH PROGRAM OUTCOMES:**

Map course outcomes (CO) for each course with program outcomes (PO) and program specific outcomes (PSO) in the 3-point scale of STRONG (3), MEDIUM (2) and LOW (1).

	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>
<b>CO1</b>	2	3	3	3	2	2	2	3	2	2
<b>CO2</b>	2	3	3	3	2	2	2	3	2	2
<b>CO3</b>	2	3	3	3	2	2	2	3	2	2
<b>CO4</b>	2	3	3	3	2	2	2	3	2	2
<b>CO5</b>	2	3	3	3	2	2	2	3	2	2

	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>	<b>PSO6</b>	<b>PSO7</b>	<b>PSO8</b>	<b>PSO9</b>	<b>PSO10</b>
<b>CO1</b>	3	3	3	3	3	3	3	2	3	2
<b>CO2</b>	2	3	3	3	3	3	3	2	2	2
<b>CO3</b>	3	3	3	2	2	3	3	2	3	2
<b>CO4</b>	3	3	3	3	2	3	3	2	2	2
<b>CO5</b>	3	2	3	3	2	3	3	2	2	2

**UNIT - I PRINCIPLES OF CLASSICAL MECHANICS (15 Hours)**

Mechanics of a single particle – mechanics of a system of particles – conservation laws for a system of particles – constraints – holonomic & non-holonomic constraints – generalized coordinates – configuration space – transformation equations – principle of virtual work

**UNIT - II LAGRANGIAN FORMULATION (15 Hours)**

D'Alembert's principle – Lagrangian equations of motion for conservative systems – applications: (i) simple pendulum (ii) Atwood's machine (iii) projectile motion.

**UNIT – III HAMILTONIAN FORMULATION (15 Hours)**

Phase space – cyclic coordinates – conjugate momentum – Hamiltonian function – Hamilton's canonical equations of motion – applications: (i) simple pendulum (ii) one dimensional simple harmonic oscillator (iii) motion of particle in a central force field.

**UNIT - IV SMALL OSCILLATIONS (15 Hours)**

Formulation of the problem – transformation to normal coordinates – frequencies of normal modes – linear triatomic molecule.

**UNIT - V RELATIVITY (15 Hours)**

Inertial and non-inertial frames – Lorentz transformation equations – length contraction and time dilation – relativistic addition of velocities – Einstein's mass-energy relation – Minkowski's space – four vectors – position, velocity, momentum, acceleration and force in vector notation and their transformations

**UNIT - VI PROFESSIONAL COMPONENTS (15 Hours)**

Expert Lectures, Online Seminars - Webinars on Industrial Interactions/Visits, Competitive Examinations, Employable and Communication Skill Enhancement, Social Accountability and Patriotism

**TEXT BOOKS:**

1. H. Goldstein, 2002, *Classical Mechanics*, 3rd Edition, Pearson Edu.
2. J. C. Upadhyaya, *Classical Mechanics*, Himalaya Publishing. Co. New Delhi.
3. R. Resnick, 1968, *Introduction to Special Theory of Relativity*, Wiley Eastern, New Delhi.
4. R. G. Takwala and P.S. Puranik, *Introduction to Classical Mechanics* –Tata – McGraw Hill, New Delhi, 1980.
5. N. C. Rana and P.S. Joag, *Classical Mechanics* - Tata McGraw Hill, 2001

**REFERENCE BOOKS:**

1. K. R. Symon, 1971, *Mechanics*, Addison Wesley, London.
2. S. N. Biswas, 1999, *Classical Mechanics*, Books & Allied, Kolkata.
3. Gupta and Kumar, *Classical Mechanics*, KedarNath.
4. T.W.B. Kibble, *Classical Mechanics*, ELBS.
5. Greenwood, *Classical Dynamics*, PHI, New Delhi.

**WEBSOURCES**

1. [http://poincare.matf.bg.ac.rs/~zarkom/Book\\_Mechanics\\_Goldstein\\_Classical\\_Mechanics\\_optimized.pdf](http://poincare.matf.bg.ac.rs/~zarkom/Book_Mechanics_Goldstein_Classical_Mechanics_optimized.pdf)
2. <https://pdfcoffee.com/classical-mechanics-j-c-upadhyay-2014-editionpdf-pdf-free.html>

3. <https://nptel.ac.in/courses/122/106/122106027/>
4. <https://ocw.mit.edu/courses/physics/8-09-classical-mechanics-iii-fall-2014/lecture-notes/>
5. <https://www.britannica.com/science/relativistic-mechanics>

**Question Paper Pattern (as per your board of studies recommendations)**

**THEORY EXAMINATION**

**Continuous Internal Assessment (CIA) (25 marks)**

Two Internal Examinations	15 marks
Assignment / Seminar	10 marks
<b>Total</b>	<b>25 marks</b>

**External Examination (75 marks)**

**Question Pattern – PG**

**Time: 3 Hours**

**Max. Marks: 75**

**Section – A (10 X 2 = 20)**

(Answer ALL the questions)

(Two questions from each Unit)

**Section – B (5 X 5 = 25)**

(Answer all the questions)

(One question from each Unit; either or pattern and any one of the questions will be a problem;  
both part)

**Section C (3 X 10 = 30)**

(Answer any Three Questions out of five)

(One Question from each unit and it may have subdivisions may contain problems also)

<b>I M.Sc. (PH)</b>	<b>LINEAR AND DIGITAL ICs &amp; APPLICATIONS</b>	<b>PPH13B</b>
<b>SEMESTER - I</b>		<b>HRS/WK-5</b>
<b>CORE-III</b>		<b>CREDIT-4</b>

**OBJECTIVES:**

- To introduce the basic building blocks of linear integrated circuits.
- To teach the linear and non-linear applications of operational amplifiers.
- To introduce the theory and applications of PLL.
- To introduce the concepts of waveform generation and introduce one special function ICs.
- Exposure to digital IC's

**COURSE OUTCOMES (CO):**

**CO1:** Learn about the basic concepts for the circuit configuration for the design of linear integrated circuits and develops skill to solve problems

**CO2:** Develop skills to design linear and non-linear applications circuits using Op-Amp and design the active filters circuits.

**CO3:** Gain knowledge about PLL, and develop the skills to design the simple circuits using IC 555 timer and can solve problems related to it.

**CO4:** Learn about various techniques to develop A/D and D/A converters.

**CO5:** Acquire the knowledge about the CMOS logic, combinational and sequential circuits

**MAPPING WITH PROGRAM OUTCOMES:**

Map course outcomes (CO) for each course with program outcomes (PO) and program specific outcomes (PSO) in the 3-point scale of STRONG (3), MEDIUM (2) and LOW (1).

	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>
<b>CO1</b>	3	3	3	3	2	2	3	3	3	2
<b>CO2</b>	3	3	3	3	1	3	3	3	2	1
<b>CO3</b>	3	3	3	3	1	3	3	3	2	1
<b>CO4</b>	3	3	3	3	1	3	3	3	2	1
<b>CO5</b>	3	3	3	2	1	1	2	3	2	1

	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>	<b>PSO6</b>	<b>PSO7</b>	<b>PSO8</b>	<b>PSO9</b>	<b>PSO10</b>
<b>CO1</b>	3	3	3	3	2	2	3	3	3	2
<b>CO2</b>	3	3	3	3	1	3	3	3	2	1
<b>CO3</b>	3	3	3	3	1	3	3	3	2	1
<b>CO4</b>	3	3	3	3	1	3	3	3	2	1
<b>CO5</b>	3	3	3	2	1	1	2	3	2	1

**UNIT – I INTEGRATED CIRCUITS AND OPERATIONAL AMPLIFIER (15 Hours)**

Introduction, Classification of IC's, basic information of Op-Amp 741 and its features, the ideal Operational amplifier, Op-Amp internal circuit and Op-Amp.Characteristics.

**UNIT - II APPLICATIONS OF OP-AMP (15 Hours)**

LINEAR APPLICATIONS OF OP-AMP: Solution to simultaneous equations and differential equations, Instrumentation amplifiers, V to I and I to V converters.

NON-LINEAR APPLICATIONS OF OP-AMP:

Sample and Hold circuit, Log and Antilog amplifier, multiplier and divider, Comparators, Schmitt trigger, Multivibrators, Triangular and Square waveform generators.

**UNIT – III ACTIVE FILTERS & TIMER AND PHASE LOCKED LOOPS (15 Hours)**

ACTIVE FILTERS: Introduction, Butterworth filters – 1st order, 2nd order low pass and high pass filters, band pass, band reject and all pass filters.

TIMER AND PHASE LOCKED LOOPS: Introduction to IC 555 timer, description of functional diagram, monostable and astable operations and applications, Schmitt trigger, PLL - introduction, basic principle, phase detector/comparator, voltage controlled oscillator (IC 566), low pass filter, monolithic PLL and applications of PLL

**UNIT - IV VOLTAGE REGULATOR & D to A AND A to D CONVERTERS (15 Hours)**

VOLTAGE REGULATOR: Introduction, Series Op-Amp regulator, IC Voltage Regulators, IC 723 general purpose regulators, Switching Regulator.

D to A AND A to D CONVERTERS: Introduction, basic DAC techniques -weighted resistor DAC, R-2R ladder DAC, inverted R-2R DAC, A to D converters -parallel comparator type ADC, counter type ADC, successive approximation ADC and dual slope ADC, DAC and ADC Specifications.

**UNIT - V CMOS LOGIC, COMBINATIONAL CIRCUITS USING TTL 74XX ICs & SEQUENTIAL CIRCUITS USING TTL 74XX ICs (15 Hours)**

CMOS LOGIC:CMOS logic levels, MOS transistors, Basic CMOS Inverter, NAND and NOR gates, CMOS AND-OR-INVERT and OR-AND-INVERT gates, implementation of any function using CMOS logic. COMBINATIONAL CIRCUITS USING TTL 74XX ICs: Study of logic gates using 74XX ICs, Four-bit parallel adder (IC 7483), Comparator (IC 7485), Decoder (IC 74138, IC 74154), BCD to 7-segment decoder (IC7447), Encoder (IC74147), Multiplexer (IC74151), Demultiplexer (IC 74154). SEQUENTIAL CIRCUITS USING TTL 74XX ICs: Flip Flops (IC 7474, IC 7473), Shift Registers, Universal Shift Register (IC 74194), 4- bit asynchronous binary counter (IC 7493).

**UNIT - VI PROFESSIONAL COMPONENTS (15 Hours)**

Expert Lectures, Online Seminars - Webinars on Industrial Interactions/Visits, Competitive Examinations, Employable and Communication Skill Enhancement, Social Accountability and Patriotism



**TEXT BOOKS:**

1. D. Roy Choudhury, Shail B. Jain (2012), Linear Integrated Circuit, 4th edition, New Age International Pvt.Ltd.,NewDelhi,India
2. Ramakant A. Gayakwad, (2012), OP-AMP and Linear Integrated Circuits, 4th edition, Prentice Hall / Pearson Education, NewDelhi.
3. B.L. Theraja and A.K. Theraja, 2004, A Textbook of Electrical technology, S. Chand & Co.
4. V.K. Mehta and Rohit Mehta, 2008, Principles of Electronics, S. Chand & Co, 12th Edition.
5. V. Vijayendran, 2008, Introduction to Integrated electronics (Digital & Analog), S.Viswanathan Printers & Publishers Private Ltd, Reprint. V.

**REFERENCE BOOKS:**

1. Sergio Franco (1997), Design with operational amplifiers and analog integrated circuits, McGraw Hill, New Delhi.
2. Gray, Meyer (1995), Analysis and Design of Analog Integrated Circuits, Wiley International, New Delhi.
3. Malvino and Leach (2005), Digital Principles and Applications 5th Edition, Tata McGraw Hill, New Delhi
4. Floyd, Jain (2009), Digital Fundamentals, 8th edition, Pearson Education, New Delhi.
5. Integrated Electronics, Millman &Halkias, Tata McGraw Hill, 17th Reprint (2000)

**WEBSOURCES**

1. [https://nptel.ac.in/course.html/digital circuits/](https://nptel.ac.in/course.html/digital%20circuits/)
2. [https://nptel.ac.in/course.html/electronics/operational amplifier/](https://nptel.ac.in/course.html/electronics/operational%20amplifier/)
3. <https://www.allaboutcircuits.com/textbook/semiconductors/chpt-7/field-effect-controlled-thyristors/>
4. <https://www.electrical4u.com/applications-of-op-amp/>
5. <https://www.geeksforgeeks.org/digital-electronics-logic-design-tutorials/>

**Question Paper Pattern (as per your board of studies recommendations)**

**THEORY EXAMINATION**

**Continuous Internal Assessment (CIA) (25 marks)**

Two Internal Examinations	15 marks
Assignment / Seminar	10 marks
<b>Total</b>	<b>25 marks</b>

**External Examination (75 marks)**

**Question Pattern – PG**

**Time: 3 Hours**

**Max. Marks: 75**

**Section – A (10 X 2 = 20)**

(Answer ALL the questions)

(Two questions from each Unit)

**Section – B (5 X 5 = 25)**

(Answer all the questions)

(One question from each Unit; either or pattern and any one of the questions will be a problem;  
both part)

**Section C (3 X 10 = 30)**

(Answer any Three Questions out of five)

(One Question from each unit and it may have subdivisions may contain problems also)

<b>I M.Sc. (PH)</b>	<b>ANALYSIS OF CRYSTAL STRUCTURES</b>	<b>EPPH14A</b>
<b>SEMESTER - I</b>		<b>HRS/WK-5</b>
<b>ELECTIVE-I</b>		<b>CREDIT-3</b>

**OBJECTIVES:**

- To teach the concept of crystal structures and symmetry, and diffraction theory
- To provide students with a background to X-ray generation, scattering theory and experimental diffraction from single crystals
- To provide instruction on the methods and basis for determining low-molecular weight crystal structures using X-ray Crystallography
- To give the students a background to the instrumentation used for powder diffraction and structure refinement using Rietveld method
- To teach the different levels of structure exhibited by proteins and nucleic acids and methods used in protein crystallography.

**COURSE OUTCOMES (CO):**

**CO1:** Understand crystal symmetry and reciprocal lattice concept for X-ray diffraction

**CO2:** Gain a working knowledge of X-ray generation, X-ray photography with Laue, oscillation and moving film methods, and space group determination

**CO3:** Get an exposure to crystal structure determination using program packages

**CO4:** Understand the instrumentation used for powder diffraction, data collection, data interpretation, and structure refinement using Rietveld method

**CO5:** Get an insight into the structural aspects of proteins and nucleic acids, crystallization of proteins and methods to solve protein structures

**MAPPING WITH PROGRAM OUTCOMES:**

Map course outcomes (CO) for each course with program outcomes (PO) and program specific outcomes (PSO) in the 3-point scale of STRONG (3), MEDIUM (2) and LOW (1).

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
<b>CO1</b>	3	3	3	2	3	2	1	2	2	2
<b>CO2</b>	3	3	3	2	2	2	1	2	2	2
<b>CO3</b>	3	3	2	2	2	2	2	2	2	2
<b>CO4</b>	3	2	2	2	2	2	2	2	2	2
<b>CO5</b>	3	2	2	2	2	2	2	2	2	2

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
<b>CO1</b>	3	3	3	2	3	2	1	2	2	2
<b>CO2</b>	3	3	3	2	2	2	1	2	2	2
<b>CO3</b>	3	3	2	2	2	2	2	2	2	2
<b>CO4</b>	3	2	2	2	2	2	2	2	2	2
<b>CO5</b>	3	2	2	2	2	2	2	2	2	2

**UNIT - I CRYSTAL LATTICE**

**(15 Hours)**

Unit cell and Bravais lattices - crystal planes and directions - basic symmetry elements operations - translational symmetries - point groups - space groups - equivalent positions - Bragg's law - reciprocal lattice concept - Laue conditions - Ewald and limiting spheres - diffraction symmetry - Laue groups.

**UNIT - II DIFFRACTION (15 Hours)**

X-ray generation, properties - sealed tube, rotating anode, synchrotron radiation - absorption - filters and monochromators Atomic scattering factor - Fourier transformation and structure factor - anomalous dispersion - Laue, rotation/oscillation, moving film methods- interpretation of diffraction patterns - cell parameter determination - systematic absences - space group determination.

**UNIT – III STRUCTURE ANALYSIS (15 Hours)**

Single crystal diffractometers - geometries - scan modes - scintillation and area detectors -intensity data collection - data reduction - factors affecting X-ray intensities - temperature and scale factor - electron density - phase problem - normalized structure factor - direct method fundamentals and procedures -Patterson function and heavy atom method - structure refinement - least squares method - Fourier and difference Fourier synthesis - R factor - structure interpretation - geometric calculations - conformational studies - computer program packages.

**UNIT - IV POWDER METHODS (15 Hours)**

Fundamentals of powder diffraction - Debye Scherrer method - diffractometer geometries - use of monochromators and Soller slits - sample preparation and data collection - identification of unknowns - powder diffraction files (ICDD) - Rietveld refinement fundamentals - profile analysis - peak shapes - whole pattern fitting - structure refinement procedures – auto-indexing – structure determination from powder data - new developments. Energy dispersive X-ray analysis – texture studies - crystallite size determination - residual stress analysis - high and low temperature and high pressure crystallography (basics only).

**UNIT - V PROTEIN CRYSTALLOGRAPHY (15 Hours)**

Globular and fibrous proteins, nucleic acids - primary, secondary, tertiary and quaternary structures - helical and sheet structures - Ramachandran map and its significance – crystallization methods for proteins - factors affecting protein crystallization - heavy atom derivatives – methods used to solve protein structures - anomalous dispersion methods.

**UNIT - VI PROFESSIONAL COMPONENTS (15 Hours)**

Expert Lectures, Online Seminars - Webinars on Industrial Interactions/Visits, Competitive Examinations, Employable and Communication Skill Enhancement, Social Accountability and Patriotism.

**TEXT BOOKS:**

1. Azaroff, L.V., "Elements of X-Ray Crystallography", Techbooks1, New York, 1992.
2. Blundell, T.L. and Johnson, L., "Protein Crystallography", Academic Press, New York, 1986.
3. Cullity, B.D. and Stock,S.R. "Elements of X-ray Diffraction", Pearson, 2014.
4. H.L. Bhat, Introduction to Crystal Growth Principles and Practice CRC Press, Taylor & Francis Group, Boca Raton, Florida, 2015.

5. B.R. Pamplin, Crystal Growth, Pergamon Press, Oxford, 1975.

**REFERENCE BOOKS:**

1. Glusker, J.P. and Trueblood, K.N. Crystal Structure Analysis: A Primer", Oxford University, Press, New York, 1994.
2. Ladd, M.F.C. and Palmer, R.A., "Structure Determination by X-ray Crystallography", Plenum Press, New York, 3rd Edition, 1993.
3. Stout, G.H. and Jensen, L. "X-ray Structure Determination, A Practical Guide", Macmillan.,New York, 1989.
4. Woolfson, M.M. "An Introduction to X-ray Crystallography" Cambridge University Press, New York, 1997.
5. Sam Zhang, Lin Ki, Ashok Kumar, Materials Characterization Techniques, CRC Press, Taylor & Francis Group, Boca Raton, Florida, 2009

**WEBSOURCES**

1. <https://archive.nptel.ac.in/courses/112/106/112106227/>
2. <https://archive.nptel.ac.in/courses/104/108/104108098/>
3. <https://www.digimat.in/nptel/courses/video/102107086/L11.html>
4. [https://onlinecourses.nptel.ac.in/noc19\\_cy35/previewhttps://onlinecourses.nptel.ac.in/noc19\\_cy35/preview](https://onlinecourses.nptel.ac.in/noc19_cy35/previewhttps://onlinecourses.nptel.ac.in/noc19_cy35/preview)
5. <https://nptel.ac.in/courses/104/104/104104011/>

**Question Paper Pattern (as per your board of studies recommendations)**

**THEORY EXAMINATION**

**Continuous Internal Assessment (CIA) (25 marks)**

Two Internal Examinations	15 marks
Assignment / Seminar	10 marks
<b>Total</b>	<b>25 marks</b>

**External Examination (75 marks)**

**Question Pattern – PG**

**Time: 3 Hours**

**Max. Marks: 75**

**Section – A (10 X 2 = 20)**

(Answer ALL the questions)

(Two questions from each Unit)

**Section – B (5 X 5 = 25)**

(Answer all the questions)

(One question from each Unit; either or pattern and any one of the questions will be a problem; both part)

**Section C (3 X 10 = 30)**

(Answer any Three Questions out of five)

(One Question from each unit and it may have subdivisions may contain problems also)

<b>I B.Sc. (CH)</b>	<b>GENERAL CHEMISTRY – I</b>	<b>CH101A</b>
<b>SEMESTER – I</b>		<b>HRS/WK – 5</b>
<b>CORE - 1</b>		<b>CREDIT – 4</b>

**OBJECTIVE:**

Various atomic models and atomic structure, Wave particle duality of matter, Periodic table, periodicity in properties and its application in explaining the chemical behavior, Nature of chemical bonding, and Fundamental concepts of organic chemistry.

**COURSE OUTCOMES (COs):**

**CO1:** Explain the atomic structure, wave particle duality of matter, periodic properties bonding, and properties of compounds.

**CO2:** Classify the elements in the periodic table, types of bonds, reaction intermediates electronic effects in organic compounds, types of reagents.

**CO3:** Apply the theories of atomic structure, bonding, to calculate energy of a spectral transition,  $\Delta x$ ,  $\Delta p$  electronegativity, percentage ionic character and bond order.

**CO4:** Evaluate the relationship existing between electronic configuration, bonding, geometry of molecules and reactions; structure reactivity and electronic effects

**CO5:** Construct MO diagrams, predict trends in periodic properties, assess the properties of elements, and explain hybridization in molecules, nature of H – bonding and organic reaction mechanisms.

**Level of Correlation between PO's and CO's**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
<b>CO1</b>	S	S	S	S	S	S	S	M	S	M
<b>CO2</b>	M	S	S	S	M	S	S	M	M	M
<b>CO3</b>	S	S	S	M	S	S	S	M	S	M
<b>CO4</b>	S	S	S	S	S	S	S	M	M	M
<b>CO5</b>	S	M	S	S	S	S	S	M	M	S

**Level of Correlation between PSO's and CO's**

CO /PO	PSO1	PSO2	PSO3	PSO4	PSO5
<b>CO1</b>	3	3	3	3	3
<b>CO2</b>	3	3	3	3	3
<b>CO3</b>	3	3	3	3	3
<b>CO4</b>	3	3	3	3	3
<b>CO5</b>	3	3	3	3	3
<b>Weightage</b>	15	15	15	15	15
<b>Weighted percentage of Course Contribution to Pos</b>	3.0	3.0	3.0	3.0	3.0

**UNIT-I: ATOMIC STRUCTURE AND PERIODIC TRENDS [15 Hrs]**

History of atom (J.J.Thomson, Rutherford); Moseley's Experiment and Atomic number, Atomic Spectra; Black-Body Radiation and Planck's quantum theory - Bohr's model of atom; The Franck-Hertz Experiment; Interpretation of H- spectrum; Photoelectric effect, Compton effect; Dual nature of Matter- De- Broglie wavelength-Davisson and Germer experiment Heisenberg's Uncertainty Principle; Electronic Configuration of Atoms and ions- Hund's rule, Pauli's exclusion principle and Aufbau principle; Numerical problems involving the core concepts.

**UNIT-II: INTRODUCTION TO QUANTUM MECHANICS [15 Hrs]**

Classical mechanics, Wave mechanical model of atom, distinction between a Bohr orbit and orbital; Postulates of quantum mechanics; probability interpretation of wavefunctions, Formulation of Schrodinger wave equation - Probability and electron density-visualizing the orbitals -Probability density and significance of  $\Psi$  and  $\Psi^2$ .

**Modern Periodic Table:**

Cause of periodicity; Features of the periodic table; classification of elements - Periodic trends for atomic size- Atomic radii, Ionic, crystal and Covalent radii; ionization energy, electron affinity, electronegativity-electronegativity scales, applications of electronegativity. Problems involving the core concepts.

**UNIT-III: STRUCTURE AND BONDING – I [15 Hrs]****Ionic bond:**

Lewis dot structure of ionic compounds; properties of ionic compounds; Energy involved in ionic compounds; Born Haber cycle – lattice energies, Madelung constant; relative effect of lattice energy and solvation energy; Ion polarisation– polarising power and polarizability; Fajans' rules - effects of polarisation on properties of compounds; problems involving the core concepts.

**Covalent bond:**

Shapes of orbitals, overlap of orbitals –  $\sigma$  and  $\Pi$  bonds; directed valency - hybridization; VSEPR theory - shapes of molecules of the type  $AB_2$ ,  $AB_3$ ,  $AB_4$ ,  $AB_5$ ,  $AB_6$  and  $AB_7$ . Partial ionic character of covalent bond-dipole moment, application to molecules of the type  $A_2$ ,  $AB$ ,  $AB_2$ ,  $AB_3$ ,  $AB_4$ ; percentage ionic character- numerical problems based on calculation of percentage ionic character.

**UNIT-IV: STRUCTURE AND BONDING – II [15 Hrs]**

VB theory – application to hydrogen molecule; concept of resonance - resonance structures of some inorganic species –  $CO_2$ ,  $NO_2$ ,  $CO_3^{2-}$ ,  $NO_3^-$ ; limitations of VBT; MO theory - bonding, antibonding and nonbonding orbitals, bond order; MO diagrams of  $H_2$ ,  $C_2$ ,  $O_2$ ,  $O_2^+$ ,  $O_2^-$ ,  $O_2^{2-}$ ,  $N_2$ ,  $NO$ ,  $HF$ ,  $CO_2$  magnetic characteristics, comparison of VB and MO theories. Coordinate bond: Definition, Formation of  $BF_3$ ,  $NH_3$ ,  $NH_4^+$ ,  $H_3O^+$  properties. Metallic bond: electron sea model, VB model; Band theory-mechanism of conduction in solids; conductors, insulator, semiconductor – types, applications of semiconductors. Weak Chemical Forces - Vander Waals forces, ion-dipole forces, dipole-dipole interactions, induced dipole interactions, Instantaneous dipole-induced dipole interactions. Repulsive forces; Hydrogen bonding – Types, special properties of water, ice, stability of DNA; Effects of chemical force, melting and boiling points.

**UNIT-V: BASIC CONCEPTS IN ORGANIC CHEMISTRY AND ELECTRONIC EFFECTS [15 Hrs]**

Types of bond cleavage – heterolytic and homolytic; arrow pushing in organic reactions; reagents



and substrates; types of reagents - electrophiles, nucleophiles, free radicals; reaction intermediates – carbanions, carbocations, carbenes, arynes and nitrynes.

Inductive effect - reactivity of alkyl halides, acidity of halo acids, basicity of amines; inductomeric and electromeric effects.

Resonance – resonance energy, conditions for resonance - acidity of phenols, basicity of aromatic amines, stability of carbonium ions, carbanions and free radicals, reactivity of vinyl chloride, dipole moment of vinyl chloride and nitrobenzene, bond lengths; steric inhibition to resonance.

Hyperconjugation - stability of alkenes, bond length, orienting effect of methyl group, dipole moment of aldehydes and nitromethane

Types of organic reactions- addition, substitution, elimination and rearrangements.

**Extended Professional Component (is a part of internal component only, Not to be included in the external examination question paper):**

Questions related to the above topics, from various competitive examinations UPSC/JAM /TNPSC and others to be solved (To be discussed during the Tutorial hours)

**Skills acquired from this course:**

Knowledge, Problem solving, Analytical ability, Professional Competency, Professional Communication and Transferable skills.

**TEXT BOOKS:**

1. Madan, R. D. and Sathya Prakash, *Modern Inorganic Chemistry*, 2<sup>nd</sup>ed.; S.Chand and Company: New Delhi, 2003.
2. Rao, C.N. R. *University General Chemistry*, Macmillan Publication: NewDelhi, 2000.
3. Puri, B. R. and Sharma, L. R. *Principles of Physical Chemistry*, 38<sup>th</sup>ed.; Vishal Publishing Company: Jalandhar, 2002.
4. Bruce, P. Y. and Prasad K. J. R. *Essential Organic Chemistry*, Pearson Education: New Delhi, 2008.
5. Dash UN, Dharmarha OP, Soni P.L. *Textbook of Physical Chemistry*, Sultan Chand & Sons: New Delhi, 2016

**REFERENCE BOOKS:**

1. Maron, S. H. and Prutton C. P. *Principles of Physical Chemistry*, 4<sup>th</sup>ed.; The Macmillan Company: Newyork, 1972.
2. Lee, J. D. *Concise Inorganic Chemistry*, 4<sup>th</sup> ed.; ELBS William Heinemann: London, 1991.
3. Gurudeep Raj, *Advanced Inorganic Chemistry*, 26<sup>th</sup>ed.; Goel Publishing House: Meerut, 2001.
4. Atkins, P.W. & Paula, J. *Physical Chemistry*, 10<sup>th</sup> ed.; Oxford University Press: New York, 2014.
5. Huheey, J. E. *Inorganic Chemistry: Principles of Structure and Reactivity*, 4<sup>th</sup> ed.; Addison, Wesley Publishing Company: India, 1993.

**WEB REFERENCES:**

1. [http://www.mikeblaber.org/oldwine/chm1045/notes\\_m.htm](http://www.mikeblaber.org/oldwine/chm1045/notes_m.htm)
2. [http://www.ias.ac.in/initiat/sci\\_ed/resources/chemistry/Inorganic.html](http://www.ias.ac.in/initiat/sci_ed/resources/chemistry/Inorganic.html)
3. <https://swayam.gov.in/course/64-atomic-structure-and-chemical-bonding>
4. <https://www.chemtube3d.com/>

<b>I B.Sc. (CH)</b>	<b>QUANTITATIVE INORGANIC ESTIMATION AND PREPARATION</b>	<b>CHP101A</b>
<b>SEMESTER – I</b>		<b>HRS/WK – 3</b>
<b>CORE PRACTICAL – 1</b>		<b>CREDIT – 2</b>

**OBJECTIVE:**

Laboratory safety, Handling glasswares, Quantitative estimation, Preparation of inorganic compounds.

**COURSE OUTCOMES (COs):**

**CO1:** Explain the basic principles involved in titrimetric analysis and inorganic preparations.

**CO2:** Compare the methodologies of different titrimetric analysis.

**CO3:** Calculate the concentrations of unknown solutions in different ways and develop the skill to estimate the amount of a substance present in a given solution.

**CO4:** Assess the yield of different inorganic preparations and identify the end point of various titrations.

**Level of Correlation between PO's and CO's**

	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>
<b>CO1</b>	S	S	S	S	S	S	S	M	S	M
<b>CO2</b>	M	S	S	S	M	S	S	M	M	M
<b>CO3</b>	S	S	S	M	S	S	S	M	S	M
<b>CO4</b>	S	S	S	S	S	S	S	M	M	M

**Level of Correlation between PSO's and CO's**

<b>CO /PO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	3	3	3	3	3
<b>CO2</b>	3	3	3	3	3
<b>CO3</b>	3	3	3	3	3
<b>CO4</b>	3	3	3	3	3
<b>Weightage</b>	12	12	12	12	12
<b>Weighted percentage of Course Contribution to Pos</b>	3.0	3.0	3.0	3.0	3.0

## **UNIT-I: CHEMICAL LABORATORY SAFETY IN ACADEMIC INSTITUTIONS.**

Introduction - importance of safety education for students, common laboratory hazards, assessment and minimization of the risk of the hazards, prepare for emergencies from uncontrolled hazards; concept of MSDS; importance and care of PPE; proper use and operation of chemical hoods and ventilation system; fire extinguishers-types and uses of fire extinguishers, demonstration of operation; chemical waste and safe disposal.

### **Common Apparatus Used in Quantitative Estimation (Volumetric)**

Description and use of burette, pipette, standard flask, measuring cylinder, conical flask, beaker, funnel, dropper, clamp, stand, wash bottle, watch glass, wire gauge and tripod stand.

### **Principle of Quantitative Estimation (Volumetric)**

Equivalent weight of an acid, base, salt, reducing agent, oxidizing agent; concept of mole, molality, molarity, normality; primary and secondary standards, preparation of standard solutions; theories of acid-base, redox, complexometric, iodimetric and iodometric titrations; indicators – types, theory of acid–base, redox, metal ion and adsorption indicators, choice of indicators.

## **UNIT-II: QUANTITATIVE ESTIMATION (VOLUMETRIC)**

Preparation of standard solution, dilution from stock solution

### **Permanganometry**

Estimation of sodium oxalate using standard ferrous ammonium sulphate

### **Dichrometry**

Estimation of ferric alum using standard dichromate (external indicator) Estimation of ferric alum using standard dichromate (internal indicator)

### **Iodometry**

Estimation of copper in copper sulphate using standard dichromate

### **Argentimetry**

Estimation of chloride in barium chloride using standard sodium chloride/ Estimation of chloride in sodium chloride (Volhard's method)

## **UNIT-III:**

### **Complexometry**

Estimation of hardness of water using EDTA

### **Estimations**

Estimation of iron in iron tablets Estimation of ascorbic acid.

### **Preparation of Inorganic compounds-**

Potash alum, Tetraammine copper (II) sulphate, Hexamminecobalt (III) chloride, Mohr's Salt.

### **Skills acquired from this course:**

Knowledge, Problem solving, Analytical ability, Professional Competency, Professional Communication and Transferable skills.

### **TEXT BOOKS:**

1. Venkateswaran, V.; Veeraswamy, R.; Kulandivelu, A.R. Basic Principles of Practical Chemistry, 2<sup>nd</sup> ed.; Sultan Chand & Sons: New Delhi, 1997.
2. Nad, A. K.; Mahapatra, B.; Ghoshal, A.; An advanced course in Practical Chemistry, 3<sup>rd</sup> ed.; New Central Book Agency: Kolkata, 2007.

**REFERENCE BOOK:**

1. Mendham, J.; Denney, R. C.; Barnes, J. D.; Thomas, M.; Sivasankar, B.; Vogel's Textbook of Quantitative Chemical Analysis, 6<sup>th</sup> ed.; Pearson Education Ltd: New Delhi, 2000.

**WEB REFERENCES:**

1. <http://www.federica.unina.it/agraria/analytical-chemistry/volumetric-analysis>
2. <https://chemdictionary.org/titration-indicator/>

**SCHEME OF EVALUATION:**

Error up to 1%	:	35 marks
1% - 2%	:	30 marks
2% - 3%	:	25 marks
3% - 4%	:	15 marks
Above 4%	:	05 marks
Preparation	:	10 marks
Viva – voce	:	05 marks
Record	:	10 marks
<b>Total</b>	:	<b>60 marks</b>

<b>I B.Sc. (CH)</b>	<b>ROLE OF CHEMISTRY IN EVERYDAY LIFE</b>	<b>NCH101</b>
<b>SEMESTER – I</b>		<b>HRS/WK – 2</b>
<b>SEC - 1</b>		<b>CREDIT – 2</b>

**OBJECTIVE:**

- Importance of Chemistry in everyday life
- Chemistry of building materials and food
- Chemistry of Drugs and pharmaceuticals

**COURSE OUTCOMES (COs):**

**CO1:** Learn about the chemicals used in everyday life as well as air pollution and water pollution.

**CO2:** Get knowledge on building materials cement, ceramics, glass and plastics, polythene, PVC bakelite, polyesters,

**CO3:** Acquire information about Food and Nutrition. Carbohydrates, Proteins, Fats Also have an awareness about Cosmetics Tooth pastes, face powder, soaps and detergents.

**CO4:** Discuss about the fertilizers like urea, NPK fertilizers and super phosphate. Fuel classification solid, liquid and gaseous; nuclear fuel - examples and uses

**CO5:** Have an idea about the pharmaceutical drugs analgesics and antipyretics like paracetamol and aspirin and also about pigments and dyes and its applications.

**Level of Correlation between PO's and CO's**

	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>
<b>CO1</b>	S	S	S	S	S	S	S	M	S	M
<b>CO2</b>	M	S	S	S	M	S	S	M	M	M
<b>CO3</b>	S	S	S	M	S	S	S	M	S	M
<b>CO4</b>	S	S	S	S	S	S	S	M	M	M
<b>CO5</b>	S	M	S	S	S	S	S	M	M	S

**Level of Correlation between PSO's and CO's**

<b>CO /PO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	3	3	3	3	3
<b>CO2</b>	3	3	3	3	3
<b>CO3</b>	3	3	3	3	3
<b>CO4</b>	3	3	3	3	3
<b>CO5</b>	3	3	3	3	3
<b>Weightage</b>	15	15	15	15	15
<b>Weighted percentage of Course Contribution to Pos</b>	3.0	3.0	3.0	3.0	3.0

**UNIT-I: ENVIRONMENTAL POLLUTION AND MANAGEMENT [6 Hrs]**

General survey of chemicals used in everyday life. Air - components and their importance; photosynthetic reaction, air pollution, green - house effect and the impact on our life style. Water - Sources of water, qualities of potable water, soft and hard water, methods of removal of hardness-water pollution

**UNIT-II: BUILDING MATERIALS AND POLYMERS [6 Hrs]**

Building materials - cement, ceramics, glass and refractories - definition, composition and application only. Plastics - polythene, PVC, bakelite, polyesters, melamine-formaldehyde resins - preparation and uses only.

**UNIT-III: NUTRITION AND COSMETICS [6 Hrs]**

Food and Nutrition - Carbohydrates, Proteins, Fats - definition and their importance as food constituents – balanced diet – Calories minerals and vitamins (sources and their physiological importance). Cosmetics – tooth paste, face powder, soaps and detergents, shampoos, nail polish, perfumes - general formulation and preparations - possible hazards of cosmetic use.

**UNIT-IV: FERTILIZERS AND FUELS [6 Hrs]**

Chemicals in food production – fertilizers - need, natural sources; urea,NPK fertilizers and super phosphate. Fuel – classification - solid, liquid and gaseous; nuclear fuel examples and uses.

**UNIT-V: DRUGS, DYES AND EXPLOSIVES [6 Hrs]**

Pharmaceutical drugs - analgesics and antipyretics - paracetamol and aspirin. Colour chemicals - pigments and dyes - examples and applications. Explosives - classification and examples.

**TEXT BOOKS:**

1. Food chemistry, H. K. Chopra, P. S. Panesar, Narosa publishing house, 2010.
2. A textbook of pharmaceutical chemistry by Jayashree Ghosh, S Chand publishing, 2012.
3. S. Vaithyanathan, Text book of Ancillary Chemistry; Priya Publications, Karur, 2006.
4. B. K, Sharma, Industrial Chemistry; GOEL publishing house, Meerut, sixteenth edition, 2014. Introduction to forensic chemistry, Kelly M. Elkins, CRC Press Taylor & Francis Group, 2019.
5. Jayashree Ghosh, Fundamental Concepts of Applied Chemistry, S. Chand & Co. Publishers, second edition, 2006.

**REFERENCE BOOKS:**

1. Randolph. Norris Shreve, Chemical Process Industries, McGraw-Hill, Texas, fourth edition, 1977.
2. W.A. Poucher, Joseph A. Brink, Jr. Perfumes, Cosmetics and Soaps, Springer, 2000.
3. A.K. De, Environmental Chemistry, New Age International Public Co., 1990.

<b>I B.Sc. (CH)</b>	<b>INTRODUCTORY CHEMISTRY</b>	<b>FCH101</b>
<b>SEMESTER – I</b>		<b>HRS/WK – 2</b>
<b>FC – 1</b>		<b>CREDIT – 2</b>

**OBJECTIVE:**

- Introduction to Organic
- Types of titrations and Concentration terms.
- Lab safety and Nature of chemicals.
- Organic analysis
- Gravimetric Principles

**COURSE OUTCOMES (COs):**

**CO1:** To understand basic organic chemistry.

**CO2:** To understand principle of titrations.

**CO3:** To understand laboratory safety and hygiene.

**CO4:** To understand basics of organic compound analysis.

**CO5:** To understand about gravimetric analysis

**Level of Correlation between PO's and CO's**

	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>
<b>CO1</b>	S	S	S	S	S	S	S	M	S	M
<b>CO2</b>	M	S	S	S	M	S	S	M	M	M
<b>CO3</b>	S	S	S	M	S	S	S	M	S	M
<b>CO4</b>	S	S	S	S	S	S	S	M	M	M
<b>CO5</b>	S	M	S	S	S	S	S	M	M	S

**Level of Correlation between PSO's and CO's**

<b>CO/PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	2	2	2	2	2
<b>CO2</b>	2	2	2	2	2
<b>CO3</b>	2	2	2	2	2
<b>CO4</b>	2	2	2	2	2
<b>CO5</b>	2	2	2	2	2
<b>Weightage</b>	10	10	10	10	10
<b>Weighted percentage of Course Contribution to Pos</b>	2.0	2.0	2.0	2.0	2.0

**UNIT-I: BASIC ORGANIC CHEMISTRY****[6 Hrs]**

Introduction to organic Chemistry – homologous series (alkanes, alkenes, alkynes, alcohols, carboxylic acids) – Alkanes and alkenes – introduction, isomerism and combustion reactions.

**UNIT-II: LAB SAFETY, CHEMICALS AND GLASSWARE****[6 Hrs]**

Laboratory hygiene and safety – first-aid techniques – general work culture inside the chemistry lab.

Nature of chemicals – toxic, corrosive, explosive, inflammable, carcinogenic, other hazardous chemicals – safe storing and handling of chemicals – disposal of chemical wastes. Handling of glass wares- Calibration of pipette, standard measuring flask and burette.

**UNIT-III: TITRIMETRIC METHODS OF ANALYSIS****[6 Hrs]**

Definitions of Molarity and Normality. Primary and secondary standards, Criteria for primary standards-Preparation of standard solutions. Concepts of Acids & Bases - pH of strong and weak acid solutions. Indicators-Theory and their choice. Types of titrations- Acid-base Titrations, Redox Titrations, Precipitation Titrations and Complexometric Titrations-Principles and theory.

**UNIT-IV: BASICS OF ORGANIC ANALYSIS****[6 Hrs]**

Preliminary and solubility tests for identifying organic compounds. Test for Aliphatic / Aromatic – Saturated / Unsaturated compounds. Detection of Nitrogen, Sulphur and halogens. Test for functional groups: phenol, aldehyde, ketone, ester, carbohydrate, amine, amide & carboxylic acid (any one test for each).

**UNIT-V: GRAVIMETRIC METHODS****[6 Hrs]**

Gravimetric analysis - principle, theory and calculation. Steps of a gravimetric analysis: precipitation, digestion, filtration, washing, drying and weighing. Conditions for precipitation - choice of precipitants-advantages and disadvantages of using organic precipitants.

**Extended Professional Component (is a part of internal component only, Not to be included in the external examination question paper):**

Questions related to the above topics, from various competitive examinations UPSC/JAM/TNPSC and others to be solved (To be discussed during the Tutorial hours)

**Skills acquired from this course:**

Knowledge, Problem solving, Analytical ability, Professional Competency, Professional Communication and Transferable skills.

**TEXT BOOKS:**

1. U.N. Dash, 2005, Analytical Chemistry: Theory and Practice, Sultan Chand and sons. Educational Publishers, 2<sup>nd</sup> Edition, New Delhi,
2. J. Bassett, R.C. Denney, G.H. Jerrey and J. Mendham, 1994, Vogel's Text Book of Inorganic Quantitative Analysis, ELBS, 5<sup>th</sup> Edition, London.
3. Gopalan R., Rangarajan K., Subramanian P.S. Elements of Analytical Chemistry, Sultan Chand & Sons, 2003
4. Svehla, 2012, Vogel's Qualitative Analysis, Pearson Education, 7<sup>th</sup> Edition, New Delhi.
5. Venkateswaran V, Veeraswamy R, Kulandaivelu A R, 1997, Basic Principles of Practical Chemistry, Sultan Chand and Sons, 2<sup>nd</sup> Edition, New Delhi.



6. D.A. Skoog, D.M. West and F.J. Holler, 1990, Analytical chemistry, Saunders college publishing, 5th Edition, Philadelphia.
7. Bahl B S, Arul Bhal, (2003), Advanced Organic Chemistry, 3rd ed., S. Chand and Company, New Delhi.

**REFERENCE BOOKS:**

1. Svehla, 2012, Vogel's Qualitative Analysis, Pearson Education, 7th Edition, New Delhi.
2. Venkateswaran V, Veeraswamy R, Kulandaivelu A R, 1997, Basic Principles of Practical Chemistry, Sultan Chand and Sons, 2nd Edition, New Delhi.

**WEB REFERENCES:**

1. [https://www.tees.ac.uk/parttime\\_courses/engineering\\_&\\_construction/certificate\\_of\\_credit\\_foundation\\_process\\_chemistry\\_\(by\\_flexible\\_open\\_learning\).cfm](https://www.tees.ac.uk/parttime_courses/engineering_&_construction/certificate_of_credit_foundation_process_chemistry_(by_flexible_open_learning).cfm)
2. <https://le.ac.uk/courses/chemistry-with-foundation-year-bsc/2023>
3. [https://www.researchgate.net/publication/345381808\\_Foundations\\_for\\_Teaching\\_Chemistry\\_Chemical\\_Knowledge\\_for\\_Teaching](https://www.researchgate.net/publication/345381808_Foundations_for_Teaching_Chemistry_Chemical_Knowledge_for_Teaching)
4. <https://yuli-elearning.com/mod/resource/view.php?id=738>
5. <https://pubs.acs.org/doi/10.1021/acs.jchemed.1c00666>

<b>I B.Sc. (CH)</b>	<b>ANALYTICAL CHEMISTRY - I</b>	<b>CH204A</b>
<b>SEMESTER – II</b>		<b>HRS/WK – 4</b>
<b>CORE THEORY - 3</b>		<b>CREDIT – 3</b>

**OBJECTIVE:**

To understand the basic concepts of electronics, error analysis and to know how to prepare varying concentrations of solution.

**COURSE OUTCOMES (COs):**

**CO 1:** Students will acquire knowledge of error analysis.

**CO 2:** To understand the various concentration units and to know how to prepare solutions of varying concentrations.

**CO 3:** To understand the basics of chemical combinations and equivalent weight determination.

**CO 4:** To get the exposure on separation and purifications of solid and liquid compounds.

**CO 5:** Students will acquire the knowledge on types of chromatographic techniques and applications.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER II	COURSE CODE: CH204A					COURSE TITLE: ANALYTICAL CHEMISTRY- I								HOURS: 4	CREDITS: 3
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)								MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8		
CO1	3	4	4	4	3	3	4	3	3	4	3	4	3	3.54	
CO2	4	3	3	3	3	4	3	2	3	4	3	4	4	3.31	
CO3	3	4	3	3	4	3	2	3	4	3	4	3	3	3.23	
CO4	3	4	3	3	3	3	3	3	3	3	3	4	3	3.23	
CO5	4	3	3	4	3	2	4	2	3	4	3	3	4	3.15	
<b>Mean Overall Score</b>													<b>3.29</b>		

**Result: The Score of this Course is 3.29 (High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **High** association with Programme Outcome and Programme Specific Outcome.

**UNIT-I: THEORY OF ERRORS****[12 Hrs]**

Theory of Errors – the idea of significant figures and its importance with examples – Precision, Accuracy- methods of expressing accuracy – Error analysis – minimizing errors – method of expressing precision – average deviation – Standard deviation – Confidence limit.

**UNIT-II: SOLUTION THEORY****[12 Hrs]**

Definitions of Molality – Normality – Mole fraction and their calculations – Definition and examples for primary and secondary standards – Calculation of equivalent. Theories of acid-base – Redox, complexometric and Iodometric titrations – Problems on Volumetric analysis-strengths of solutions – Theories of indicators – acid, base, redox, metal ion and adsorption indicators and choice of indicators.

**UNIT-III: THEORIES OF CHEMICAL COMBINATIONS****[12 Hrs]**

Chemical formulae and percentage composition – Determination of empirical Formulae – and molecular formulae. Laws of chemical combination: Law of conservation of mass – Law of constant composition – Law of multiple proportions – Law of reciprocal proportions – Gay Lussac's law of Gaseous volumes. Equivalent weights of Compounds – methods of determination of equivalent weights using hydrogen displacement method, oxide method, chloride method, metal displacement method – problems based on the law of normalities for acid, Alkali titrations – the concept of double and back titrations.

**UNIT-IV: SEPARATION AND PURIFICATION TECHNIQUES****[12 Hrs]**

Principles involved in the separation of solids - Purification of solid organic compounds – Crystallisation - Fractional crystallization – Sublimation - Purification of liquids - Experimental techniques of distillation - Fractional distillation - Vacuum distillation - Steam distillation.

**UNIT-V: CHROMATOGRAPHIC TECHNIQUES****[12 Hrs]**

Chromatographic technique – the principle of chromatography – definition of the terms – Rf value – paper chromatography – principle and applications – thin layer chromatography – theory and applications - Column chromatography – principle and applications – ion exchange chromatography – principle, types and applications.

**TEXT BOOKS:**

1. R. Gopalan, P.S. Subramanian, K. Rengarajan, S. Chand and sons (1997) - Elements of Analytical Chemistry.
2. G. R. Chatwal, S. K. Anand - Instrumental Methods of Chemical Analysis – Himalaya Publishing House (2000).

**REFERENCE BOOKS:**

1. D.A. Skoog and D.M. West, Fundamental of Analytical Chemistry, International Edition, 7th Edition (1996), Saunders College Publishing, Philadelphia, Holt, London.
2. R.L. Pecsok, L.D. Shields, T. Cairns and L.C. Mc William, Modern Methods of Chemical Analysis, 2<sup>nd</sup> (1976), John Wiley & Sons, New York.

<b>I B.Sc. (CH)</b>	<b>INORGANIC QUALITATIVE ANALYSIS</b>	<b>CHP202A</b>
<b>SEMESTER – II</b>		<b>HRS/WK – 3</b>
<b>CORE PRACTICAL – 2</b>		<b>CREDIT – 2</b>

### **COURSE OUTCOMES (COs):**

**CO1:** Students acquire the experimental skill of analyzing acid and basic radicals.

**CO2:** Students get to know the preparation of inorganic compounds.

### **SEMI – MICRO QUALITATIVE ANALYSIS**

1. Analysis of simple acid radicals: Carbonate, Nitrate, Sulphate, Chloride.
2. Analysis of interfering acid radicals: Fluoride, Oxalate, Borate, Phosphate.
3. Elimination of interfering acid radicals and identifying the groups of the basic radicals.
4. Analysis of basic radicals (group-wise): Lead, Copper, Bismuth, Cadmium, Aluminium, Iron, Cobalt, Nickel, Manganese, Zinc, Barium, Calcium, Strontium.
5. Analysis of mixtures containing two cations and two anions (of which one is interfering).

### **REFERENCE BOOKS:**

1. Inorganic semi micro qualitative analysis by V.V. Ramanujam. 3<sup>rd</sup> Edition (2004). The National Publishing Company, Chennai.
2. Vogel's qualitative inorganic analysis, 7<sup>th</sup> edition (2012) by G. Svehla and B. Sivasankar. Publisher: Pearson Education Limited.
3. Vogel's Textbook of Quantitative Chemical Analysis, 4<sup>th</sup> Edition (1985), Longman Scientific and Technical, Harlow, 582. by Jeffery, G.H., Bassett, J., Mendham, J. and Denney, R.C.

### **SCHEME OF EVALUATION**

Salt Analysis	:	40 marks
Viva – voce	:	10 marks
Record	:	10 marks
<b>Total</b>	<b>:</b>	<b>60 marks</b>

<b>I B.Sc. (BC)</b>	<b>ALLIED CHEMISTRY – I</b>	<b>ACH101A</b>
<b>SEMESTER – I</b>		<b>HRS/WK – 4</b>
<b>ALLIED - 1</b>		<b>CREDIT – 3</b>

**OBJECTIVE:**

Basics of atomic orbitals, chemical bonds, hybridization and fundamentals of organic chemistry. Nuclear chemistry and industrial chemistry. Importance of speciality drugs and Separation and purification techniques.

**COURSE OUTCOMES (COs):**

**CO1:** State the theories of chemical bonding, nuclear reactions and its applications.

**CO2:** Evaluate the efficiencies and uses of various fuels and fertilizers.

**CO3:** Explain the type of hybridization, electronic effect and mechanism involved in theorganic reactions.

**CO4:** Demonstrate the structure and uses of antibiotics, anaesthetics, antipyretics andartificial sugars.

**CO5:** Analyse various methods to identify an appropriate method for the separation of chemical components.

**Level of Correlation between PSO's and CO's**

<b>CO /PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	3	3	3	3	3
<b>CO2</b>	3	3	3	3	3
<b>CO3</b>	3	3	3	3	3
<b>CO4</b>	3	3	3	3	3
<b>CO5</b>	3	3	3	3	3
<b>Weightage</b>	15	15	15	15	15
<b>Weighted percentage of Course Contribution toPSOs</b>	3.0	3.0	3.0	3.0	3.0

**Level of Correlation between PO's and CO's**

<b>CO /PO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>CO1</b>	3	3	3	3	3
<b>CO2</b>	3	3	3	3	3
<b>CO3</b>	3	3	3	3	3
<b>CO4</b>	3	3	3	3	3
<b>CO5</b>	3	3	3	3	3
<b>Weightage</b>	15	15	15	15	15
<b>Weighted percentage of Course Contribution to Pos</b>	3.0	3.0	3.0	3.0	3.0

**UNIT-I: CHEMICAL BONDING AND NUCLEAR CHEMISTRY [12 Hrs]**

Chemical Bonding: Molecular Orbital Theory-bonding, antibonding and non-bonding orbitals. M.O. diagrams for Hydrogen, Helium, Nitrogen; discussion of bond order and magnetic properties. Nuclear Chemistry: Fundamental particles - Isotopes, Isobars, Isotones and Isomers-Differences between chemical reactions and nuclear reactions- group displacement law. Nuclear binding energy - mass defect - calculations. Nuclear fission and nuclear fusion - differences – Stellar energy. Applications of radioisotopes – carbon dating, rock dating and medicinal applications.

**UNIT-II: INDUSTRIAL CHEMISTRY [12 Hrs]**

Fuels: Fuel gases: Natural gas, water gas, semi water gas, carbureted water gas, producer gas, CNG, LPG and oil gas (manufacturing details not required).

Silicones: Synthesis, properties and uses of silicones.

Fertilizers: Urea, ammonium sulphate, potassium nitrate NPK fertilizer, superphosphate, triple superphosphate.

**UNIT-III: FUNDAMENTAL CONCEPTS IN ORGANIC CHEMISTRY [12 Hrs]**

Hybridization: Orbital overlap hybridization and geometry of CH<sub>4</sub>, C<sub>2</sub>H<sub>4</sub>, C<sub>2</sub>H<sub>2</sub> and C<sub>6</sub>H<sub>6</sub>. Polar effects: Inductive effect and consequences on K<sub>a</sub> and K<sub>b</sub> of organic acids and bases, electromeric, mesomeric, hyper conjugation and steric-examples and explanation.

Reaction mechanisms: Types of reactions- aromaticity-aromatic electrophilic substitution; nitration, halogenation, Friedel-Craft's alkylation and acylation.

Heterocyclic compounds: Preparation, properties of pyrrole and pyridine.

**UNIT-IV: DRUGS AND SPECIALITY CHEMICALS [12 Hrs]**

Definition, structure and uses: Antibiotics viz., Penicillin, Chloramphenicol and Streptomycin; Anaesthetics viz, Chloroform and ether; Antipyretics viz., aspirin, paracetamol and ibuprofen;

Artificial Sweeteners viz., saccharin, Aspartame and cyclamate;

Organic Halogen compounds viz., Freon, Teflon.

**UNIT-V: ANALYTICAL CHEMISTRY [12 Hrs]**

Introduction qualitative and quantitative analysis. Principles of volumetric analysis. Separation and purification techniques: extraction, distillation and crystallization. Chromatography: principle and application of column, paper and thin layer chromatography.

**Extended Professional Component (is a part of internal component only, Not to be included in the external examination question paper):**

Questions related to the above topics, from various competitive examinations UPSC/JAM/TNPSC and others to be solved (To be discussed during the Tutorial hours)

**Skills acquired from this course:**

Knowledge, Problem solving, Analytical ability, Professional Competency, Professional Communication and Transferable skills.

**TEXT BOOKS:**

1. V. Veeraiyan, Textbook of Ancillary Chemistry; High mount publishing house, Chennai, first edition, 2009.
2. S. Vaithyanathan, Text book of Ancillary Chemistry; Priya Publications, Karur, 2006.
3. Arun Bahl, B.S. Bahl, Advanced Organic Chemistry; S. Chand and Company, New Delhi, twenty third edition, 2012.
4. P.L. Soni, H.M. Chawla, Text Book of Inorganic Chemistry; Sultan Chand & sons, New Delhi, twenty ninth edition, 2007.

**REFERENCE BOOKS:**

1. P.L. Soni, Mohan Katyal, Text book of Inorganic chemistry; Sultan Chand and Company, New Delhi, twentieth edition, 2007.
2. B.K, Sharma, Industrial Chemistry; GOEL publishing house, Meerut, sixteenth edition, 2014.
3. Jayashree gosh, Fundamental Concepts of Applied Chemistry; Sultan & Chand, Edition 2006.

<b>I B.Sc. (BC)</b>	<b>ALLIED CHEMISTRY PRACTICAL - I</b>	<b>ACHP101A</b>
<b>SEMESTER – I</b>		<b>HRS/WK – 3</b>
<b>ALLIED PRACTICAL - 1</b>		<b>CREDIT – 2</b>

**OBJECTIVE:**

Basics of preparation of solutions. Principles and practical experience of volumetric analysis.

**COURSE OUTCOMES (COs):**

**CO1:** Gain an understanding of the use of standard flask and volumetric pipettes, burette.

**CO2:** Design, carry out, record and interpret the results of volumetric titration.

**CO3:** Apply their skill in the analysis of water/hardness.

**CO4:** Analyze the chemical constituents in allied chemical products

**Level of Correlation between PSO's and CO's**

<b>CO /PSO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	3	3	3	3	3
<b>CO2</b>	3	3	3	3	3
<b>CO3</b>	3	3	3	3	3
<b>CO4</b>	3	3	3	3	3
<b>Weightage</b>	12	12	12	12	12
<b>Weighted percentage of Course Contribution toPSOs</b>	3.0	3.0	3.0	3.0	3.0

**Level of Correlation between PO's and CO's**

<b>CO /PO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>
<b>CO1</b>	3	3	3	3	3
<b>CO2</b>	3	3	3	3	3
<b>CO3</b>	3	3	3	3	3
<b>CO4</b>	3	3	3	3	3
<b>Weightage</b>	12	12	12	12	12
<b>Weighted percentage of Course Contribution to POs</b>	3.0	3.0	3.0	3.0	3.0



## VOLUMETRIC ANALYSIS

1. Estimation of sodium hydroxide using standard sodium carbonate.
2. Estimation of hydrochloric acid using standard oxalic acid.
3. Estimation of ferrous sulphate using standard Mohr's salt.
4. Estimation of oxalic acid using standard ferrous sulphate.
5. Estimation of potassium permanganate using standard sodium hydroxide.
6. Estimation of magnesium using EDTA.
7. Estimation of ferrous ion using diphenyl amine as indicator.

## REFERENCE BOOK:

1. V. Venkateswaran, R. Veerasamy, A.R. Kulandaivelu, Basic Principles of Practical Chemistry; Sultan Chand & sons, Second edition, 1997.

## SCHEME OF EVALUATION:

Error up to 1%	:	45 marks
1% - 2%	:	40 marks
2 % - 3%	:	30 marks
3% - 4%	:	20 marks
Above 4%	:	05 marks
Viva – voce	:	05 marks
Record	:	10 marks
<b>Total</b>	<b>:</b>	<b>60 marks</b>

<b>I B.Sc. (BC)</b>	<b>ALLIED CHEMISTRY PRACTICAL - II</b>	<b>ACHP202A</b>
<b>SEMESTER – II</b>		<b>HRS/WK – 3</b>
<b>ALLIED PRACTICAL – II</b>		<b>CREDIT – 2</b>

### **QUALITATIVE ANALYSIS OF AN ORGANIC COMPOUND**

1. Systematic analysis of an organic compound containing one functional group and characterization by confirmatory tests.
2. Reactions of Aldehyde (Aliphatic & Aromatic), Carbohydrate, (Reducing & Non-Reducing sugar), Carboxylic Acid (Mono & Di), Phenol (Mono & Dihydric), Primary amine, Amide (Mono & Di).

### **REFERENCE BOOKS:**

1. A.O. Thomas, Practical chemistry- Scientific Book Center.
2. Vogel, Textbook of chemical analysis, Longman.
3. S. Sundaram, & S. Viswanathan, Practical chemistry, 3 Volumes.
4. Vogel, Textbook of Practical Organic chemistry, Longman

### **Scheme of evaluation**

<b>Analysis</b>	<b>:</b>	<b>40 marks</b>
Saturated/ unsaturated	:	5 marks
Special elements	:	9 marks
Aromatic / aliphatic	:	5 marks
Identification of functional group	:	6 marks
Confirmatory tests	:	7 marks
Systematic procedure	:	8 marks
<b>Record</b>	<b>:</b>	<b>10 marks</b>
<b>Viva</b>	<b>:</b>	<b>10 marks</b>
<b>Total</b>	<b>:</b>	<b>60 marks</b>

I M.Sc. (CH)	ORGANIC CHEMISTRY – I	PCH11A
SEMESTER – I		HRS/WK – 6
CORE – 1		CREDIT - 5

**OBJECTIVE:**

To understand the feasibility and the mechanism of various organic reactions. To comprehend the techniques in the determination of reaction mechanisms. To understand the concept of stereochemistry involved in organic compounds. To correlate and appreciate the differences involved in the various types of organic reaction mechanisms. To design feasible synthetic routes for the preparation of organic compounds.

**COURSE OUTCOMES (COs):**

**CO1:** To recall the basic principles of organic chemistry.

**CO2:** To understand the formation and detection of reaction intermediates of organic reactions.

**CO3:** To predict the reaction mechanism of organic reactions and stereochemistry of organic compounds.

**CO4:** To apply the principles of kinetic and non-kinetic methods to determine the mechanism of reactions.

**CO5:** To design and synthesize new organic compounds by correlating the stereochemistry of organic compounds.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER I	COURSE CODE: PCH11A					COURSE TITLE: ORGANIC CHEMISTRY – I								HOURS: 6	CREDITS: 5
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)								MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8		
CO1	4	4	4	4	4	4	3	3	3	4	4	4	4	3.79	
CO2	4	4	4	4	4	4	3	3	3	4	4	4	4	3.79	
CO3	4	3	3	4	3	4	3	3	3	4	4	4	4	3.54	
CO4	3	3	4	4	3	4	3	3	3	4	4	4	4	3.54	
CO5	3	3	4	4	3	4	3	3	3	4	4	4	4	3.54	
Mean Overall Score													3.64		

**Result: The Score of this Course is 3.64 (High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **High** association with Programme Outcome and Programme Specific Outcome.

### **UNIT-I: METHODS OF DETERMINATION OF REACTION MECHANISM [15 Hrs]**

Reaction intermediates, The transition state, Reaction coordinate diagrams, Thermodynamic and kinetic requirements of reactions: Hammond postulate. Methods of determining mechanism: non-kinetic methods - product analysis, determination of intermediates-isolation, detection, and trapping. Cross-over experiments, isotopic labelling, isotope effects and stereochemical evidences. Kinetic methods - relation of rate and mechanism. Effect of structure on reactivity: Hammett and Taft equations. Linear free energy relationship, partial rate factor, substituent and reaction constants.

### **UNIT-II: AROMATIC AND ALIPHATIC ELECTROPHILIC SUBSTITUTION**

**[15 Hrs]**

Aromaticity: Aromaticity in benzenoid, non-benzenoid, heterocyclic compounds and annulenes. Aromatic electrophilic substitution: Orientation and reactivity of di- and polysubstituted phenol, nitrobenzene and halobenzene. Reactions involving nitrogen electrophiles: nitration, nitrosation and diazonium coupling; Sulphur electrophiles: sulphonation; Halogen electrophiles: chlorination and bromination; Carbon electrophiles: Friedel-Crafts alkylation, acylation and arylation reactions. Aliphatic electrophilic substitution Mechanisms:  $SE_2$  and  $SE_i$ ,  $SE_1$ - Mechanism and evidences.

### **UNIT-III: AROMATIC AND ALIPHATIC NUCLEOPHILIC SUBSTITUTION**

**[15 Hrs]**

Aromatic nucleophilic substitution: Mechanisms -  $SN_{Ar}$ ,  $SN_1$  and Benzyne mechanisms - Evidences - Reactivity, Effect of structure, leaving group and attacking nucleophile. Reactions: Oxygen and Sulphur-nucleophiles, Bucherer and Rosenmund reactions, von Richter, Sommelet- Hauser and Smiles rearrangements.  $SN_1$ , ion pair,  $SN_2$  mechanisms and evidences. Aliphatic nucleophilic substitutions at an allylic carbon, aliphatic trigonal carbon and vinyl carbon.  $SN_1$ ,  $SN_2$ ,  $SN_i$ , and  $SE_1$  mechanism and evidences, Swain- Scott, Grunwald-Winstein relationship - Ambident nucleophiles.

### **UNIT-IV: STEREOCHEMISTRY-I**

**[15 Hrs]**

Introduction to molecular symmetry and chirality – axis, plane, center, alternating axis of symmetry. Optical isomerism due to asymmetric and dissymmetric molecules with C, N, S based chiral centers. Optical purity, prochirality, enantiotopic and diastereotopic atoms, groups, faces, axial and planar chirality, chirality due to helical shape, methods of determining the configuration. Racemic modifications: Racemization by thermal, anion, cation, reversible formation, epimerization, mutarotation. D, L system, Cram's and Prelog's rules: R, S-notations, proR, proS, side phase and re phase Cahn-Ingold-Prelog rules, absolute and relative configurations. Configurations of allenes, spiranes, biphenyls, cyclooctene, helicene, binaphthyls, ansa and cyclophanic compounds, exo-cyclic alkylidene-cycloalkanes. Topicity and prostereoisomerism, chiral shift reagents and chiral solvating reagents. Criteria for optical purity: Resolution of racemic modifications, asymmetric transformations, asymmetric synthesis, destruction. Stereoselective and stereospecific synthesis.

### **UNIT-V: STEREOCHEMISTRY-II**

**[15 Hrs]**

Conformation and reactivity of acyclic systems, intramolecular rearrangements, neighbouring group participation, chemical consequence of conformational equilibrium - Curtin-Hammett Principle. Stability of five and six-membered rings: mono-, di- and polysubstituted cyclohexanes, conformation and reactivity in cyclohexane systems. Fused and bridged rings: bicyclic, poly cyclic systems, decalins and Brett's rule. Optical rotation and optical rotatory dispersion, conformational asymmetry, ORD curves, octant rule, configuration and conformation, Cotton effect, axial haloketone rule and determination of configuration.

**TEXT BOOKS:**

1. J. March and M. Smith, Advanced Organic Chemistry, 5<sup>th</sup> edition, John-Wiley and Sons.2001.
2. E. S. Gould, Mechanism and Structure in Organic Chemistry, Holt, Rinehart and Winston Inc., 1959.
3. P.S. Kalsi, Stereochemistry of carbon compounds, 8<sup>th</sup> edition, New Age International Publishers, 2015.
4. P. Y. Bruice, Organic Chemistry, 7<sup>th</sup> Edn, Prentice Hall, 2013.
5. J. Clayden, N. Greeves, S. Warren, Organic Compounds, 2<sup>nd</sup>edition, Oxford University Press, 2014.

**REFERENCE BOOKS:**

1. F.A. Carey and R.J. Sundberg, Advanced Organic Chemistry Part-A and B, 5<sup>th</sup> edition, Kluwer Academic / Plenum Publishers, 2007.
2. D. G. Morris, Stereochemistry, RSC Tutorial Chemistry Text 1, 2001.
3. N.S. Isaacs, Physical Organic Chemistry, ELBS, Longman, UK, 1987.
4. E. L. Eliel, Stereochemistry of Carbon Compounds, Tata-McGraw Hill, 2000.
5. I.L. Finar, Organic chemistry, Vol-1 & 2, 6<sup>th</sup> edition, Pearson Education Asia, 2004.

<b>I M.Sc. (CH)</b>	<b>INORGANIC CHEMISTRY - I</b>	<b>PCH12A</b>
<b>SEMESTER – I</b>		<b>HRS/WK – 6</b>
<b>CORE – 2</b>		<b>CREDIT - 5</b>

**OBJECTIVE:**

To determine the structural properties of main group compounds and clusters. To gain fundamental knowledge on the structural aspects of ionic crystals. To familiarize various diffraction and microscopic techniques. To study the effect of point defects and line defects in ionic crystals. To evaluate the structural aspects of solids.

**COURSE OUTCOMES (COs):**

**CO1:** Predict the geometry of main group compounds and clusters.

**CO2:** Explain about the packing of ions in crystals and apply the radius ratio rule to predict the coordination number of cations.

**CO3:** Understand the various types of ionic crystal systems and analyze their structural features.

**CO4:** Explain the crystal growth methods.

**CO5:** To understand the principles of diffraction techniques and microscopic techniques.

**CO-PO Mapping (Course Articulation Matrix)**

	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>
<b>CO 1</b>	S	S	S	S	M	S	S	S	S	M
<b>CO 2</b>	M	S	S	S	S	M	S	S	S	S
<b>CO 3</b>	S	S	M	S	S	S	S	M	S	S
<b>CO 4</b>	M	S	S	S	S	M	S	S	S	S
<b>CO 5</b>	M	S	M	S	S	M	S	M	S	S

**Strong - 3    Medium-2    Low-1**

**Level of Correlation between PSO's and CO's**

<b>CO /PO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	3	3	3	3	3
<b>CO2</b>	3	3	3	3	3
<b>CO3</b>	3	3	3	3	3
<b>CO4</b>	3	3	3	3	3
<b>CO5</b>	3	3	3	3	3
<b>Weightage</b>	15	15	15	15	15
<b>Weighted percentage of Course Contribution to Pos</b>	3.0	3.0	3.0	3.0	3.0

**3 - Strong, 2 - Medium, 1 - Low**

**UNIT-I: STRUCTURE OF MAIN GROUP COMPOUNDS AND CLUSTERS [15 Hrs]**

VB theory – Effect of lone pair and electronegativity of atoms (Bent's rule) on the geometry of the molecules; Structure of silicates - applications of Paulings rule of electrovalence - isomorphous replacements in silicates – ortho, meta and pyro silicates – one dimensional, two dimensional and three-dimensional silicates. Structure of silicones, Structural and bonding features of B-N, S-N and P-N compounds; Poly acids – types, examples and structures; Borane cluster: Structural features of closo, nido, arachano and klado; carboranes, hetero and metalboranes; Wade's rule to predict the structure of borane cluster; main group clusters – zintl ions and mno rule.

**UNIT-II: SOLID STATE CHEMISTRY – I [15 Hrs]**

Ionic crystals: Packing of ions in simple, hexagonal and cubic close packing, voids in crystal lattice, Radius ratio, Crystal systems and Bravais lattices, Symmetry operations in crystals, glide planes and screw axis; point group and space group; Solid state energetics: Lattice energy – Born-Landé equation - Kapustinski equation, Madelung constant.

**UNIT-III: SOLID STATE CHEMISTRY – II [15 Hrs]**

Structural features of the crystal systems: Rock salt, zinc blende & wurtzite, fluorite and anti-fluorite, rutile and anatase, cadmium iodide and nickel arsenide; Spinels -normal and inverse types and perovskite structures. Crystal Growth methods: From melt and solution (hydrothermal, sol-gel methods) – principles and examples.

**UNIT-IV: TECHNIQUES IN SOLID STATE CHEMISTRY [15 Hrs]**

X-ray diffraction technique: Bragg's law, Powder diffraction method – Principle and Instrumentation; Interpretation of XRD data – JCPDS files, Phase purity, Scherrer formula, lattice constants calculation; Systematic absence of reflections; Electron diffraction technique – principle, instrumentation and application. Electron microscopy – difference between optical and electron microscopy, theory, principle, instrumentation, sampling methods and applications of SEM and TEM.

**UNIT-V: BAND THEORY AND DEFECTS IN SOLIDS [15 Hrs]**

Band theory – features and its application of conductors, insulators and semiconductors, Intrinsic and extrinsic semiconductors; Defects in crystals – point defects (Schottky, Frenkel, metal excess and metal deficient) and their effect on the electrical and optical property, laser and phosphors; Linear defects and its effects due to dislocations.

**TEXT BOOKS:**

1. A R West, Solid state Chemistry and its applications, 2nd Edition (Students Edition), John Wiley & Sons Ltd., 2014.
2. A K Bhagi and G R Chatwal, A textbook of inorganic polymers, Himalaya Publishing House, 2001.
3. L Smart, E Moore, Solid State Chemistry – An Introduction, 4th Edition, CRC Press, 2012.
4. K. F. Purcell and J. C. Kotz, Inorganic Chemistry; W.B. Saunders company: Philadelphia, 1977.
5. J. E. Huheey, E. A. Keiter and R. L. Keiter, Inorganic Chemistry; 4th ed.; Harper and Row: New York, 1983.

**REFERENCE BOOKS:**

1. D. E. Douglas, D.H. McDaniel and J. J. Alexander, Concepts and Models in Inorganic Chemistry, 3rd Ed, 1994.

2. R J D Tilley, Understanding Solids - The Science of Materials, 2<sup>nd</sup> edition, Wiley Publication, 2013.
3. C N R Rao and J Gopalakrishnan, New Directions in Solid State Chemistry, 2<sup>nd</sup> Edition, Cambridge University Press, 199.
4. T. Moeller, Inorganic Chemistry, A Modern Introduction; John Wiley: New York, 1982.
5. D.F. Shriver, P.W. Atkins and C.H. Langford; Inorganic Chemistry; 3rd ed.; Oxford University Press: London, 2001.



<b>I M.Sc. (CH)</b>	<b>ORGANIC CHEMISTRY PRACTICAL – I</b>	<b>PCHP11</b>
<b>SEMESTER – I</b>		<b>HRS/WK – 4</b>
<b>CORE PRACTICAL – 1</b>		<b>CREDIT – 3</b>

**OBJECTIVE:**

- To understand the concept of separation, qualitative analysis and preparation of organic compounds.
- To develop analytical skill in the handling of chemical reagents for separation of binary and ternary organic mixtures.
- To analyze the separated organic components systematically and derivatize them suitably.
- To construct suitable experimental setup for the organic preparations involving two stages.
- To experiment different purification and drying techniques for the compound processing.

**COURSE OUTCOMES (COs):**

**CO1:** To recall the basic principles of organic separation, qualitative analysis and preparation.

**CO2:** To explain the method of separation and analysis of separated organic mixtures and convert them as derivatives by suitable preparation method.

**CO3:** To determine the characteristics of separation of organic compounds by various chemical reactions.

**CO4:** To develop strategies to separate, analyze and prepare organic compounds.

**CO5:** To formulate a method of separation, analysis of organic mixtures and design suitable procedure for organic preparations.

**CO-PO Mapping (Course Articulation Matrix)**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO 1	S	S	S	S	M	S	S	S	S	M
CO 2	M	S	S	S	S	M	S	S	S	S
CO 3	S	S	M	S	S	S	S	M	S	S
CO 4	M	S	S	S	S	M	S	S	S	S
CO 5	M	S	M	S	S	M	S	M	S	S

**Strong - 3    Medium-2    Low-1**

**Level of Correlation between PSO's and CO's**

CO /PO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
<b>Weightage</b>	15	15	15	15	15
<b>Weighted percentage of Course Contribution to Pos</b>	3.0	3.0	3.0	3.0	3.0

**3 - Strong, 2 - Medium, 1 - Low**

## **SEPARATION AND ANALYSIS:**

A. Two component mixtures.

B. Three component mixtures.

### **Extended Professional Component (is a part of internal component only, Not to be included in the external examination question paper):**

Questions related to the above topics, from various competitive examinations UPSC / TRB / NET/ UGC-CSIR / GATE /TNPSC others to be solved (To be discussed during the Tutorial hours)

### **Skills acquired from this course:**

Knowledge, Problem solving, Analytical ability, Professional Competency, Professional Communication and Transferable skills

### **TEXT BOOKS:**

1. A R West, Solid state Chemistry and its applications, 2nd Edition (Students Edition), John Wiley & Sons Ltd., 2014.
2. A K Bhagi and G R Chatwal, A textbook of inorganic polymers, Himalaya Publishing House, 2001.
3. L Smart, E Moore, Solid State Chemistry – An Introduction, 4th Edition, CRC Press, 2012.

### **REFERENCE BOOKS:**

1. D. E. Douglas, D.H. McDaniel and J. J. Alexander, Concepts and Models in Inorganic Chemistry, 3rd Ed, 1994.
2. R J D Tilley, Understanding Solids - The Science of Materials, 2<sup>nd</sup> edition, Wiley Publication, 2013.
3. C N R Rao and J Gopalakrishnan, New Directions in Solid State Chemistry, 2<sup>nd</sup> Edition, Cambridge University Press, 199.

### **WEB REFERENCE:**

1. [https://ocw.mit.edu/courses/3-091-introduction-to-solid-state-chemistry-fall-2018/video\\_galleries/lecture-videos/](https://ocw.mit.edu/courses/3-091-introduction-to-solid-state-chemistry-fall-2018/video_galleries/lecture-videos/)

<b>I M.Sc. (CH)</b>	<b>ORGANIC CHEMISTRY PRACTICAL – II</b>	<b>PCHP12</b>
<b>SEMESTER – I</b>		<b>HRS/WK – 4</b>
<b>CORE PRACTICAL – 2</b>		<b>CREDIT – 3</b>

**OBJECTIVE:**

- To understand the concept of separation, qualitative analysis and preparation of organic compounds.
- To develop analytical skill in the handling of chemical reagents for separation of binary and ternary organic mixtures.
- To analyze the separated organic components systematically and derivatize them suitably.
- To construct suitable experimental setup for the organic preparations involving two stages.
- To experiment different purification and drying techniques for the compound processing.

**COURSE OUTCOMES (COs):**

**CO1:** To recall the basic principles of organic separation, qualitative analysis and preparation.

**CO2:** To explain the method of separation and analysis of separated organic mixtures and convert them as derivatives by suitable preparation method.

**CO3:** To determine the characteristics of separation of organic compounds by various chemical reactions.

**CO4:** To develop strategies to separate, analyze and prepare organic compounds.

**CO5:** To formulate a method of separation, analysis of organic mixtures and design suitable procedure for organic preparations.

**CO-PO Mapping (Course Articulation Matrix)**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO 1	S	S	S	S	M	S	S	S	S	M
CO 2	M	S	S	S	S	M	S	S	S	S
CO 3	S	S	M	S	S	S	S	M	S	S
CO 4	M	S	S	S	S	M	S	S	S	S
CO 5	M	S	M	S	S	M	S	M	S	S

**Strong - 3    Medium-2    Low-1**

**Level of Correlation between PSO's and CO's**

CO /PO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
<b>Weightage</b>	15	15	15	15	15
<b>Weighted percentage of Course Contribution to Pos</b>	3.0	3.0	3.0	3.0	3.0

**3 - Strong, 2 - Medium, 1 - Low**

## UNIT-I: ESTIMATIONS

1. Estimation of Phenol (bromination)
2. Estimation of Aniline (bromination)
3. Estimation of Ethyl methyl ketone (iodimetry)
4. Estimation of Glucose (redox)
5. Estimation of Ascorbic acid (iodimetry)
6. Estimation of Aromatic nitro groups (reduction)
7. Estimation of Glycine (acidimetry)
8. Estimation of Formalin (iodimetry)
9. Estimation of Acetyl group in ester (alkalimetry)
10. Estimation of Hydroxyl group (acetylation)
11. Estimation of Amino group (acetylation)

## UNIT-II: TWO STAGE PREPARATIONS

1. *p*-Bromoacetanilide from aniline
2. *p*-Nitroaniline from acetanilide
3. 1,3,5-Tribromobenzene from aniline
4. Acetyl salicylic acid from methyl salicylate
5. Benzilic acid from benzoin
6. *m*-Nitroaniline from nitrobenzene
7. *m*-Nitrobenzoic acid from methyl benzoate

**Extended Professional Component (is a part of internal component only, Not to be included in the external examination question paper):**

Questions related to the above topics, from various competitive examinations UPSC / TRB / NET/ UGC-CSIR / GATE /TNPSC others to be solved.

### Skills acquired from this course:

Knowledge, Problem solving, Analytical ability, Professional Competency, Professional Communication and Transferable skills

### TEXT BOOKS:

1. A R West, Solid state Chemistry and its applications, 2nd Edition (Students Edition), John Wiley & Sons Ltd., 2014.
2. A K Bhagi and G R Chatwal, A textbook of inorganic polymers, Himalaya Publishing House, 2001.
3. L Smart, E Moore, Solid State Chemistry – An Introduction, 4th Edition, CRC Press, 2012.

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1. D. E. Douglas, D.H. McDaniel and J. J. Alexander, Concepts and Models in Inorganic Chemistry, 3rd Ed, 1994.
2. R J D Tilley, Understanding Solids - The Science of Materials, 2<sup>nd</sup> edition, Wiley Publication, 2013.
3. C N R Rao and J Gopalakrishnan, New Directions in Solid State Chemistry, 2<sup>nd</sup> Edition, Cambridge University Press, 199.

### WEB REFERENCE:

1. [https://ocw.mit.edu/courses/3-091-introduction-to-solid-state-chemistry-fall-2018/video\\_galleries/lecture-videos/](https://ocw.mit.edu/courses/3-091-introduction-to-solid-state-chemistry-fall-2018/video_galleries/lecture-videos/)

<b>I M.Sc. (CH)</b>	<b>NANOMATERIALS AND NANOTECHNOLOGY</b>	<b>EPCH13A</b>
<b>SEMESTER - I</b>		<b>HRS/WK – 5</b>
<b>ELECTIVE – 1</b>		<b>CREDIT- 3</b>

**OBJECTIVE:**

- To understand the concept of nano materials and nano technology.
- To understand the various types of nano materials and their properties.
- To understand the applications of synthetically important nano materials.
- To correlate the characteristics of various nano materials synthesized by new technologies.
- To design synthetic routes for synthetically used new nano materials.

**COURSE OUTCOMES (COs):**

**CO1:** To explain methods of fabricating nanostructures.

**CO2:** To relate the unique properties of nanomaterials to reduce dimensionality of the material.

**CO3:** To describe tools for properties of nanostructures.

**CO4:** To discuss applications of nanomaterials.

**CO5:** To understand the health and safety related to nanomaterial.

**CO-PO Mapping (Course Articulation Matrix)**

	<b>P01</b>	<b>P02</b>	<b>P03</b>	<b>P04</b>	<b>P05</b>	<b>P06</b>	<b>P07</b>	<b>P08</b>	<b>P09</b>	<b>P010</b>
<b>CO 1</b>	S	S	S	S	M	S	S	S	S	M
<b>CO 2</b>	M	S	S	S	S	M	S	S	S	S
<b>CO 3</b>	S	S	M	S	S	S	S	M	S	S
<b>CO 4</b>	M	S	S	S	S	M	S	S	S	S
<b>CO 5</b>	M	S	M	S	S	M	S	M	S	S

**Strong - 3    Medium-2    Low-1**

**Level of Correlation between PSO's and CO's**

<b>CO /PO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	3	3	3	3	3
<b>CO2</b>	3	3	3	3	3
<b>CO3</b>	3	3	3	3	3
<b>CO4</b>	3	3	3	3	3
<b>CO5</b>	3	3	3	3	3
<b>Weightage</b>	15	15	15	15	15
<b>Weighted percentage of Course Contribution to Pos</b>	3.0	3.0	3.0	3.0	3.0

**3 - Strong, 2 - Medium, 1 - Low**

## **UNIT-I: INTRODUCTION OF NANOMATERIALS AND NANOTECHNOLOGIES**

**[15 Hrs]**

Introduction - role of size, classification - 0D, 1D, 2D, 3D. Synthesis-Bottom-Up, Top-Down, consolidation of nano powders. Features of nanostructures, Background of nanostructures. Techniques of synthesis of nanomaterials, Tools of the nanoscience. Applications of nanomaterials and technologies.

## **UNIT-II: BONDING IN NANOMATERIALS AND SYNTHESIS METHODS OF NANOMATERIALS**

**[15 Hrs]**

Bonding and structure of the nanomaterials, Predicting the Type of Bonding in a Substance crystal structure. Metallic nanoparticles, Surfaces of Materials, Nanoparticle Size and Properties. Synthesis- Physical and chemical methods - inert gas condensation, arc discharge, laser ablation, sol-gel, solvothermal and hydrothermal-CVD-types, metallo organic, plasma enhanced, and low-pressure CVD. Microwave assisted and electrochemical synthesis.

## **UNIT-III: PROPERTIES OF NANOMATERIALS**

**[15 Hrs]**

Mechanical properties of materials, theories relevant to mechanical properties. Techniques to study mechanical properties of nanomaterials, adhesion and friction, thermal properties of nanomaterials Nanoparticles: gold and silver, metal oxides: silica, iron oxide and alumina - synthesis and properties.

## **UNIT-IV: ELECTRICAL PROPERTIES AND APPLICATIONS OF NANOMATERIALS**

**[15 Hrs]**

Electrical properties, Conductivity and Resistivity, Classification of Materials based on Conductivity, magnetic properties, electronic properties of materials. Classification of magnetic phenomena. Semiconductor materials – classification-Ge, Si, GaAs, SiC, GaN, GaP, CdS, PbS. Identification of materials as p and n –type semiconductor-Hall effect - quantum and anomalous, Hall voltage - interpretation of charge carrier density. Applications of semiconductors: p-n junction as transistors and rectifiers, photovoltaic and photogalvanic cell.

## **UNIT-V: NANOCOMPOSITES AND CHARACTERIZATION TECHNIQUES OF NANOMATERIALS**

**[15 Hrs]**

Nano thin films, nanocomposites. Application of nanoparticles in different fields. Core-shell nanoparticles - types, synthesis, and properties. Nanocomposites - metal-, ceramic- and polymer-matrix composites-applications. Characterization – SEM, TEM and AFM - principle, instrumentation and applications.

### **Extended Professional Component (is a part of internal component only, Not to be included in the external examination question paper):**

Questions related to the above topics, from various competitive examinations UPSC / TRB / NET/ UGC-CSIR / GATE /TNPSC others to be solved (To be discussed during the Tutorial hours)

### **Skills acquired from this course:**

Knowledge, Problem solving, Analytical ability, Professional Competency, Professional Communication and Transferable skills.

### **TEXT BOOKS:**

1. S. Mohan and V. Arjunan, Principles of Materials Science, MJP Publishers, 2016.
2. Arumugam, Materials Science, Anuradha Publications, 2007.
3. Giacavazzo et. al., Fundamentals of Crystallography, International Union of Crystallography. Oxford Science Publications, 2010.
4. Woolfson, An Introduction to Crystallography, Cambridge University Press, 2012.

5. James F. Shackelford and Madanapalli K. Muralidhara, Introduction to Materials Science for Engineers. 6<sup>th</sup> ed., PEARSON Press, 2007.

**REFERENCE BOOKS:**

1. S. Mohan and V. Arjunan, Principles of Materials Science, MJP Publishers, 2016.
2. Arumugam, Materials Science, Anuradha Publications, 2007.
3. Giacavazzo et. al., Fundamentals of Crystallography, International Union of Crystallography. Oxford Science Publications, 2010.
4. Woolfson, An Introduction to Crystallography, Cambridge University Press, 2012.
5. James F. Shackelford and Madanapalli K. Muralidhara, Introduction to Materials Science for Engineers. 6<sup>th</sup> ed., PEARSON Press, 2007.

**WEB REFERENCES:**

1. <http://xrayweb.chem.ou.edu/notes/symmetry.html>.
2. <http://www.uptti.ac.in/classroom-content/data/unit%20cell.pdf>.

<b>I M.Sc. (CH)</b>	<b>ELECTROCHEMISTRY</b>	<b>EPCH14A</b>
<b>SEMESTER - I</b>		<b>HRS/WK – 5</b>
<b>ELECTIVE – 2</b>		<b>CREDIT- 3</b>

**OBJECTIVE:**

- To understand the behavior of electrolytes in terms of conductance, ionic atmosphere, interactions.
- To familiarize the structure of the electrical double layer of different models.
- To compare electrodes between current density and over potential.
- To discuss the mechanism of electrochemical reactions.
- To highlight the different types of over voltages and its applications in electroanalytical techniques.

**COURSE OUTCOMES (COs):**

**CO1:** To understand the behaviour of electrolytes in solution and compare the structures of electrical double layer of different models.

**CO2:** To predict the kinetics of electrode reactions applying Butler-Volmer and Tafel equations

**CO3:** To study different thermodynamic mechanism of corrosion,

**CO4:** To discuss the theories of electrolytes, electrical double layer, electrostatics and activity coefficient of electrolytes

**CO5:** To have knowledge on storage devices and electrochemical reaction mechanism.

**CO-PO Mapping (Course Articulation Matrix)**

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010
CO 1	S	S	S	S	M	S	S	S	S	M
CO 2	M	S	S	S	S	M	S	S	S	S
CO 3	S	S	M	S	S	S	S	M	S	S
CO 4	M	S	S	S	S	M	S	S	S	S
CO 5	M	S	M	S	S	M	S	M	S	S

**Strong - 3    Medium-2    Low-1**

**Level of Correlation between PSO's and CO's**

CO /PO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
<b>Weightage</b>	15	15	15	15	15
<b>Weighted percentage of Course Contribution to Pos</b>	3.0	3.0	3.0	3.0	3.0

**3 - Strong, 2 - Medium, 1 - Low**



**UNIT-I: IONICS****[15 Hrs]**

Arrhenius theory -limitations, van't Hoff factor and its relation to colligative properties. Deviation from ideal behavior. Ionic activity, mean ionic activity and mean ionic activity coefficient-concept of ionic strength, Debye Huckel theory of strong electrolytes, activity coefficient of strong electrolytes Determination of activity coefficient ion solvent and ion-ion interactions. Born equation. Debye-Huckel Bjerrum model. Derivation of Debye-Huckel limiting law at appreciable concentration of electrolytes modifications and applications. Electrolytic conduction-Debye-Huckel Onsager treatment of strong electrolyte-qualitative and quantitative verification and limitations. Evidence for ionic atmosphere. Ion association and triple ion formations.

**UNIT-II: ELECTRODE-ELECTROLYTE INTERFACE****[15 Hrs]**

Interfacial phenomena -Evidences for electrical double layer, polarizable and non-polarizable interfaces, Electrocapillary phenomena - Lippmann equation electro capillary curves. Electrokinetic phenomena electro-osmosis, electrophoresis, streaming and sedimentation potentials, colloidal and poly electrolytes. Structure of double layer: Helmholtz -Perrin, Guoy- Chapman and Stern models of electrical double layer. Zeta potential and potential at zero charge. Applications and limitations.

**UNIT-III: ELECTRODICS OF ELEMENTARY ELECTRODE REACTIONS****[15 Hrs]**

Behavior of electrodes: Standard electrodes and electrodes at equilibrium. Anodic and Cathodic currents, condition for the discharge of ions. Nernst equation, polarizable and non-polarizable electrodes. Model of three electrode system, over potential. Rate of electro chemical reactions: Rates of simple elementary reactions. Butler-Volmer equation-significance of exchange current density, net current density and symmetry factor. Low and high field approximations. symmetry factor and transfer coefficient Tafel equations and Tafel plots.

**UNIT-IV: ELECTRODICS OF MULTISTEP MULTI ELECTRON SYSTEM [15 Hrs]**

Rates of multi-step electrode reactions, Butler - Volmer equation for a multi-step reaction. Rate determining step, electrode polarization and depolarization. Transfer coefficients, its significance and determination, Stoichiometric number. Electro-chemical reaction mechanisms-rate expressions, order, and surface coverage. Reduction of  $I_3^-$ ,  $Fe^{2+}$ , and dissolution of Fe to  $Fe^{2+}$ . Overvoltage - Chemical and electro chemical, Phase, activation and concentration over potentials. Evolution of oxygen and hydrogen at different pH. Pourbiax and Evan's diagrams.

**UNIT-V: CONCENTRATION POLARIZATION, BATTERIES AND FUEL CELLS****[15 Hrs]**

Modes of Transport of electro active species - Diffusion, migration and hydrodynamic modes. Role of supporting electrolytes. Polarography-principle and applications. Principle of square wave polarography. Cyclic voltammetry- anodic and cathodic stripping voltammetry and differential pulse voltammetry. Sodium and lithium-ion batteries and redox flow batteries. Mechanism of charge storage: conversion and alloying. Capacitors- mechanism of energy storage, charging at constant current and constant voltage. Energy production systems: Fuel Cells: classification, alkaline fuel cells, phosphoric acid fuel cells, high temperature fuel cells

**Extended Professional Component (is a part of internal component only, Not to be included in the external examination question paper):**

Questions related to the above topics, from various competitive examinations UPSC / TRB / NET/ UGC-CSIR / GATE /TNPSC others to be solved (To be discussed during the Tutorial hours)

**Skills acquired from this course:**

Knowledge, Problem solving, Analytical ability, Professional Competency, Professional Communication and Transferable skills.

**TEXT BOOKS:**

1. D.R. Crow, Principles and applications of electrochemistry, 4th edition, Chapman & Hall/CRC, 2014.
2. J. Rajaram and J.C. Kuriakose, Kinetics and Mechanism of chemical transformations Macmillan India Ltd., New Delhi, 2011.
3. S. Glasstone, Electro chemistry, Affiliated East-West Press, Pvt., Ltd., New Delhi, 2008.
4. B. Viswanathan, S. Sundaram, R. Venkataraman, K. Rengarajan and P.S. Raghavan, Electrochemistry-Principles and applications, S. Viswanathan Printers, Chennai, 2007.
5. Joseph Wang, Analytical Electrochemistry, 2<sup>nd</sup> edition, Wiley, 2004.

**REFERENCE BOOKS:**

1. J.O.M. Bockris and A.K.N. Reddy, Modern Electro chemistry, vol.1 and 2B, Springer, Plenum Press, New York, 2008.
2. J.O.M. Bockris, A.K.N. Reddy and M.G. Aldeco Morden Electro chemistry, vol. 2A, Springer, Plenum Press, New York, 2008.
3. Philip H. Rieger, Electrochemistry, 2<sup>nd</sup> edition, Springer, New York, 2010.
4. L.I. Antropov, Theoretical electrochemistry, Mir Publishers, 1977.
5. K.L. Kapoor, A Text book of Physical chemistry, volume-3, Macmillan, 2001.

**WEB REFERENCE:**

1. <https://www.pdfdrive.com/modern-electrochemistry-e34333229>.

I M.Sc. (CH)	ORGANIC CHEMISTRY - II	PCH21A
SEMESTER - II		HRS/WK – 5
CORE THEORY - 3		CREDIT- 5

### OBJECTIVES:

To learn the aspects of substitution reactions and its applications. To appreciate the principles of addition and elimination reactions.

### COURSE OUTCOMES (COs):

**CO1:** To understand the path, feasibility and mechanism of a reaction.

**CO2:** To understand the techniques involved in the determination of mechanism of reactions and to propose methods to determine the mechanism of reaction.

**CO3:** To understand the concept of stereochemistry and reaction mechanism.

**CO4:** To learn various reactions and rearrangements involving reactive intermediates like carbocations, carbanions, free radicals, carbenes and nitrenes.

**CO5:** To learn the applications of oxidation and reduction reactions in organic synthesis.

### Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes

SEMESTER II	COURSE CODE: PCH21A					COURSE TITLE: ORGANIC CHEMISTRY - II								HOURS: 5	CREDITS: 5
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)								MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8		
CO1	4	4	3	4	3	4	4	4	4	4	4	4	3	3.76	
CO2	4	3	3	3	3	3	3	3	4	3	3	4	4	3.30	
CO3	3	3	4	3	3	3	3	4	4	4	4	4	4	3.53	
CO4	4	3	3	3	3	3	3	4	4	3	4	4	4	3.46	
CO5	3	3	3	4	3	3	3	3	3	4	4	4	4	3.38	
Mean Overall Score														3.48	

**Result: The Score of this Course is 3.48 (High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **High** association with Programme Outcome and Programme Specific Outcome.

**UNIT-I: REACTIVE INTERMEDIATES****[15 Hrs]**

Structure, reactivity, formation, stability and reactions involving free radicals, benzyne, carbenes and nitrenes. Long and short lived free radicals. Addition of free radicals to olefinic double bonds. Aromatic radical substitutions: Decomposition of diazocompounds, phenol – coupling, Sandmeyer reaction, Gomberg reaction, Pschorr reaction, Ulmann reaction, Hunsdiecker reaction. Acids and Bases, HSAB Principle.

**UNIT-II: ADDITION REACTIONS****[15 Hrs]**

Electrophilic, nucleophilic and free radical mechanisms of addition to carbon – carbon multiple bonds – isolated and conjugated multiple bonds. Hydration, hydroxylation, hydroboration. Stereochemical aspects to be studied wherever applicable. Nucleophilic addition reactions of carbonyl compounds: Aldol, Perkin, Stobbe, Claisen, Dieckmann, Benzoin condensation. Mannich, Reformatsky, Grignard, Robinson Annulation and Shapiro reactions.

**UNIT-III: ELIMINATION REACTIONS****[15 Hrs]**

Elimination reactions: E1, E2 and E1cB mechanism along with spectrum. Hofmann and Saytzeff rules, Bredt's rule. Dehydration, dehydrohalogenation and dehalogenation. Stereochemistry of E2 elimination in cyclohexane systems. Mechanism of pyrolytic eliminations. Chugaev and Cope eliminations.

**UNIT-IV: OXIDATION****[15 Hrs]**

Mechanism – study of the following oxidation reactions – oxidation of alcohols with Cr(VI) and Mn reagents – oxidation of methylene to carbonyl, oxidation of aryl methanes – Etard reaction – Formation of C=C bonds - Wittig reaction, Formation of C–C bonds by dehydrogenation, dehydrogenation by Quinones, Hg(OAc)<sub>2</sub> and Pb(OAc)<sub>4</sub>. Formation of C–C bond by phenol coupling and acetylene coupling – allylic oxidation - SeO<sub>2</sub>, oxidation of alcohol, glycols, halides and amines to aldehydes and ketones, oxidation of olefinic double bonds and unsaturated carbonyl compounds – oxidative cleavage of C–C bond.

**UNIT-V: REDUCTION****[15 Hrs]**

Synthetic importance of Clemmensen and Wolff-Kishner reductions – modification of Wolff-Kishner reduction – Birch reduction, MPV reduction. Catalytic hydrogenation and Sommelet reaction. Reduction with LiAlH<sub>4</sub>, NaBH<sub>4</sub>, tert-butylaluminum hydride, Sodium cyanoborohydride and trialkyl tin hydride.

**TEXT BOOKS:**

1. J. March and M. Smith, Advanced Organic Chemistry, 5th ed., John-Wiley and Sons, 2001.
2. P. Y. Bruice, Organic Chemistry, 7<sup>th</sup> edn., Prentice Hall, 2013.
3. F. A. Carey and R. J. Sundberg, Advanced organic chemistry, Plenum publishers Ltd., 2000.
4. Clayden, Greeves, Warren, Wothers, Organic chemistry, Oxford University Press.

**REFERENCE BOOKS:**

1. R.O.C. Norman, J.M. Coxon, Principles of organic synthesis, ELBS publications, 1994.
2. Seyhan Ege, Organic Chemistry, AITBS, 2001.
3. Michael Smith, Organic synthesis, McGraw Hill, 1996.
4. W. Carruthers, J. Coldham, Modern methods of Organic synthesis, IV edition, Academic press, 1989.
5. Reinhard Brukner, Advanced Organic Chemistry, Academic press, Elsevier, 2002.

<b>I M.Sc. (CH)</b>	<b>INORGANIC CHEMISTRY PRACTICAL - I</b>	<b>PCHP21</b>
<b>SEMESTER – II</b>		<b>HRS/WK – 5</b>
<b>CORE PRACTICAL – 3</b>		<b>CREDIT – 3</b>

### **COURSE OUTCOMES (COs):**

**CO1:** To improve the skill in quantitative estimation of metal ions by complexometric titration.

**CO2:** To identify the metal ions qualitatively in a mixture of metal ions.

**CO3:** To improve the skill in the synthesis of inorganic complexes.

1. Semi micro qualitative analysis of mixture containing two common and two rare cations. The following are the cations to be included- W, Se, Te, Mo, Ce, Th, Ti, Zr, V, U, Li.
2. Complexometric titrations (EDTA method) – Estimation of Ca, Mg and Zn.
3. Preparation of the following
  - 1) Potassium tris(oxalato)aluminate(III)hydrate
  - 2) Sodium bis(thiosulphato)cuprate(II)
  - 3) Tris(thiourea)copper(I) sulphate
  - 4) Diisothiocyanatodipyridine manganese(II)
  - 5) Tetramminecopper(II) sulphate

### **Continuous internal assessment (CIA) (40 marks)**

Based on the periodical evaluation of record and experiments assessed by the staff in charge.

### **External examination (60 marks)**

#### **6 Hrs. Exam**

**Total Marks: 60**

- |  |          |
|--|----------|
| 1. a) Qualitative analysis (semi micro) (Mixture of 4 radicals anions)<br>(2 rare +2 common cations) | 20 Marks |
| 2. (a) Preparation   | 10 Marks |
| (b) EDTA (complexometric titration)  | 20 Marks |
| 3. (a) Practical Record Note Book  | 5 Marks  |
| (b) Practical Viva-Voce  | 5 Marks  |

#### **REFERENCE BOOKS:**

1. Inorganic semi micro qualitative analysis by V.V. Ramanujam. 3<sup>rd</sup> Edition (2004). The National Publishing Company, Chennai.
2. Vogel's qualitative inorganic analysis, 7<sup>th</sup> edition (2012) by G. Svehla and B. Sivasankar. Publisher: Pearson Education Limited.

<b>I M.Sc. (CH)</b>	<b>INORGANIC CHEMISTRY PRACTICALS – II</b>	<b>PCHP22</b>
<b>SEMESTER – II</b>		<b>HRS/WK – 5</b>
<b>CORE PRACTICAL - 4</b>		<b>CREDIT - 3</b>

### **COURSE OUTCOMES (COs):**

**CO1:** To improve the skill in quantitative estimation of metal ions by colorimetry.

**CO2:** To identify the methodology to estimate a metal ion in the presence of another metal ion.

**CO3:** To improve the skill in the synthesis of inorganic compounds

1. Spectral interpretation of some inorganic compounds
2. Colourimetric estimation of metal ions (Fe, Cu, Ni)
3. Estimation of metal ions by Gravimetric and Volumetric analysis (Cu, Ni, Zn, Fe)

### **EVALUATION PATTERN**

#### **Continuous internal assessment (CIA) (40 marks)**

Based on the periodical evaluation of record and experiments assessed by the staff in charge

#### **External Examination (60 marks)**

**Duration: 6 Hrs**

**Total Marks: 60**

- |  |            |
|--|------------|
| 1. Estimation of metal ions by Volumetric & Gravimetric method | - 30 marks |
| 2. Estimation of metal ions by photo colorimetric method       | - 10 marks |
| 3. Spectral interpretation                                     | - 5 marks  |
| 4. Viva voce   | - 5 marks  |
| 5. Record  | - 10 marks |

#### **REFERENCE BOOKS:**

1. Inorganic semi micro qualitative analysis by V.V. Ramanujam. 3<sup>rd</sup> Edition (2004). The National Publishing Company, Chennai.
2. Vogel's qualitative inorganic analysis, 7<sup>th</sup> edition (2012) by G. Svehla and B. Sivasankar. Publisher: Pearson Education Limited.
3. Vogel's Textbook of Quantitative Chemical Analysis, 5th Edition, Longman Scientific and Technical, Harlow, 582. by Jeffery, G.H., Bassett, J., Mendham, J. and Denney, R.C.

<b>I M.Sc Biochemistry</b>	<b>BASICS OF BIOCHEMISTRY</b>	<b>COURSE CODE:</b> <b>PBC11B</b>
<b>SEMESTER-I</b>		<b>HRS/WK-5</b>
<b>CORE-1</b>		<b>CREDIT-4</b>

**OBJECTIVES:**

1. Students will be introduced to the structure of biomolecules.
2. The significance of carbohydrates in biological processes will be understood.
3. The structure, properties and biological significance of lipids in the biological system will be studied
4. Students will learn about the concepts of protein structure and their significance in biological processes and creatively comprehend the role of membrane components with their biological significance.
5. Students will gain knowledge about the structures and functional roles of nucleic acids in the biological system

**COURSE OUTCOMES (CO's):**

**CO1:** Explain the chemical structure and functions of carbohydrates

**CO2:** Using the knowledge of lipid structure and function, explain how it plays a role in Signaling pathways

**CO3:** Describe the various levels of structural organization of proteins and the role of proteins in biological system

**CO4:** Apply the knowledge of proteins in cell-cell interactions

**CO5:** Applying the knowledge of nucleic acid sequencing in research and diagnosis.

<b>SEMESTER I</b>	<b>COURSE CODE : PBC11B</b>					<b>COURSE TITLE : Basics of Biochemistry</b>								<b>HOURS:4</b> <b>CREDITS:3</b>
<b>COURSE OUTCOMES</b>	<b>PROGRAMME OUTCOMES(POS)</b>					<b>PROGRAMME SPECIFIC OUTCOMES(PSOS)</b>								<b>MEAN SCORE OF CO'S</b>
	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PS O1</b>	<b>PS O2</b>	<b>PS O3</b>	<b>PS O4</b>	<b>PS O5</b>	<b>PS O6</b>	<b>PS O7</b>	<b>PS O8</b>	
<b>CO1</b>	5	4	3	4	4	4	4	3	4	4	5	4	5	<b>4.05</b>
<b>CO2</b>	4	5	3	4	5	4	4	3	4	4	4	5	3	<b>3.92</b>
<b>CO3</b>	4	4	5	4	5	5	4	3	4	4	3	3	4	<b>4.00</b>
<b>CO4</b>	3	4	4	5	4	5	3	3	3	5	5	3	3	<b>3.84</b>
<b>CO5</b>	4	3	3	4	4	5	5	4	5	4	4	4	4	<b>4.1</b>
<b>Mean Overall Score</b>													<b>3.9</b>	

**Result: The Score of this Course is 3.9 (High)**

<b>Association</b>	<b>1%-20%</b>	<b>21%-40%</b>	<b>41%-60%</b>	<b>61%-80%</b>	<b>81%-100%</b>
<b>Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Interval</b>	<b>0&lt;=rating&lt;=1</b>	<b>1.1&lt;=rating&lt;=2</b>	<b>2.1&lt;=rating&lt;=3</b>	<b>3.1&lt;=rating&lt;=4</b>	<b>4.1&lt;=rating&lt;=5</b>
<b>Rating</b>	<b>Very Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>High</b>	<b>Very High</b>

This Course is having **High** association with Programme Outcome and Programme Specific Outcome

**UNIT I:** Carbohydrates- Classification, structure (configurations and conformations, anomeric forms), function and properties of monosaccharides, mutarotation, Disaccharides and oligosaccharides with suitable examples . Polysaccharides - Homopolysaccharides (starch, glycogen, cellulose, inulin, dextrin, agar, pectin, dextran). Heteropolysaccharides - Glycosaminoglycans– source, structure, functions of hyaluronic acid, chondroitin sulphates, heparin, keratan sulphate,. Glycoproteins - proteoglycans. O- Linked and N-linked glycoproteins. Biological significance of glycan. Blood group polysaccharides. Bacterial cell wall (peptidoglycans, teichoic acid) and plant cell wall carbohydrates. **(12 Hrs)**

**UNITII:** Lipids – Classification of lipids, structure, properties and functions of fatty acids, triacylglycerols, phospholipids, glycolipids, sphingolipids and steroids – Biological importance. Eicosanoids- classification, structure and functions of prostaglandins, thromboxanes, leukotrienes. Lipoproteins – Classification ,structure, transport ( endogenous and exogenous Pathway ) and their biological significance. **(12 Hrs)**

**UNITIII:** Overview of Amino acids - classification, structure and properties of amino acids, Biological role.Non Protein aminoacids and their biological significance .Proteins – classification based on composition, structure and functions. Primary, secondary, super secondary (motifs) (Helix-turn –helix, helix-loop-helix, Beta-alpha-beta motif, Rosemann Rossmann fold , Greek key ),tertiary and quaternary structure of proteins. Structural characteristics of collagen and hemoglobin. Determination of amino acid sequence.Chemical synthesis of a peptide, Forces involved in stabilization of protein structure. Ramachandran plot. Folding of proteins. Molecular chaperons – Hsp 70 and Hsp 90 - biological role. **(12 Hrs)**

**UNITIV:** Membrane Proteins - Types and their significance. Cytoskeleton proteins - actin , tubulin , intermediate filaments . Biological role of cytoskeletal proteins. Membrane structure- fluid mosaic model. **(12 Hrs)**

**UNITV:** Nucleic acids – types and forms (A, B, C and Z) of DNA. Watson-Crick model- Primary, secondary and tertiary structures of DNA. Triple helix and quadruplex DNA. Mitochondrial and chloroplast DNA. DNA supercoiling (calculation of Writhe, linking and twist number). Determination of nucleic acid sequences by Maxam Gilbert and Sanger’s methods. Forces stabilizing nucleic acid structure. Properties of DNA and RNA. C-value, C-value paradox, Cot curve. Structure and role of nucleotides in cellular communications. Major and minor classes of RNA, their structure and biological functions. **(12 Hrs)**



## **TEXT BOOKS**

1. David L. Nelson and Michael M. Cox (2012) *Lehninger Principles of Biochemistry* (6th ed) W. H. Freeman.
2. Voet D. & Voet J. G. (2010) *Biochemistry*, (4th ed), John Wiley & Sons, Inc.
3. Metzler D. E. (2003). *The chemical reactions of living cells* (2nd ed), Academic Press.
4. Zubay G. L. (1999) *Biochemistry*, (4th ed), McGraw-Hill.
5. Lubert Stryer (2010) *Biochemistry*, (7th ed), W. H. Freeman
6. Satyanarayan, U. (2014) *Biochemistry* (4th ed), Arunabha Sen Books & Allied (P) Ltd, Kolkata.

## **Reference books**

### **Web resources**

1. [https://bio.libretexts.org/Bookshelves/Biochemistry/Book%3A\\_Biochemistry\\_Online\\_\(Jakubowski\)](https://bio.libretexts.org/Bookshelves/Biochemistry/Book%3A_Biochemistry_Online_(Jakubowski))
2. <https://www.thermofisher.com/in/en/home/life-science/protein-biology/protein-biology-learning-center/protein-biology-resource-library/pierce-protein-methods/protein-glycosylation.html>
3. <https://ocw.mit.edu/courses/biology/7-88j-protein-folding-and-human-disease-spring-2015/study-materials/>
4. <https://www.open.edu/openlearn/science-maths-technology/science/biology/nucleic-acids-and-chromatin/content-section-3.4.2>
5. <https://www.genome.gov/genetics-glossary/Cell-Membrane>
6. <https://nptel.ac.in/content/storage2/courses/102103012/pdf/mod3.pdf>

<b>I M.Sc Biochemistry</b>	<b>BIOCHEMICAL AND MOLECULAR BIOLOGY TECHNIQUES</b>	<b>COURSE CODE:</b>
<b>SEMESTER-I</b>		<b>PBC12B</b>
<b>CORE-2</b>		<b>HRS/WK-5</b>
		<b>CREDIT-4</b>

### OBJECTIVES

Biochemical techniques combine various inter-disciplinary methods in biological research and the course aims to provide students with the following objectives:

1. To understand the various techniques used in biochemical investigation and microscopy.
2. To explain chromatographic techniques and their applications
3. To explain electrophoretic techniques.
4. To comprehend the spectroscopic techniques and demonstrate their applications in biochemical investigations.
5. To acquire knowledge of radio labelling techniques and centrifugation.

### COURSE OUTCOMES (CO's):

**CO1.** Attain good knowledge in modern used in biochemical investigation and microscopy and apply the experimental protocols to plan and carry out simple investigations in biological research.

**CO2.** Demonstrate knowledge to implement the theoretical basis of chromatography in upcoming practical course work.

**CO3.** Demonstrate knowledge to implement the theoretical basis of electrophoretic techniques in research work.

**CO4.** Tackle more advanced and specialized spectroscopic techniques that are pertinent to research.

**CO5.** Tackle more advanced and specialized radioisotope and centrifugation techniques that are pertinent to research work.

SEMESTER I	COURSE CODE : PBC12B					COURSE TITLE :Biochemical and Molecular Biology Techniques								HOURS:4 CREDITS:3
	PROGRAMME OUTCOMES(POS)					PROGRAMME SPECIFIC OUTCOMES(PSOS)								MEAN SCORE OF CO'S
COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PS O1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	
CO1	5	4	3	5	4	4	4	3	4	4	5	4	5	4.15
CO2	4	5	3	4	5	4	4	3	4	4	4	5	3	3.92
CO3	4	4	5	4	5	5	4	4	4	4	3	3	4	4.07
CO4	3	4	4	5	4	5	3	3	3	5	5	3	3	3.84
CO5	4	3	3	4	4	5	5	4	5	4	4	5	4	4.15
	Mean Overall Score													4

**Result: The Score of this Course is 4.0 (High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **High** association with Programme Outcome and Programme Specific Outcome

**UNIT I:** General approaches to biochemical investigation, cell culture techniques and microscopic techniques. Organ and tissue slice technique, cell distribution and homogenization techniques, cell sorting, and cell counting, tissue Culture techniques. Cryopreservation, Biosensors- principle and applications. Principle, working and applications of light microscope, dark field, phase contrast and fluorescent microscope. Electron microscope- Principle, instrumentation of TEM and SEM, Specimen preparation and applications-shadow casting, negative staining and freeze fracturing. **(12 Hrs)**

**UNIT II:** Basic principles of chromatography- adsorption and partition techniques. Chiral Chromatography and counter current Chromatography. Adsorption Chromatography – Hydroxy apatite chromatography and hydrophobic interaction Chromatography. Affinity chromatography. Gas liquid chromatography- principle, instrumentation, column development, detectors and applications. Low pressure column chromatography – principle, instrumentation, column packing, detection, quantitation and column efficiency, High pressure liquid chromatography- principle, instrumentation, delivery pump, sample injection unit, column packing, development, detection and application. Reverse HPLC, capillary electro chromatography and perfusion chromatography. **(12 Hrs)**

**UNIT III:** General principles of electrophoresis, supporting medium, factors affecting electrophoresis, Isoelectric focusing-principle, ampholyte, development of pH gradient and application. PAGE-gel casting-horizontal, vertical, slab gels, sample application, detection-staining using CBB, silver, fluorescent stains. SDS PAGE-principle and application in molecular weight determination principle of disc gel electrophoresis ,2D PAGE. Electrophoresis of nucleic acids-agarose gel electrophoresis of DNA, pulsed field gel electrophoresis- principle, apparatus, application. Electrophoresis of RNA, curve. Microchip electrophoresis and 2D electrophoresis, Capillary electrophoresis.**(12 Hrs)**

**UNIT IV:** Basic laws of light absorption- principle, instrumentation and applications of UV-Visible, IR, ESR, NMR, Mass spectroscopy, Turbidimetry and Nephelometry. Luminometry (Luciferase system, chemiluminescence). X - ray diffraction. Atomic absorption spectroscopy - principle and applications - Determination of trace elements. **(12 Hrs)**

**UNIT V:** Nature of radioactivity-detection and measurement of radioactivity, methods based upon ionisation (GM counter) and excitation (scintillation counter), autoradiography and

applications of radioactive isotopes, Biological hazards of radiation and safety measures in handling radioactive isotopes. Basic principles of Centrifugation. Preparative ultracentrifugation - Differential centrifugation, Density gradient centrifugation. Analytical ultracentrifugation - Molecular weight determination. (12 Hrs)

### **TEXT BOOKS**

1. Keith Wilson , John Walker (2010) Principles and Techniques of Biochemistry and Molecular Biology (7th ed) Cambridge University Press

2. David Sheehan (2009), Physical Biochemistry: Principles and Applications (2nd ed), Wiley-Blackwell

3. David M. Freifelder (1982) Physical Biochemistry: Applications to Biochemistry and Molecular Biology, W.H. Freeman

4. Rodney F. Boyer (2012), Biochemistry Laboratory: Modern Theory and techniques, (2nd ed), Prentice Hall

5. Kaloch Rajan (2011), Analytical techniques in Biochemistry and Molecular Biology, Springer

6. Segel I.H (1976) Biochemical Calculations (2nd ed), John Wiley and Sons

7. Robyt JF (2015) Biochemical techniques: Theory and Practice (1st ed), CBS Publishers & Distributors

### **Reference books**

Web resources

1. Principles and techniques of biochemistry and molecular biology:

2. [https://www.kau.edu.sa/Files/0017514/Subjects/principals%20and%20techniques%20of%20biochemistry%20and%20molecular%20biology%207th%20ed%](https://www.kau.edu.sa/Files/0017514/Subjects/principals%20and%20techniques%20of%20biochemistry%20and%20molecular%20biology%207th%20ed%20)

<b>I M.Sc Biochemistry</b>	<b>PHYSIOLOGY AND CELL BIOLOGY</b>	<b>COURSE CODE:</b>
<b>SEMESTER-I</b>		<b>PBC13B</b>
<b>CORE-3</b>		<b>HRS/WK-5</b>
		<b>CREDIT-4</b>

## OBJECTIVE

To understand the functions and activities of organs, tissues or cells and of physical and chemical phenomena involved in the human body

## COURSE OUTCOMES (CO's):

**CO1.** Specifically understand the biological and chemical processes within a human cell

**CO2.** Identify and prevent diseases

**CO3.** Understand defects in digestion, nutritional deficiencies and intolerances, and gastrointestinal pathologies

**CO4.** Identify general characteristics in individuals with imbalances of acid- base, fluid and electrolytes.

**CO5.** Process the mechanism: the transmission of biochemical information between cell membrane and nucleus.

<b>SEMESTER I</b>	<b>COURSE CODE : PBC13B</b>					<b>COURSE TITLE:PHYSIOLOGY AND CELL BIOLOGY</b>								<b>HOURS:4 CREDITS :3</b>
<b>COURSE OUTCOMES</b>	<b>PROGRAMME OUTCOMES(POS)</b>					<b>PROGRAMME SPECIFIC OUTCOMES(PSOS)</b>								<b>MEAN SCORE OF CO'S</b>
	<b>PO 1</b>	<b>PO2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>	<b>PSO6</b>	<b>PSO7</b>	<b>PS O8</b>	
<b>CO1</b>	3	5	2	2	2	4	4	4	3	2	4	4	4	3.3
<b>CO2</b>	3	4	2	3	2	5	4	5	5	3	3	4	3	3.2
<b>CO3</b>	4	3	3	2	3	4	4	4	3	3	4	3	4	3.2
<b>CO4</b>	5	4	2	2	2	3	5	5	3	2	3	4	4	3.4
<b>CO5</b>	4	5	2	3	3	5	5	5	5	2	4	4	4	3.4
<b>Mean overall score</b>													<b>3.3</b>	

**Result: The Score of this Course is 3.3 (High)**

<b>Association</b>	<b>1%-20%</b>	<b>21%-40%</b>	<b>41%-60%</b>	<b>61%-80%</b>	<b>81%-100%</b>
<b>Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Interval</b>	<b>0&lt;=rating&lt;=1</b>	<b>1.1&lt;=rating&lt;=2</b>	<b>2.1&lt;=rating&lt;=3</b>	<b>3.1&lt;=rating&lt;=4</b>	<b>4.1&lt;=rating&lt;=5</b>
<b>Rating</b>	<b>Very Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>High</b>	<b>Very High</b>

This Course is having **High** association with Programme Outcome and Programme Specific Outcome

**UNIT I:** Major classes of cell junctions- anchoring, tight and gap junctions. Major families of cell adhesion molecules (CAMs)- cadherins, integrins. Types of tissues. Epithelium- organisation and types. The basement membrane. Cell cycle- mitosis and meiosis, Cell cycle-phases and regulation. Cell death mechanisms- an overview-apoptosis, necrosis. **(12 Hrs)**

**UNIT II:** Digestive system- structure and functions of different components of digestive system, digestion and absorption of carbohydrates, lipids and proteins, role of bile salts in digestion and absorption, mechanism of HCl formation in stomach, role of various enzymes and hormones involved in digestive system. Composition of blood, lymph and CSF. Blood cells - WBC, RBC and energy metabolism of RBC, Blood clotting mechanism and blood groups- ABO and Rhesus system. **(12 Hrs)**

**UNIT III:** Respiratory system-Gaseous transport and acid-base homeostasis. Mechanism of the movement of O<sub>2</sub> and CO<sub>2</sub> through lungs, arterial and venous circulation. Bohr effect, oxygen and carbon dioxide binding haemoglobin. pH maintenance by cellular and intracellular proteins. Phosphate and bicarbonate buffers, Metabolic acidosis and alkalosis. Respiratory acidosis and alkalosis. Regulation of fluid and electrolyte balance. **(12 Hrs)**

**UNIT IV:** Sensory transduction, Nerve impulse transmission- nerve cells, synapses, reflex arc structure, resting membrane potential, Nernst equation, action potential, voltage gated ion-channels, impulse transmission, neurotransmission, neurotransmitter receptors, synaptosomes, synaptotagmin, rod and cone cells in the retina, changes in the visual cycle, photochemical reaction and regulation of rhodopsin, odour receptors, learning and memory. Chemistry of muscle contraction – actin and myosin filaments, theories involved in muscle contraction, mechanism of muscle contraction, energy sources for muscle contraction. **12 Hrs**

**UNIT V** Hormones – Classification, Biosynthesis, circulation in blood, modification and degradation. Mechanism of hormone action, Target cell concept. Hormones of Hypothalamus, pituitary, Pancreatic, thyroid & parathyroid, adrenal and gonadal hormones. Synthesis, secretion, physiological actions and feedback regulation of synthesis. **(12 Hrs)**

### **TEXT BOOKS**

1. Karp, G. (2010). Cell and Molecular Biology: Concepts and Experiments (6th ed). John Wiley & Sons. Inc.
2. Bruce Alberts and Dennis Bray (2013), Essential Cell Biology, (4<sup>th</sup> ed), Garland Science.
3. De Robertis, E.D.P. and De Robertis, E.M.F. (2010). Cell and Molecular Biology. (8<sup>th</sup> ed). Lippincott Williams and Wilkins, Philadelphia.

4. Cooper, G.M. and Hausman, R.E. (2009). The Cell: A Molecular Approach. (5<sup>th</sup> ed). Sunderland, Mass. Sinauer Associates, Inc.
5. Wayne M. Baker (2008) the World of the Cell. (7<sup>th</sup> ed). Pearson Benjamin Cummings Publishing, San Francisco. Cell Biology
6. John E. Hall (2010). Guyton and Hall Textbook of Medical Physiology (12<sup>th</sup> ed), Saunders
7. Harrison's Endocrinology by J. Larry Jameson Series: Harrison's Specialty, 19th Edition  
Publisher: McGraw-Hill, Year: 2016.

## **REFERENCE BOOKS**

### **Web resources**

- 1.<https://www.genome.gov/genetics-glossary/Cell-Cycle>
- 2.<https://my.clevelandclinic.org/health/diseases/16083-infertility-causes>
- 3.<https://www.webmd.com/heartburn-gerd/reflux-disease>
- 4.<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5760509/>
- 5.<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3249628/>

<b>I M.Sc Biochemistry</b>	<b>MICROBIOLOGY &amp; IMMUNOLOGY</b>	<b>COURSE CODE:</b> <b>EPBC14B</b>
<b>SEMESTER-I</b>		<b>HRS/WK-5</b>
<b>ELECTIVE PAPER I</b>		<b>CREDIT-3</b>

### OBJECTIVES

1. To understand the classification of microorganisms based on their structure, size and shape with an insight into the ancient scriptures about microbes.
2. Able to explain the role of microorganisms in environment and also to learn the culture conditions.
3. To recognize the possible contamination of foods by microorganisms, to learn about counteracting preservative measures and to know about probiotic nature of microorganisms.
4. To gain knowledge on pathogenic mediation by microorganisms and preventive measures as well.
5. To comprehend the features of antimicrobial agents, their mechanism of action along with the side effects and also to explore natural remedial measures against microbes.

### COURSE OUTCOMES (CO's):

**CO1.** To classify (by both ancient and modern modes) the different types of microorganisms and explain life cycle of the microbes

**CO2.** To recognize the microorganisms involved in decay of foods and will be able to apply various counteracting measures. The students also will be able to relate the role of certain beneficial microbes in day-to-day's food consumption.

**CO3.** To understand the common pathogenic bacterial and fungi that cause toxic effects and also will be able to employ curative measures.

**CO4.** To analyse various features of wide variety of antimicrobial agents along with their mode of action, in addition, being able to apprehend the valuable potentials of traditional and easily available herbs.

**CO5.** To apply knowledge gained in production of industrially important products as both pharmaceutical and nutraceutical.

SEMESTER I	COURSE CODE :EPBC14B					COURSE TITLE:MICROBIOLOGY & IMMUNOLOGY								HOURS:4 CREDITS :3
COURSE OUTCOMES	PROGRAMME OUTCOMES(POS)					PROGRAMME SPECIFIC OUTCOMES(PSOS)								MEAN SCORE OF CO'S
	PO 1	PO2	PO 3	PO 4	PO 5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	
CO1	3	5	2	2	2	4	4	4	3	2	4	4	4	3.3
CO2	3	4	2	3	2	5	4	5	5	3	3	4	3	3.2
CO3	4	3	3	2	3	4	4	4	3	3	4	3	4	3.2
CO4	5	4	2	2	2	3	5	5	3	2	3	4	4	3.4
CO5	4	5	2	3	3	5	5	5	5	2	4	4	4	3.4
Mean overall score													3.3	

**Result: The Score of this Course is 3.3 (High)**



Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **High** association with Programme Outcome and Programme Specific Outcome

**UNIT I:** Taxonomical classification - bacteria, viruses (DNA, RNA), algae, fungi and protozoa. Distribution and role of microorganisms in soil, water and air. Charaka's classification of microbes, lytic cycle and lysogeny. Types of culture media, isolation of pure culture, growth curve and the measurement of microbial growth. (12 Hrs)

**UNIT II:** Contamination and spoilage of foods – cereals, cereal products, fruits, vegetables, meat, fish, poultry, eggs, milk and milk products. General principles of traditional and modern methods of food preservation - Removal or inactivation of microorganisms, boiling, steaming, curing, pasteurization, cold processing, freeze drying, irradiation, vacuum packing, control of oxygen and enzymes. Microbes involved in preparation of fermented foods - cheese, yoghurt, curd, pickles, rice pan cake, appam, ragi porridge (கேழ்வரகுக் கூழ்) and bread. (12 Hrs)

**UNIT III:** Food poisoning- bacterial food poisoning, *Salmonella*, *Clostridium botulinum*(botulism), *Staphylococcus aureus*, fungal food poisoning – aflatoxin, food infection – *Clostridium*, *Staphylococcus* and *Salmonella*. Pathogenic microorganisms, *E. coli*, *Pseudomonas*, *Klebsilla*, *Streptococcus*, *Haemophilus*, & *Mycobacterium*, causes, control, prevention, cure and safety. Food microbiological screening- Real time PCR, ELISA, Aerobic and anaerobic Plate Count, dye reduction method, anaerobic lactic acid bacteria, anaerobic sporeformers, Hazard analysis critical control point(HACCP) (12 Hrs)

**UNIT IV:** Antimicrobial chemotherapy, General characteristics of antimicrobial agents. Mechanism of action – sulfonamides, sulphones and PAS. Penicillin, streptomycin- spectra of activity, mode of administration, mode of action, adverse effects and sensitivity test., Antiviral and antiretroviral agents, Antiviral RNA interference, natural intervention (Natural immune modulators routinely used in Indian medical philosophy). (12 Hrs)

**UNIT V:** Immune system- definition and properties. Cells of the immune system – neutrophils, eosinophils, basophils, mast cells, monocytes, macrophages, dendritic cells, natural killer cells, and lymphocytes (B cells and T cells). Lymphoid organs- Primary and Secondary; structure and functions. Antigen and Complement System: definition, properties- antigenicity and immunogenicity, antigenic determinants and haptens. Antigen - antibody interactions - molecular

mechanism of binding. Affinity, avidity, valency, cross reactivity and multivalent binding. Immunoglobulins & Immune Response: Structure, classes and distribution of antibodies. Antibody diversity. Immune system in health & disease, Transplantation immunology- graft rejection and HLA antigens. Immunological techniques, Flow cytometry and its application.

(12 Hrs)

### **TEXT BOOKS**

1. Michael J. Pelczar Jr. (2001) Microbiology (5th ed), McGraw Hill Education (India) Private Limited
2. Frazier WC, Westhoff DC, Vanitha NM (2010) Food Microbiology (5<sup>th</sup> ed), McGraw Hill Education (India) Private Limited
3. Willey J and Sherwood L (2011) , Prescott's Microbiology (8<sup>th</sup> ed) McGraw Hill Education (India)
4. Ananthanarayanan, Paniker and Arti Kapil (2013) Textbook of Microbiology (9<sup>th</sup> ed) Orient Black Swan
5. Judy Owen, Jenni Punt Kuby (2013) , Immunology (Kindt, Kuby Immunology) (7th ed) W. H. Freeman & Co
6. Brooks GF and Carroll KC (2013) Jawetz Melnick & Adelbergs Medical Microbiology, (26<sup>th</sup> ed) McGraw Hill Education
7. Greenwood D (2012) , Medical Microbiology, Elsevier Health

### **Reference books**

#### **Web resources**

1. <https://www.ijam.co.in/index.php/ijam/article/view/1326> (Krumi (Microorganisms) in Ayurveda- a critical review)
2. Virtual Lectures in Microbiology and Immunology, University of Rochester
3. <https://www.frontiersin.org/articles/10.3389/fphar.2020.578970/full#h9>
4. <https://www.frontiersin.org/articles/10.3389/fmicb.2018.02151/full>
5. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7559905/>

<b>I M.Sc Biochemistry</b>	<b>ENERGY AND DRUG METABOLISM</b>	<b>COURSE CODE:</b> <b>EPBC15</b>
<b>SEMESTER-I</b>		<b>HRS/WK-5</b>
<b>ELECTIVE PAPER II</b>		<b>CREDIT-3</b>

### OBJECTIVES

- 1.Familiarize on concepts of enthalpy, entropy, free energy, redox system, biological oxidation and high energy compounds
- 2.Provide an insight into the relationship between electron flow and phosphorylation
- 3.Inculcate knowledge on processes involved in converting light energy to chemical energy and associated food production by autotrophs
- 4.Provide a platform to understand the versatile role of Krebs cycle, transport of NADH across mitochondrial membrane and energetics
- 5.Educate on the various phases xenobiotic metabolism

### COURSE OUTCOMES (CO's):

**CO1.** Appreciate the relationship between free energy and redox potential and will be able to justify the role of biological oxidation and energy rich compounds in maintaining the energy level of the system

**CO2.** Gain knowledge on role of mitochondria in the production of energy currency of the cell

**CO3.** Acquaint with the process of photosynthesis

**CO4.** Comprehend on the diverse role of TCA cycle and the energy obtained on complete oxidation of glucose and fatty acid

**CO5.** Correlate the avenues available to metabolize the bimolecules

SEMESTER I	COURSE CODE :EPBC15					COURSE TITLE:ENERGY & DRUG METABOLISM								HOURS:5 CREDITS :3
COURSE OUTCOMES	PROGRAMME OUTCOMES(POS)					PROGRAMME SPECIFIC OUTCOMES(PSOS)								MEAN SCORE OF CO'S
	PO 1	PO2	PO 3	PO 4	PO 5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	
CO1	3	5	2	2	2	4	4	4	3	2	4	4	4	3.3
CO2	3	4	2	3	2	5	4	5	5	3	3	4	3	3.2
CO3	4	3	3	2	3	4	4	4	3	3	4	3	4	3.2
CO4	5	4	2	2	2	3	5	5	3	2	3	4	4	3.4
CO5	4	5	2	3	3	5	5	5	5	2	4	4	4	3.4
<b>Mean overall score</b>													<b>3.3</b>	

**Result: The Score of this Course is 3.3 (High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **High** association with Programme Outcome and Programme Specific Outcome

**UNIT I:** Thermodynamic- principles in biology- Concept of entropy, enthalpy and free energy change. Redox systems. Redox potential and calculation of free energy. Biological oxidation – Oxidases, dehydrogenases, hydroperoxidases, oxygenases. Energy rich compounds – phosphorylated and non-phosphorylated. High energy linkages.(12 Hrs)

**UNIT II:** Electron transport chain-various complexes of ETC, Q-cycle. Inhibitors of ETC. Oxidative phosphorylation-P/O ratio, chemiosmotic theory. Mechanism of ATP synthesis - role of F<sub>0</sub>-F<sub>1</sub> ATPase, ATP-ADP cycle. Inhibitors of oxidative phosphorylation ionophores, protonophores .Regulation of oxidative phosphorylation(12 Hrs)

**UNIT III:** Light reaction-Hills reaction, absorption of light, photochemical event. Photo ETC-cyclic and non-cyclic electron flow. Photophosphorylation-role of CF<sub>0</sub>-CF<sub>1</sub> ATPase. Dark reaction- Calvin cycle, control of C<sub>3</sub> pathway, and Hatch-Slack pathway (C<sub>4</sub> pathway), Photorespiration. Synthesis and degradation of starch (12 Hrs)

**UNIT IV:** Interconversion of major food stuffs. Energy sources of brain, muscle, liver, kidney and adipose tissue. Amphibolic nature of Citric acid cycle. Anaplerotic reaction. Krebs cycle, Inhibitors and regulation of TCA cycle. Transport of extra mitochondrial NADH – Glycerophosphate shuttle, malate aspartate shuttle. Energetics of metabolic pathways – glycolysis, (aerobic and anaerobic) ,citric acid cycle, beta oxidation (12 Hrs)

**UNIT V:** Activation of sulphate ions – PAPS, APS, SAM and their biological role. Metabolism of xenobiotics – Phase I reactions – hydroxylation, oxidation and reduction. Phase II reactions – glucuronidation, sulphation, glutathione conjugation, acetylation and methylation. Mode of action and factors affecting the activities of xenobiotic enzymes. (12 Hrs)

## **TEXT BOOKS**

1. David L. Nelson and Michael M. Cox (2012) Lehninger Principles of Biochemistry (6th ed), W.H. Freeman
2. Robert K. Murray, Darryl K. Granner, Peter A. Mayes, and Victor W. Rodwell (2012), Harper's Illustrated Biochemistry, (29th ed), McGraw-Hill Medical
3. Metzler D.E (2003). The chemical reactions of living cells (2nd ed), Academic Press.
4. Zubay G.L (1999) Biochemistry , (4th ed), Mc Grew-Hill.
5. Devlin RM (1983) Plant Physiology (4th ed), PWS publishers
6. Taiz L , Zeiger E (2010), Plant Physiology (5th ed), Sinauer Associates, Inc

## **Reference books**

### **Web resources**

1. <https://chemed.chem.purdue.edu/genchem/topicreview/bp/ch21/gibbs.php>
2. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7767752/#:~:text=The%20mitochondrial%20electron%20transport%20chain,cellular%20ATP%20through%20oxidative%20phosphorylation.>
3. [https://www.researchgate.net/figure/Oxidative-phosphorylation-in-mitochondrial-electron-transport-chain-ETC-and-proton\\_fig1\\_230798915](https://www.researchgate.net/figure/Oxidative-phosphorylation-in-mitochondrial-electron-transport-chain-ETC-and-proton_fig1_230798915)
4. <https://www.lyndhurstschools.net/userfiles/84/Classes/851/photosynthesis%20light%20&%20dark%20reactions%20ppt.pdf?id=560837>
5. <https://bajan.files.wordpress.com/2010/05/amphibolic-nature-of-krebs-cycle.pdf>
6. <https://www.sciencedirect.com/topics/medicine-and-dentistry/xenobiotic-metabolism#:~:text=Xenobiotic%20metabolism%20can%20be%20defined,more%20readily%20excreted%20hydrophilic%20metabolites>

<b>I M.Sc (Biochemistry)</b>	<b>LABORATORY COURSE ON BIOMOLECULES AND BIOCHEMICAL TECHNIQUES</b>	<b>PBCP101B</b>
<b>SEMESTER - I</b>		<b>HRS/WK - 5</b>
<b>CORE COURSE III Practical -1</b>		<b>CREDIT – 4</b>

### **I - Biochemical studies and estimation of macromolecules**

1. Isolation and estimation of glycogen from liver.
2. Isolation and estimation of DNA from animal tissue.
3. Isolation and estimation of RNA from yeast.
4. Purification of Polysaccharides –Starch and assessment of its purity

### **II - UV absorption**

1. Denaturation of DNA and absorption studies at 260nm.
2. Denaturation of Protein and absorption studies at 280nm.

### **III - Colorimetric estimations**

1. Estimation of Pyruvate
2. Estimation of tryptophan.

### **IV - Estimation of minerals**

1. Estimation of calcium
2. Estimation of iron

### **V - Plant Biochemistry**

1. Qualitative analysis Phytochemical screening
2. Estimation of Flavonoids -Quantitative analysis

### **VI - Group Experiments**

1. Fractionation of sub-cellular organelles by differential centrifugation-Mitochondria and nucleus
2. Identification of the separated sub-cellular fractions using marker enzymes (any one)
3. Separation of identification of lipids by thin layer chromatography..
4. Separation of plant pigments from leaves by column chromatography
5. Identification of Sugars by Paper Chromatography
6. Identification of Amino acids by Paper Chromatography

### **Text Books**

1. David Plummer (2001) An Introduction to Practical Biochemistry (3rd ed) McGraw Hill Education (India) Private Ltd
2. Jayaraman, J (2011), laboratory Manual in Biochemistry, New age publishers
3. Varley H (2006) Practical Clinical Biochemistry (6th ed) , CBS Publishers
4. O. Debiyi and F. A. Sofowora, (1978) "Phytochemical screening of medical plants," Iloyidia, vol. 3, pp. 234–246,
5. Prof. Sarin A. Chavhan, Prof. Sushilkumar A. Shinde (2019) A Guide to Chromatography Techniques Edition:1
6. Analytical techniques in Biochemistry and Molecular Biology; Katoch, Rajan. Springer(2011)

### **Web References**

1. [https://www.researchgate.net/publication/313745155\\_Practical\\_Biochemistry\\_A\\_Student\\_Companion](https://www.researchgate.net/publication/313745155_Practical_Biochemistry_A_Student_Companion)
2. <https://doi.org/10.1186/s13020-018-0177-x>
3. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5368116/>
4. <https://www.life.illinois.edu/biochem/455/Lab%20exercises/2Photometry/spectrophotometry.pdf>
5. <https://ijpsr.com/bft-article/determination-of-total-flavonoid-and-phenol-content-in-mimusops-elengi-linn/?view=fulltext>
6. <https://skyfox.co/wp-content/uploads/2020/12/Practical-Manual-of-Biochemistry.pdf>

<b>I M.Sc</b>	<b>METABOLISM AND REGULATION</b>	<b>COURSE CODE:</b>
<b>Biochemistry</b>		<b>PBC23B</b>
<b>SEMESTER-II</b>		<b>HRS/WK-5</b>
<b>CORE-VI</b>		<b>CREDIT-4</b>

### OBJECTIVES

- ❖ To understand the biological oxidation, ETC, and Oxidative phosphorylation process performed in cellular work.
- ❖ To provide students with an understanding of key metabolic pathways of carbohydrates and its energy generation.
- ❖ To give insights to general reactions of Amino acids and metabolism of protein.
- ❖ To know the metabolic pathway of lipids and lipids storage disease.
- ❖ To gain skills to interpret how the pathways are regulated by various metabolic and hormonal changes.

### COURSE OUTCOMES (CO's):

**CO1:** To gain insights about the biological oxidation process, high energy compounds and key carbohydrate metabolic pathways such as glycolysis, TCA and ETC.

**CO2:** To understand the key metabolic steps involved in various pathways of carbohydrate metabolism.

**CO3:** To gain knowledge about the metabolic pathways of amino acid metabolism and its related inborn errors.

**CO4:** To gain knowledge about the metabolic pathways of lipid metabolism and its storage diseases.

**CO5:** Able to understand and interpret the metabolic pathways of nucleic acid metabolism and nucleotide coenzymes.

<b>SEMESTER II</b>	<b>COURSE CODE: PBC23B</b>					<b>METABOLISM AND REGULATION</b>								<b>HOURS:5</b>	<b>CREDITS:4</b>
<b>COURSE OUTCOMES</b>	<b>PROGRAMME OUTCOMES(POS)</b>					<b>PROGRAMME SPECIFIC OUTCOMES(PSOS)</b>								<b>MEAN SCORE OF CO'S</b>	
	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO5</b>	<b>PSO 1</b>	<b>PSO 2</b>	<b>PSO 3</b>	<b>PSO 4</b>	<b>PSO 5</b>	<b>PSO 6</b>	<b>PSO 7</b>	<b>PSO 8</b>		
<b>CO1</b>	4	3	4	3	4	5	4	4	3	4	4	3	4	<b>3.8</b>	
<b>CO2</b>	3	3	3	4	4	4	4	4	3	4	3	4	3	<b>3.5</b>	
<b>CO3</b>	4	4	4	5	3	4	4	3	3	4	4	4	3	<b>3.8</b>	
<b>CO4</b>	3	4	5	4	4	3	3	4	4	3	3	4	4	<b>3.7</b>	
<b>CO5</b>	3	4	3	4	3	3	4	5	4	3	4	4	4	<b>3.7</b>	
<b>Mean overall score</b>													<b>3.7</b>		

**Result: The Score of this Course is 3.7 (High)**





## UNIT V      NUCLEIC ACID METABOLISM

[15 hrs]

Nucleotides – Biosynthesis of Purines (de nova and salvage) and biosynthesis of Pyrimidines - catabolism and regulation of purine and pyrimidine biosynthesis. Biosynthesis of  $\text{NAD}^+$  / $\text{NADP}^+$  and  $\text{FAD}^+$ .

### TEXT BOOKS:

1. Nelson, D.L. and Cox, M.M (2021). Lehninger Principles of Biochemistry. 8<sup>th</sup> Edition, W.H. Freeman and Company, New York.
2. U. Sathayanarayana (2006). Biochemistry. 3rd Edition by Books and Allied (P) Ltd., India.
3. Jain, J.L & Jain, (2005) Fundamentals of Biochemistry. Sixth Edition, S.Chand & Company, New Delhi.

### REFERENCE BOOKS:

1. Victor W. Rodwell, 2015. Harpers Illustrated Biochemistry 30th Edition Paper back – Import, 1 Jan
2. Berg, J. M., Tymoczko, J. L. and Stryer, L, 2011. Biochemistry. Freeman, 7th edn,
3. Zubay, G. (2017). Biochemistry, 5th Edition, WCB. Mcgraw-Hill, New York.
4. Donald Voet, Judith, G. Voet, and Charlotte, W Pratt, (2016). Fundamentals of Biochemistry, 5th Edition. John Wiley & Sons, New Jersey.

<b>II M.Sc Biochemistry</b>	<b>PLANT BIOCHEMISTRY</b>	<b>COURSE CODE : PBC32B</b>
<b>SEMESTER-III</b>		<b>HRS/WK-5</b>
<b>CORE: 8</b>		<b>CREDIT-4</b>

### OBJECTIVES

- ❖ To acquire knowledge of the chemistry of important biological processes in plants.
- ❖ To study about the functions and mechanisms of different plant hormones.
- ❖ To acquire knowledge about photosynthesis, metabolism of nitrogen compounds and about molecular mechanisms of signalization and regulation.
- ❖ To acquire knowledge about the importance of secondary metabolites and stress metabolism.
- ❖ To gain thorough knowledge about the nitrogen fixation mechanism

### COURSE OUTCOMES (CO)

**CO1:** Able to gain knowledge about the different components of plant cells apart from mechanism of absorption by plants.

**CO2:** To get in-depth knowledge about the functions and mechanisms of different plant hormones.

**CO3:** To acquire knowledge about the steps and mechanisms involved in photosynthesis of plants.

**CO4:** To know and interpret the different secondary metabolites present in the plants and its stress adaptation.

**CO5:** To gain thorough understanding about the nitrogen fixing mechanisms adopted by the soil microbes.

SEMESTER III	Course Code: PBC32B					PLANT BIOCHEMISTRY								HOURS:5 CREDITS:4
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(P SO)								MEAN SCORE OF CO'S
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	
CO1	4	4	3	5	4	3	4	3	4	5	4	3	4	3.8
CO2	5	3	4	4	3	4	5	4	3	4	5	4	3	3.9
CO3	4	4	3	3	4	5	3	4	3	4	5	3	4	3.8
CO4	5	3	3	4	3	3	5	3	4	3	4	4	3	3.6
CO5	4	4	3	4	4	5	4	4	4	3	4	3	4	3.8
<b>Mean overall score</b>													<b>3.8</b>	

**Result: The Score of this Course is 3.8 (High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcome and Programme Specific Outcome

### **UNIT I PLANT CELL & ABSORPTION [10 hrs]**

Discovery and definition of plant cell – cell wall, plasmadesmata, meristematic cells, and secretory systems. Mechanism of absorption .Ion exchange passive absorption. Active absorption .The carrier concept. Donnan’s equilibrium.

### **UNIT II PLANT HORMONES [10 hrs]**

Structure, biosynthesis, mode of action & physiological effects of auxins, giberellins, cytokinins and IAA. Biochemistry of seed dormancy, seed germination, fruit ripening and senescence.Synthetic seeds.

### **UNIT III PLANT PIGMENTS & PHOTOSYNTHESIS [20 hrs]**

Structure & synthesis of chlorophyll, phycobilins and carotenoids. Photosynthesis photosystem I & II- Light absorption, Hill reaction, Red drop & Emerson’s enhancement effect. Cyclic and non-cyclic photophosphorylation, Calvin cycle. Photosynthesis-factors and regulation. Chloroplast ATP synthase, complexes associated with thylakoid membranes, light harvesting complexes. C3, C4 pathway and CAM.

### **UNIT IV SECONDARY METABOLITES &STRESS METABOLISM [15 hrs]**

Secondary metabolites in plants –classification & function of alkaloids, terpenoids, tannins, polyphenols, flavanoids, saponins, lignin and pectin. Stress metabolism in plants - Environmental stresses, salinity, water stress, heat, Heavy metals, radiations ,chilling and their impact on plant growth.

### **UNIT V NITROGEN FIXING ORGANISMS [20hrs]**

Nitrogen fixation: Structure and mechanism of action of nitrogenase: Rhizobium symbiosis. Leghaemoglobin; strategies for protection of nitrogenase against the inhibitory effect of oxygen; nif genes of klebsiella pneumoniae including their regulation. Nitrate Assimilation: Nitrate reductase; regulation of nitrate assimilation. Ammonia assimilation by glutamine synthetase- glutamine oxoglutarate amino transferase (GS-GOGAT). Nitrite and nitrate reductase.

**TEXTBOOKS :**

- 1.Jain.V.K., 2005. Fundamentals of Plant Physiology, revised 1<sup>st</sup> edition S.Chand and Co.
- 2.Verma,2001. Plant physiology, 7th Revised edition, Emkay Publications.
- 3.S. N. Pandey and B.K. Sinha, 1999.Vikas Publishing House Pvt. Ltd, 3rd edition, Plant Physiology

**REFERENCE BOOKS:**

- 1.Solisbury and Ross,Plant Physiology,3rd edition,CBS Publishers and Distributors.
- 2.Hans-Walter Held,Plant Biochemistry, 3rd edition,Elsevier India Pvt.Ltd.
- 3.Bonner and Varner, Plant Biochemistry, 3rd edition,Academic Press.
- 4.Bowsher, C, Steer, M. and Tobin, A (2008). Plant Biochemistry. Garland Science,Taylor and Francis Group, LLC. New York.

<b>II M.Sc Biochemistry</b>	<b>ENDOCRINOLOGY</b>	<b>COURSE CODE: PBC33A</b>
<b>SEMESTER-III</b>		<b>HRS/WK-5</b>
<b>CORE-9</b>		<b>CREDIT-4</b>

### OBJECTIVES

- ❖ To provide students with a broad understanding of the major human endocrine glands and their hormones, together with understanding hormones action and their effect on target cells.
- ❖ To provide students with an understanding of the medical conditions resulted from abnormal hormone secretion and the laboratory tests that are used to diagnose these conditions

### COURSE OUTCOMES (CO's):

**CO1:**To gain the knowledge about the functions of pituitary, hypothalamus and pineal gland hormones and its regulations.

**CO2:**To learn and understand the structure and functions of thyroid, parathyroid hormones and its regulations.

**CO3:**To understand the structure and functions of gastrointestinal and pancreatic hormones.

**CO4:**To acquire the knowledge about the structure and functions of adrenal hormones and its regulation.

**CO5:**To gain the knowledge about the structure and functions of male and female sex hormones and its regulation.

SEMESTER III	SUB CODE: PBC33A					ENDOCRINOLOGY								HOURS:5 CREDITS:4
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)								MEAN SCORE OF CO'S
	PO 1	PO 2	PO 3	PO 4	PO5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	
CO1	4	4	3	4	4	4	4	3	5	4	5	3	4	3.9
CO2	3	3	4	4	3	3	4	3	4	4	5	2	4	3.5
CO3	4	4	5	3	3	4	3	4	3	4	3	4	3	3.6
CO4	4	5	4	3	3	3	4	3	4	4	4	3	4	3.7
CO5	3	4	4	3	3	5	4	4	4	3	4	3	3	3.6
Mean overall score													3.7	

**Result: The Score of this Course is 3.7 (High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This course is having **HIGH** association with programme outcome and programme specific outcome

### **UNIT I HYPOTHALAMIC, PITUITARY & PINEAL GLAND HORMONES [15 hrs]**

Definition & Classification - Mechanism of hormone action. Definition of signals, ligands and receptors, endocrine, paracrine and autocrine signalling. Pituitary Hormones: Anatomy of pituitary gland, hormones of the pituitary, Hypothalamic releasing factors, Anterior pituitary hormones: biological actions, regulation and disorders of growth hormones, ACTH, gonadotrophins prolactin and Leptin. Posterior pituitary hormones: vasopressin and Oxytocin - biological actions, regulation and disorders, MSH. Pineal gland - melatonin hypothesis, melatonin secretion and circulation, proposed role of pineal gland and mechanism of action. Hormonal action of Serotonin.

### **UNIT II THYROID & PARATHYROID HORMONES [15 hrs]**

Thyroid hormones – synthesis, secretion, regulation, transport, metabolic fate and biological actions. Antithyroid agents. Parathyroid hormone - Synthesis, Secretion and biological actions. Calcitonin and calcitriol - Hormonal regulation of calcium and phosphate metabolism. Hypercalcemia and hypocalcemia, Rickets and osteomalacia

### **UNIT III ADRENAL & GASTRO INTESTINAL HORMONES [15 hrs]**

Adrenal gland structure. Adrenal cortical hormones - Synthesis, regulation, transport, metabolism and biological effects. Cushing's syndrome, aldosteronism, congenital adrenal hyperplasia, adrenal cortical insufficiency. Adrenal medullary hormones – synthesis, secretion, metabolism, regulation and biological effects of catecholamines. Pheochromocytoma. G.I. Tract hormones – chemical nature & functions of Gastrin, Enterogastin, Secretin & Cholecystokinin. Adiponectin.

### **UNIT-IV PANCREATIC HORMONES [15 hrs]**

**Pancreatic hormones** – cell types of islets of Langerhans - synthesis, regulation, biological effects and mechanism of action of glucagon and insulin. Somatostatin, Pancreatic polypeptide and Ghrelin.

### **UNIT V SEX HORMONES [15 hrs]**

**Male sex hormones:** Biosynthesis, regulation, transport, metabolism and biological actions of androgens. Hypogonadism and gynecomastia.

**Female sex hormones:** Biosynthesis, regulation, transport, metabolism and biological effects of oestrogen and progesterone. The menstrual cycle. Amenorrhoea.

**TEXT BOOKS:**

1. Robert Murray, Bender, (2012) Harper's Illustrated Biochemistry.
2. Williams Textbook of Endocrinology – Wilson and Foster 8th ed.
3. Guyton, A.C. and Hall, J.E (2006), Textbook of Medical Physiology, 11th Edition, Saunders Co. Pennsylvania.

**REFERENCES:**

1. Principles of Biochemistry – Mammalian Biochemistry – Smith. McGraw Hill 7th ed
2. Nelson, D. L. & Cox, M. M, 2008. Lehninger Principles of Biochemistry. 5th edn, Freeman.
3. Wilson and Foster, 1992, Textbook of Endocrinology, (8th edn), W.B. Saunders, USA.
4. Mac. E. Hadley and Jon. E. Levin, 2009, Endocrinology 6th ed., Darling Kindersly Pvt. Ltd., India



<b>II M.Sc</b>	<b>BIOCHEMICAL TOXICOLOGY</b>	<b>COURSE CODE:</b>
<b>Biochemistry</b>		<b>PBC34A</b>
<b>SEMESTER-III</b>		<b>HRS/WK-5</b>
<b>ELECTIVE-3</b>		<b>CREDIT-4</b>

### OBJECTIVES

1. To understand the detailed study of biochemical basis of drugs and its toxicity, particularly their actions on living systems.
2. To understand the relevance and methods to identify the chemotherapeutic value of drug.
3. To understand the fundamentals of toxicology and dose- response relationships.
4. To understand the toxicological drug testing procedures based on in vitro and animal studies
5. To understand biochemical pathways of drug toxicity and its manifestation on vital organs.

### Course Outcomes (CO's)

**CO1:** To appreciate and understand the role of toxicological biomarkers to assess drug toxicities.

**CO2:** To conceive the role of disposition of drug in human system and their metabolism and methodologies pertaining to toxicological studies.

**CO3:** To understand and evaluate the functions of different organs on drug disposition and associated drug toxicities.

**CO4:** To understand the toxicological response to foreign compounds and their pharmacological, physiological and biochemical effects.

**CO5:** To link the mechanism of toxicity and clinical symptoms with underlying physiological disturbances.

SEMESTER III	COURSE CODE: PBC34A					BIOCHEMICAL TOXICOLOGY								HOURS:5 CREDITS :4
COURSE OUTCOMES	PROGRAMME OUTCOMES(POS)					PROGRAMME SPECIFIC OUTCOMES(PSOS)								MEAN SCORE OF CO'S
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	
CO1	5	4	4	3	4	3	4	4	3	4	3	5	4	3.8
CO2	4	4	3	4	3	3	4	4	4	5	5	4	4	3.9
CO3	4	3	4	3	4	3	4	5	4	3	3	3	4	3.6
CO4	3	4	4	3	3	4	3	4	4	4	3	4	3	3.5
CO5	4	3	3	4	3	4	3	4	4	3	4	4	3	3.6
<b>Mean overall score</b>													<b>3.7</b>	

**Result: The Score of this Course is 3.7 (High)**

Association	1% -20%	21% -40%	41% -60%	61% -80%	81% -100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

### **UNIT I Fundamentals of Toxicology and dose-Response Relationships [12 Hrs]**

Introduction Biomarkers Criteria of Toxicity New Technologies Evaluation of Toxicity Interactions; Dose Response; Measurement of Dose-Response; Relationships Linear Dose Response Hormesis; Hazard and Risk Assessment Duration and Frequency of Exposure and Effect.

### **UNIT II Factors Affecting Toxic Responses [12 Hrs]**

Disposition: Absorption, Sites of absorption, distribution, Excretion; Metabolism: types of Metabolic change phase I reactions; Phase 2 reactions; control of Metabolism, Toxication vs. Detoxication.

### **UNIT III Toxicity testing [12 Hrs]**

Test protocol, Genetic toxicity testing & Mutagenesis assay: In vitro test systems: bacterial mutation tests-Reversion test, Ames test, Fluctuation test, and Eukaryotic mutation test. In vivo test system Mammalian mutation test-Host mediated assay and Dominant Lethal test. Biochemical basis of toxicity: Mechanism of toxicity: Disturbance of excitable membrane function, Altered Calcium homeostasis, Covalent binding to cellular macromolecules & genotoxicity, Tissue specific toxicity.

### **UNIT IV Toxic Responses to Foreign Compounds [12 Hrs]**

Direct Toxic Action: Tissue Lesions; Mechanism and response in cellular toxicity, pharmacological, physiological and Biochemical effects; Developmental Toxicology-Teratogenesis; Immunotoxicity Genetic Toxicity; Chemical Carcinogenesis.

### **UNIT V Biochemical Mechanisms of Toxicity [12 Hrs]**

Tissue Lesions: Liver Necrosis; kidney Damage; Lung Damage, Liver damage, Cardiac damage; Neurotoxicity; Exaggerated and Unwanted pharmacological effects; Physiological effects; Biochemical Effects: Lethal Synthesis and Incorporation, Interaction with specific Protein Receptors; Teratogenesis; Immunotoxicity; multi-Organ Toxicity.

### **TEXT BOOKS**

1. Textbook of Drug Design. Krogsgaard-Larsen, Liljefors and Madsen (Editors), Taylor and Francis, London UK, 2002.
2. Drug Discovery Handbook S.C. Gad (Editor) Wiley-Interscience Hoboken USA, 2005
3. Pharmacology in Drug Discovery. T. P. Kenakin. Elsevier, 1st Edition 2012.

### **REFERENCE BOOKS**

1. Practical Application of Computer-Aided Drug Design, Ed. Charifson P., Marcel Dekker Inc.
2. 3D QSAR in Drug Design: Theory, Methods and Applications, Ed. Kubinyi H., Ledien
3. Pharmaceutical Profiling in Drug Discovery for Lead Selection, Borhardt RT, Kerns, EH, Lipinski CA, Thakker DR and Wang B, AAPS Press, 2004
4. Drug Discovery and Development; Technology in Transition. HP Rang. Elsevier Ltd 1st edition 2006.

<b>I M.Sc (Biochemistry)</b>	<b>LABORATORY COURSE ON ENZYMOLGY, MICROBIOLOGY &amp; NUTRITION</b>	<b>Course Code-PBC22B</b>
<b>SEMESTER – II</b>		<b>HRS / WEEK: 8</b>
<b>PRACTICAL – II</b>		<b>CREDITS: 6</b>

I. Preparation of buffers

II. Titration curve

### **III. Alkaline Phosphatase**

- a. Isolation of Alkaline Phosphatase from goat kidney.
- b. Purification of alkaline phosphatase
- c. Checking the purity using SDS-PAGE
- d. Determination of optimum pH and temperature of alkaline phosphatase.
- e. Determination of specific activity and Km of alkaline phosphatase.
- f. Effect of activators and inhibitors on the activity of alkaline phosphatase.

### **IV. Salivary amylase**

- a. Effect of pH on the activity of salivary amylase
- b. Effect of temperature on the activity of salivary amylase
- c. Effect of substrate concentration on the activity of salivary amylase
- d. Determination of specific activity of salivary amylase

### **V. Microbiology**

- a. Safety measures and Good Laboratory Practices in microbiology laboratory
- b. Sterilization, Culture and inoculum preparation
- c. Staining of bacteria – Gram Staining

### **VI. Group Experiments**

- a. Separation of proteins based on molecular weight by SDS PAGE
- b. Agarose gel electrophoresis of genomic DNA
- c. Separation of amino acid by thin layer chromatography

## **TEXT BOOKS**

1. Harold Varley, (1980). Practical Clinical Biochemistry, Volume I and II. 5th Edition. CBS Publishers. New Delhi.
2. Jayaraman, S. (2003). Laboratory Manual in Biochemistry. 2nd Edition .New Age International (P) Limited. New Delhi.
3. Sadasivam S and Manickam P. (2004) Biochemical Methods. 2nd Edition. New Age International (P) Limited. New Delhi.

## **REFERENCE BOOKS**

1. David, T. Plummer, (1988). An Introduction to Practical Biochemistry. 3rd Edition. Tata McGraw Hill Publishing Company Ltd. New Delhi.
2. Pattabiraman, T.N. (1998). Laboratory Manual in Biochemistry. 3rd Edition. All India Publishers and Distributors. Chennai.

<b>I B.Sc (Biochemistry)</b>	<b>NUTRITIONAL BIOCHEMISTRY</b>	<b>COURSE CODE: BC101B</b>
<b>SEMESTER-I</b>		<b>HRS/WK-4</b>
<b>CORE-1</b>		<b>CREDIT-2</b>

### LEARNING OBJECTIVES

The objectives of this course are to

- Create awareness about the role of nutrients in maintaining proper health
- Understand the nutritional significance of carbohydrates, lipids and proteins.
- Understand the importance of a balanced diet.
- Study the effect of additives, emulsifiers, flavour enhancing substances in food.
- Study the significance of nutraceuticals.

### COURSE OUTCOMES (CO's):

**CO1-** Cognizance of basic food groups viz. Carbohydrates, proteins and lipids and their nutritional aspects as well as calorific value

**CO2-** Identify and explain nutrients in foods and the specific functions in maintaining health.

**CO3-** Classify the food groups and its significance

**CO4-** Understand the effect of food additives

**CO5-** Describe the importance of nutraceuticals and pigments

<b>SEMESTER I</b>	<b>COURSE CODE : BC101B</b>					<b>NUTRITIONAL BIOCHEMISTRY</b>								<b>HOURS:4 CREDITS :4</b>
<b>COURSE OUTCOME S</b>	<b>PROGRAMME OUTCOMES(POS)</b>					<b>PROGRAMME SPECIFIC OUTCOMES(PSOS)</b>								<b>MEAN SCORE OF CO'S</b>
	<b>PO 1</b>	<b>PO2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>	<b>PSO6</b>	<b>PSO7</b>	<b>PS O8</b>	
<b>CO1</b>	3	5	2	2	2	4	4	4	3	2	4	4	4	3.3
<b>CO2</b>	5	4	2	3	2	5	5	5	5	3	3	4	3	3.8
<b>CO3</b>	4	5	3	2	3	4	4	4	4	3	4	3	4	3.6
<b>CO4</b>	5	4	2	2	2	3	5	5	3	2	3	4	4	3.4
<b>CO5</b>	4	5	2	3	3	5	5	5	5	2	4	4	4	3.4
<b>Mean overall score</b>													<b>3.5</b>	

**Result: The Score of this Course is 3.5 (High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **High** association with Programme Outcome and Programme Specific Outcome

**UNIT I** : Concepts of food and nutrition. Basic food groups-energy yielding, body building and functional foods. Modules of energy. Calorific and nutritive value of foods. Measurement of Calories by bomb calorimeter. Basal metabolic rate (BMR)- definition, determination of BMR and factors affecting BMR. Respiratory quotient (RQ) of nutrients and factors affecting the RQ. SDA-definition and determination- Anthropometric measurement and indices – Height, Weight, chest and waist circumference BMI. (12 Hrs)

**UNIT II**: Physiological role and nutritional significance of carbohydrates, lipids and protein. Evaluation of proteins by nitrogen balance method- Biological value of proteins- Digestibility coefficient, , Protein Energy Ratio and Net Protein Utilization. Protein energy malnutrition – Kwashiorkar and Marasmus, Obesity-Types and preventive measures. (12 Hrs)

**UNIT III** : Balanced diet, example of low and high cost balanced diet- for infants, children, adolescents, adults and elderly people. ICMR classification of five food groups and its significance food pyramid. Junk foods- definition and its adverse effects . (12 Hrs)

**UNIT IV**: Food additives: Structure, chemistry, function and application of preservatives, emulsifying agents, buffering agents, stabilizing agents, natural and artificial sweeteners, bleaching, starch modifiers, antimicrobials, food emulsions, fat replacers, viscosity agents, gelling agents and maturing agents. Food colors, flavors, anti-caking agent, antioxidants. Safety assessment of food additives. (12 Hrs)

**UNIT V**: Nutraceuticals and Functional Foods: Definition, properties and function of Nutraceuticals, food Supplements, dietary supplements prebiotics and probiotics, and functional Foods. Food as medicine. Natural pigments from plants– carotenoids, anthocyanins and its benefits. (12 Hrs)

#### **TEXT BOOKS**

1. Gaile Moe, Danita Kelley, Jacqueline Berning and Carol Byrd-Bredbenner. 2013. Wardlaw's Perspectives in Nutrition: A Functional Approach. McGraw-Hill, Inc., NY, USA.
2. M. Swaminadhan (1995) Principles of Nutrition and Dietetics. Bappco.
3. Tom Brody (1998). Nutritional Biochemistry (2nd ed), Academic press, USA
4. Garrow, JS, James WPT and Ralph A (2000). Human nutrition and dietetics (10th ed) Churchill Livingstone.
5. Andreas M. Papas (1998). Antioxidant Status, Diet, Nutrition, and Health (1st ed) CRC

### **REFERENCE BOOKS**

1. Branen, A.L., Davidson PM & Salminen S. 2001. Food Additives. 2nd Ed. Marcel Dekker.
2. Gerorge, A.B. 1996. Encyclopedia of Food and Color Additives. Vol. III. CRC Press.
3. Advances in food biochemistry, Fatih Yildiz (Editor), CRC Press, Boca Raton, USA, 2010
4. Food biochemistry & food processing, Y.H. Hui (Editor), Blackwell Publishing, Oxford, UK, 2006.
5. Geoffrey Campbell-Platt. 2009. Food Science and Technology. Wiley-Blackwell, UK.

<b>I B.Sc (Biochemistry)</b>	<b>MEDICINAL DIET</b>	<b>COURSE CODE: NBC101</b>
<b>SEMESTER-I</b>		<b>HRS/WK-2</b>
<b>Skill Enhancement Course-1</b>		<b>CREDIT-2</b>

### LEARNING OBJECTIVES

The main objectives of this course are to

- Provide basic knowledge about diet
- Understand of diet modification for GI diseases
- Plan a diet for liver diseases
- Prepare diet chart for Infectious diseases
- Plan a diet for Diabetes ,Renal and Cardio-vascular diseases

### COURSE OUTCOMES

**CO1**-Possess basic knowledge about diet

**CO2**- Sketch diet plan for GI diseases

**CO3**- Sketch diet plan for liver diseases

**CO4**- Sketch a diet plan for Infectious diseases

**CO5**- Prepare diet chart for Diabetes, Renal and Cardio-vascular diseases

SEMESTER I	COURSE CODE : NBC101					MEDICINAL DIET								HOURS:2 CREDITS :2
COURSE OUTCOME S	PROGRAMME OUTCOMES(POS)					PROGRAMME SPECIFIC OUTCOMES(PSOS)								MEAN SCORE OF CO'S
	PO 1	PO2	PO 3	PO 4	PO 5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PS O8	
CO1	5	4	3	4	4	3	4	3	5	4	3	4	4	3.8
CO2	4	3	3	5	5	3	3	4	5	4	5	4	4	4.0
CO3	3	5	3	3	3	4	5	3	3	5	4	3	5	3.8
CO4	3	4	4	5	5	3	2	4	5	4	5	3	4	3.7
CO5	5	3	3	3	3	2	3	3	5	3	3	2	3	3.2
Mean overall score													3.7	

**Result: The Score of this Course is 3.7 (High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **High** association with Programme Outcome and Programme Specific Outcome



**UNIT-I :**Principles of Therapeutic Diet: Definitions of Normal diet, Therapeutic diet, soft Diet and Liquid diet. Objectives of Diet Therapy. Advantages of using normal diet as the basis for Therapeutic diet. Normal Diet-therapeutic modification of normal diet. **[6 Hrs]**

**UNITII:** Diet modification in Gastrointestinal diseases: Peptic ulcer, Diarrhea, Lactose intolerance, Constipation and Malabsorption syndrome **[6 Hrs]**

**UNIT III:** Diet Modification in liver and gall bladder in diseases: Etiology, symptoms and dietary treatment in jaundice, hepatitis, cirrhosis of liver and hepatic coma. **[6 Hrs]**

**UNIT IV:** Diet Modification in Infectious Diseases: Fevers, Typhoid, Tuberculosis and Viral Hepatitis. Dietary modifications in Tuberculosis. **[6 Hrs]**

**UNIT V:** Diet Modification in Diabetes ,Renaland Cardio-vascular diseases-Diabetes, acute & chronic glomerulonephritis, nephrosis, renal failure, kidney stone and Hypertension.**[6 Hrs]**

#### **TEXT BOOKS**

- 1.M.RaheenaBegum ,AText Book of Foods, Nutrition and Dietetics, Sterling Publishers Pvt.Ltd.
- 2.M.V.RajaGopal ,Sumati.R.,Mudambi, Fundamentals of foods and Nutrition, Wiley Eastern Limited, Year-1990.
- 3.William S.R Nutrition and Diet Therapy, 1985, 5<sup>th</sup>edition, MoslyCo.St.Louis.

#### **REFERENCE BOOKS**

- 1.Rodwell Williams Nutrition and Diet Therapy, 1985,the C.V MoslySt.Louis.
- 2.M.V.Krause&M.A.Mohan ,Food Nutrition and Diet Therapy, 1992 by W.B Saunders Company, Philadelphia, London.
- 3.Davidson and Passmore ,Human Methods and Diabetics, 1976 the English Language Book Society and Churchill.

<b>I B.Sc</b> <b>(Biochemistry)</b>	<b>FIRST AID</b>	<b>COURSE CODE:</b> <b>FBC101</b>
<b>SEMESTER-I</b>		<b>HRS/WK-2</b>
<b>Foundation Course I</b>		<b>CREDIT-2</b>

## LEARNING OBJECTIVES

The main objectives of this course are to:

- Provide knowledge on the basics of first aid.
- Perform first aid during various respiratory issues.
- Demonstrate the first aid to treat injuries.
- Learn the first aid techniques to be given during emergency.
- Familiarize the first aid during poisoning.

## COURSE OUTCOMES (CO's):

**CO1-**Discuss on the rules of first aid, dealing during emergency and first aid techniques

**CO2-** Understand the first aid techniques to be given during different types of respiratory problems

**CO3-** Provide first aid for injuries, shocks and bone injury

**CO4-** Detail on the first aid to be given for unconsciousness, stroke, fits and convulsions

**CO5-** Gain expertise in giving first aid for insect bites and chemical poisoning

SEMESTER I	COURSE CODE : FBC101					COURSE TITLE :FIRST AID								HOURS:2 CREDITS:2
COURSE OUTCOMES	PROGRAMME OUTCOMES(POS)					PROGRAMME SPECIFIC OUTCOMES(PSOS)								MEAN SCORE OF CO'S
	PO 1	PO 2	PO 3	PO 4	PO 5	PS O1	PS O2	PS O3	PS O4	PS O5	PS O6	PS O7	PS O8	
CO1	5	4	3	5	4	4	4	3	4	4	5	4	5	4.15
CO2	4	5	3	4	5	4	4	3	4	4	4	5	3	3.92
CO3	4	4	5	4	5	5	4	4	4	4	3	3	4	4.07
CO4	3	4	4	5	4	5	3	3	3	5	5	3	3	3.84
CO5	4	3	3	4	4	5	5	4	5	4	4	5	4	4.15
<b>Mean Overall Score</b>													<b>4</b>	

**Result: The Score of this Course is 4.0 (High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **High** association with Programme Outcome and Programme Specific Outcome

**UNIT I:** Aims and important rules of first aid, dealing with emergency, types and content of a first aid kit. First aid technique – Dressing and Bandages, fast evacuation technique, transport techniques.

**[6 Hrs]**

**UNIT II:** Basics of Respiration – CPR, first aid during difficult breathing, drowning, choking, strangulation and hanging, swelling within the throat, suffocation by smoke or gases and asthma.  
**[6 Hrs]**

**UNIT III:** Common medical aid- first aid for wounds, cuts, head, chest, abdominal injuries, shocks, burns, amputations, fractures, dislocation of bones. **[6 Hrs]**

**UNIT IV:** First aid related to unconsciousness, stroke, fits, convulsions- seizures, epilepsy  
**[6 Hrs]**

**UNIT V:** First aid in poisonous bites (Insects and snakes), honey bee stings, animal bites, disinfectant, acid and alkali poisoning. **[6 Hrs]**

#### **TEXT BOOKS**

- 1) First aid and health Dr. Gauri Goel, Dr. Kumkum Rajput, Dr. Manjul Mungali  
ISBN-978-93-92208-19-5
- 2) Indian First Aid Manual-<https://www.indianredcross.org/publications/FA-manual.pdf>
- 3) Red Cross First Aid/CPR/AED Instructor Manual

#### **REFERENCE BOOKS / WEB RESOURCES**

- 1) <https://www.redcross.org/take-a-class/first-aid/first-aid-training/first-aid-online> •
- 2) <https://www.firstaidforfree.com/>

<b>I B.Sc (Biochemistry)</b>	<b>BIOMOLECULES</b>	<b>COURSE CODE:BC203B</b>
<b>SEMESTER-II</b>		<b>HRS/WK-4</b>
<b>CORE-2</b>		<b>CREDIT-4</b>

**OBJECTIVES:**

- ❖ To provide information about the chemistry, classifications with examples and applications of carbohydrates.
- ❖ To understand the chemical nature, classifications and functions of amino acids and proteins
- ❖ To gain knowledge about the lipid molecules.
- ❖ To acquire knowledge about structure and properties of nucleic acids.
- ❖ To understand the structure and biological significance of heterocyclic compounds

**COURSE OUTCOMES (CO's):**

**CO1-**Students are able to understand the structure and types of carbohydrates.

**CO2-**Students are able to comprehend the classification of amino acids, proteins and their properties.

**CO3-**Students are able to gain knowledge about classification and properties of lipids.

**CO4-**Students are able to acquire knowledge about the structure and types of DNA and RNA

**CO5-**Students are able to exhibit the understanding about the structure and functions of heterocyclic compounds

<b>SEMESTER II</b>	<b>SUB CODE: BC203B</b>					<b>BIOMOLECULES</b>								<b>HOURS:4 CREDITS:4</b>
<b>COURSE OUTCOME S</b>	<b>PROGRAMME OUTCOMES(PO)</b>					<b>PROGRAMME SPECIFIC OUTCOMES(PSO)</b>								<b>MEAN SCORE OF CO'S</b>
	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO5</b>	<b>PSO 1</b>	<b>PSO 2</b>	<b>PSO 3</b>	<b>PSO 4</b>	<b>PSO 5</b>	<b>PSO 6</b>	<b>PSO 7</b>	<b>PSO 8</b>	
<b>CO1</b>	4	5	4	3	4	4	4	4	3	4	3	4	4	<b>3.5</b>
<b>CO2</b>	3	4	4	4	4	4	3	4	4	4	3	4	4	<b>3.8</b>
<b>CO3</b>	4	4	3	4	4	3	4	4	4	3	4	3	4	<b>3.7</b>
<b>CO4</b>	4	4	4	3	4	3	3	3	5	5	5	5	3	<b>4.3</b>
<b>CO5</b>	4	4	4	4	3	4	3	3	3	4	3	4	3	<b>3.7</b>
<b>Mean overall score</b>													<b>3.8</b>	

**Result: The Score of this Course is 3.8 (High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	$0 \leq \text{rating} \leq 1$	$1.1 \leq \text{rating} \leq 2$	$2.1 \leq \text{rating} \leq 3$	$3.1 \leq \text{rating} \leq 4$	$4.1 \leq \text{rating} \leq 5$
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcome and Programme Specific Outcome

### **UNIT I CARBOHYDRATES I [12hrs]**

Carbohydrates: definition, classification – monosaccharides, oligosaccharides and polysaccharides; occurrence, structure and functions of monosaccharides (glucose and fructose). General properties with reference to glucose, anomers, epimers, enantiomers and mutarotation. Ring and straight chain structure of glucose (Haworth projection formula). Structure, occurrence, properties and biological importance of disaccharides (sucrose, lactose, maltose). Structure, occurrence, properties and biological importance of polysaccharides: Storage polysaccharides (starch), Structural polysaccharides (cellulose) and Heteropolysaccharide (hyaluronic acid).

### **UNIT II - AMINO ACIDS & PROTEIN [12hrs]**

Classification of Amino acids based on structure & polarity. Essential & non essential amino acids, Non protein amino acids. General properties of amino acids. Classification of proteins based on size and shape, solubility, composition & functions. Peptide bond. General reactions of proteins (Reactions of both  $\text{NH}_2$  group &  $\text{COOH}$  group). Structure of proteins- primary, secondary, tertiary & quaternary, forces stabilizing the structure of proteins. Ramachandran plot.

### **UNIT III - LIPIDS [12 hrs]**

Lipids - definition and classification of lipids, Physical properties, classification of fatty acids – saturated, unsaturated and essential fatty acids, properties of fatty acids (Iodine number, Acid number, RM number, Saponification number and Rancidity. structure and functions. Fatty acids: saturated, unsaturated and hydroxy fatty acids. PUFA, significance of omega 3 and 6 fatty acids, DHA. Phospholipids and glycolipids – structure and functions. Structure and functions of cholesterol. Lipids as signal, cofactor and pigments.

#### **UNIT IV      NUCLEIC ACIDS**

**[12hrs]**

Nucleic acids – Bases, Nucleosides and Nucleotides, Phosphodiester linkage, DNA and RNA, Structure –double helical structure of DNA, Properties of DNA – Denaturation, Renaturation,  $T_m$  and Hyperchromicity, Effect of acid & alkali on DNA. Types of DNA, Structure of RNA and its major types - tRNA, mRNA and rRNA.

#### **UNIT V      HETEROCYCLIC COMPOUNDS**

**[12hrs]**

Porphyrin nucleus and its classification, functions of Bile pigments. Biological importance of Heterocyclic compounds- Thiazole, Indole, Pyridine, Pteridine, Pyrrole and Imidazole.

#### **TEXT BOOKS:**

1. RenukaHarikrishnan. 2002. “Biomolecules and Enzymes. second edition, Indrajya Pathipagam, Madurai.
2. JainJ.L., Sanjay Jain and Nitin Jain. 2005. “Fundamentals of Biochemistry”6<sup>th</sup>Edition, S.Chand& Company Ltd,New Delhi.

#### **REFERENCE BOOKS:**

1. Power & Chatwal. 2001.“Biochemistry”. 4<sup>th</sup>edition,Himalaya Publishing House.
2. Cambell&Farrell.2007, “Biochemistry”. 5<sup>th</sup> edition, Delhi, Baba Borkhanath printers.
3. Pattabiraman T.N.2000.“Principles of Biochemistry”.7<sup>th</sup> edition, Bangalore, Gajanana Book Publishers and Distributors.
4. DebA.C, 2004,“Fundamentals of Biochemistry”. 8<sup>th</sup> edition, Kolkata, New Central Book Agency.
5. Lehninger, Nelson And Cox. 2007.“Principles of Biochemistry”.6th edUK, Macmillan Worth Publishers.

<b>I B.Sc (Biochemistry)</b>	<b>CELL BIOLOGY</b>	<b>COURSE CODE: BC204B</b>
<b>SEMESTER-II</b>		<b>HRS/WK-4</b>
<b>CORE-3</b>		<b>CREDIT-4</b>

**OBJECTIVES:**

- ❖ To provide the various mechanisms of membrane transport systems involved in cell membrane.
- ❖ To understand the structure and basic components of the Cell and its organelles.
- ❖ To understand the phases of cell cycle and cell division.
- ❖ To acquire knowledge about microfilaments and microtubules.
- ❖ To understand the mechanism of cell signalling

**COURSE OUTCOMES (CO's):**

**CO1:** To understand the structure and basic components of prokaryotic and eukaryotic cells and also gain insights about various types of membrane transport.

**CO2:** Students gain knowledge and understanding about the morphology, types and functions of cell organelles such as lysosomes, ribosomes and chloroplast.

**CO3:** Students acquire knowledge about the morphology and functions of cell organelles like Mitochondria, Golgi complex and micro bodies.

**CO4:** To understand the structure and functions of chromosomes and learn the phases of cell cycle and cell division.

**CO5:** Students are able to understand the components and functions of cytoskeleton and cell adhesion molecules.

SEMESTER II	COURSE CODE: BC204B					CELL BIOLOGY								HOURS:4 CREDITS:4
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)								MEAN SCORE OF CO'S
	PO 1	PO 2	PO 3	PO 4	PO5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	
CO1	5	5	2	2	2	5	2	5	3	2	5	5	4	3.6
CO2	5	5	2	2	2	5	2	2	2	2	2	5	3	3.0
CO3	5	5	2	2	2	5	2	2	2	2	2	5	3	3.0
CO4	5	5	2	2	5	5	3	5	5	5	5	5	2	3.9
CO5	5	5	2	2	2	5	2	3	2	2	5	5	3	3.0
Mean overall score													3.3	

**Result: The Score of this Course is 3.3 (High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcome and Programme Specific Outcome

### **UNIT I CELL AND TRANSPORT**

**[12 hrs]**

Prokaryotic and eukaryotic cell. Cell membrane: chemical composition of Fluid Mosaic Model. Carbohydrate, lipids, proteins and their function in FMM. Membrane transport – Types of transport, passive- (diffusion, facilitated diffusion, osmosis) and active transport- $\text{Na}^+$ - $\text{K}^+$ , ATPase, sodium potassium pump,  $\text{Ca}^{2+}$  and  $\text{ATP}_{\text{ase}}$  pumps, endocytosis and exocytosis. Symport and antiport. Ion channels, ionophores.

### **UNIT II CELL ORGANELLES –I**

**[12 hrs]**

Endoplasmic reticulum: occurrence, morphology, types and functions. Enzymes of the ER membrane. Lysosomes: structure, types and chemical composition and enzymes of lysosomes. Ribosomes: structure, types and functions. Chloroplast – structure and functions.

### **UNIT III CELL ORGANELLES -II**

**[12hrs]**

Mitochondria: morphology and functions. Golgi complex: structure & functions. Microbodies: structure, morphology and functions, peroxisomes and glyoxysomes

### **UNIT IV CELL DIVISION AND CELL CYCLE**

**[12 hrs]**

Nucleus – structure, nuclear core complex composition and biochemical function, chromosome structure -polytene and lambrush chromosome with example. Cell cycles– Phases of cell cycle, mitotic and meiotic division. Apoptosis and necrosis.

### **UNIT-V CYTOSKELETON & CELL SIGNALLING**

**[12hrs]**

Cytoskeleton - components and biological functions. Microtubules, Microfilaments and IF proteins: Distribution, chemical composition and functions. Cell-cell adhesion- functions of Cadherins, desmosomes, gap junction & tight junction. Cell signaling: GPCR with reference to cAMP as secondary messenger.



**TEXT BOOKS:**

1. Verma P.S and Agarwal P.K. 2002. "Cell biology, Genetics, Molecular biology, Evolution and Ecology". 24th edition, S. Chand & Company Ltd.New Delhi.
2. De Robertis EDP and De Robertis EMF.2003. "Cell and Molecular Biology", 8<sup>th</sup>edition, B.I. Waverly Pvt Ltd.New Delhi.

**REFERENCE BOOKS:**

1. Sheela A. Stanly.2008. "Cell biology for biotechnologist". I Edition, Narosa Publishing House Pvt-Ltd.
2. Prakash, Lohar S. 2007, "Cell and Molecular biology" I edition, MJP publishers, Chennai.
3. Darnell J, Lodish H, Baltimore D. 2005. "Molecular cell biology", England, W. H Freeman.
4. Gerald karp. Cell biology. 2001. 7<sup>th</sup> edition –International student version, wiley publications.
5. Lehninger, Nelson And Cox. 2007."Principles of Biochemistry".6th edUK, Macmillan Worth Publishers.

<b>I B.Sc (Biochemistry)</b>	<b>NUTRITIONAL BIOCHEMISTRY PRACTICAL</b>	<b>COURSE CODE: BCP101A</b>
<b>SEMESTER I</b>		<b>HRS/WK-3</b>
<b>Major Practical – 1</b>		<b>CREDIT- 3</b>

### **LEARNING OBJECTIVES**

The objectives of this course are to

- Impart hands-on training in the estimation of various constituents by titrimetric method
- Prepare Biochemical preparations
- Determine the ash content and extraction of lipid

### **COURSE OUTCOMES**

**CO1-** Estimate the important biochemical constituents in the food samples.

**CO2-** Prepare the macronutrients from the rich sources.

**CO3-** Determine the ash and moisture content of the food samples

**CO4-** Extract oil from its sources

### **TITRIMETRY**

**[20 Hrs]**

1. Estimation of ascorbic acid in a citrus fruit.
2. Estimation of calcium in milk.
3. Estimation of glucose by Benedict's method in honey.
4. Estimation of phosphorous (Plant source)

### **BIOCHEMICAL PREPARATIONS**

**[15 Hrs]**

Preparation of the following substances and its qualitative tests

5. Lecithin from egg yolk.
6. Starch from potato.
7. Casein and Lactalbumin from milk.

### **GROUP EXPERIMENT**

**[10 Hrs]**

8. Determination of ash content and moisture content in food sample
9. Extraction of lipid by Soxhlet's method.

### **TEXT BOOKS**

1. Laboratory manual in Biochemistry, J. Jayaraman, 2nd edition, NewAge International Publishers, 2011,
2. An Introduction to Practical Biochemistry, David T. Plummer, 3rd edition, Tata McGraw-

Hill Publishing Company Limited, 2001.

### **REFERENCE BOOKS**

1. Biochemical Methods, Sadasivam S and Manickam A, 4th edition, NewAge International Publishers, 2016
2. Essentials of Food and Nutrition, Vol. I & II, M.S. Swaminathan.
- 3 Bowman and Robert M. 2006. Present Knowledge in Nutrition. 9th edition, International Life Sciences Publishers.
4. Indrani TK. 2003. Nursing Manual of Nutrition and Therapeutic Diet, 1st edition Jaypee Brothers medical publishers.
5. Martha H. and Marie A. 2012. Biochemical, Physiological, and Molecular Aspects of Human Nutrition. 3rd edition. Chand Publishers.

### **WEB RESOURCES**

- 1.<https://www.elsevier.com/journals/clinical-biochemistry/0009-9120/guide-for-authors>
- 2.<http://rajswasthya.nic.in/RHSDP%20Training%20Modules/Lab.%20Tech/Biochemistry/Dr.%20Jagarti%20Jha/Techniques%20In%20Biochemistry%20Lab.pdf>
- 3.[https://dspace.cuni.cz/bitstream/handle/20.500.11956/111493/Clinical\\_biochemistrypdf.pdf?sequence=1&isAllowed=y](https://dspace.cuni.cz/bitstream/handle/20.500.11956/111493/Clinical_biochemistrypdf.pdf?sequence=1&isAllowed=y)
- 4.[https://dspace.cuni.cz/bitstream/handle/20.500.11956/111493/Clinical\\_biochemistrypdf.pdf?sequence=1&isAllowed=y](https://dspace.cuni.cz/bitstream/handle/20.500.11956/111493/Clinical_biochemistrypdf.pdf?sequence=1&isAllowed=y)

<b>I B.Sc</b>	<b>CELL BIOLOGY AND BIOMOLECULES PRACTICAL</b>	<b>COURSE CODE: BCP202</b>
<b>Biochemistry</b>		<b>HRS/WK-3</b>
<b>SEMESTER II</b>		<b>CREDIT- 2</b>
<b>Major Practical – 2</b>		

### **I - QUALITATIVE ANALYSIS**

1. Qualitative analysis of carbohydrates - Glucose, fructose, arabinose, maltose, lactose, galactose, dextrin, mannose, sucrose and starch
2. Qualitative analysis of amino acids - Tyrosine, tryptophan, arginine, Histidine, Proline and cysteine

### **II - CELL AND TISSUE STUDIES**

1. Visualization of animal and plant cell by methylene blue
2. Visualization of nuclear fraction by acetocarmine stain
3. Staining and visualization of mitochondria by Janus green stain
4. Identification of different stages of mitosis in onion root tip
5. Identification of different stages of meiosis in onion bulb

### **III SPOTTERS**

9. a) **Organelles:**Mitochondria,Chloroplast,Endoplasmicreticulum,  
b) **Mitosisstages**–Prophase,Anaphase,Metaphase,Telophase

### **Practical-I question pattern (60 marks)**

1. Qualitative analysis-20
2. Cell and tissue studies-20
3. Spotters-5
4. Viva - 5
- 4.Record-10

<b>I M.Sc Biochemistry</b>	<b>BASICS OF BIOCHEMISTRY</b>	<b>COURSE CODE:</b> <b>PBC11B</b>
<b>SEMESTER-I</b>		<b>HRS/WK-5</b>
<b>CORE-1</b>		<b>CREDIT-4</b>

**OBJECTIVES:**

1. Students will be introduced to the structure of biomolecules.
2. The significance of carbohydrates in biological processes will be understood.
3. The structure, properties and biological significance of lipids in the biological system will be studied
4. Students will learn about the concepts of protein structure and their significance in biological processes and creatively comprehend the role of membrane components with their biological significance.
5. Students will gain knowledge about the structures and functional roles of nucleic acids in the biological system

**COURSE OUTCOMES (CO's):**

**CO1:** Explain the chemical structure and functions of carbohydrates

**CO2:** Using the knowledge of lipid structure and function, explain how it plays a role in Signaling pathways

**CO3:** Describe the various levels of structural organization of proteins and the role of proteins in biological system

**CO4:** Apply the knowledge of proteins in cell-cell interactions

**CO5:** Applying the knowledge of nucleic acid sequencing in research and diagnosis.

<b>SEMESTER I</b>	<b>COURSE CODE : PBC11B</b>					<b>COURSE TITLE : Basics of Biochemistry</b>								<b>HOURS:4</b> <b>CREDITS:3</b>
<b>COURSE OUTCOMES</b>	<b>PROGRAMME OUTCOMES(POS)</b>					<b>PROGRAMME SPECIFIC OUTCOMES(PSOS)</b>								<b>MEAN SCORE OF CO'S</b>
	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PS O1</b>	<b>PS O2</b>	<b>PS O3</b>	<b>PS O4</b>	<b>PS O5</b>	<b>PS O6</b>	<b>PS O7</b>	<b>PS O8</b>	
<b>CO1</b>	5	4	3	4	4	4	4	3	4	4	5	4	5	<b>4.05</b>
<b>CO2</b>	4	5	3	4	5	4	4	3	4	4	4	5	3	<b>3.92</b>
<b>CO3</b>	4	4	5	4	5	5	4	3	4	4	3	3	4	<b>4.00</b>
<b>CO4</b>	3	4	4	5	4	5	3	3	3	5	5	3	3	<b>3.84</b>
<b>CO5</b>	4	3	3	4	4	5	5	4	5	4	4	4	4	<b>4.1</b>
<b>Mean Overall Score</b>													<b>3.9</b>	

**Result: The Score of this Course is 3.9 (High)**

<b>Association</b>	<b>1%-20%</b>	<b>21%-40%</b>	<b>41%-60%</b>	<b>61%-80%</b>	<b>81%-100%</b>
<b>Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Interval</b>	<b>0&lt;=rating&lt;=1</b>	<b>1.1&lt;=rating&lt;=2</b>	<b>2.1&lt;=rating&lt;=3</b>	<b>3.1&lt;=rating&lt;=4</b>	<b>4.1&lt;=rating&lt;=5</b>
<b>Rating</b>	<b>Very Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>High</b>	<b>Very High</b>

This Course is having **High** association with Programme Outcome and Programme Specific Outcome

**UNIT I:** Carbohydrates- Classification, structure (configurations and conformations, anomeric forms), function and properties of monosaccharides, mutarotation, Disaccharides and oligosaccharides with suitable examples . Polysaccharides - Homopolysaccharides (starch, glycogen, cellulose, inulin, dextrin, agar, pectin, dextran). Heteropolysaccharides - Glycosaminoglycans– source, structure, functions of hyaluronic acid, chondroitin sulphates, heparin, keratan sulphate,. Glycoproteins - proteoglycans. O- Linked and N-linked glycoproteins. Biological significance of glycan. Blood group polysaccharides. Bacterial cell wall (peptidoglycans, teichoic acid) and plant cell wall carbohydrates. **(12 Hrs)**

**UNITII:** Lipids – Classification of lipids, structure, properties and functions of fatty acids, triacylglycerols, phospholipids, glycolipids, sphingolipids and steroids – Biological importance. Eicosanoids- classification, structure and functions of prostaglandins, thromboxanes, leukotrienes. Lipoproteins – Classification ,structure, transport ( endogenous and exogenous Pathway ) and their biological significance. **(12 Hrs)**

**UNITIII:** Overview of Amino acids - classification, structure and properties of amino acids, Biological role.Non Protein aminoacids and their biological significance .Proteins – classification based on composition, structure and functions. Primary, secondary, super secondary (motifs) (Helix-turn –helix, helix-loop-helix, Beta-alpha-beta motif, Rosemann Rossmann fold , Greek key ),tertiary and quaternary structure of proteins. Structural characteristics of collagen and hemoglobin. Determination of amino acid sequence.Chemical synthesis of a peptide, Forces involved in stabilization of protein structure. Ramachandran plot. Folding of proteins. Molecular chaperons – Hsp 70 and Hsp 90 - biological role. **(12 Hrs)**

**UNITIV:** Membrane Proteins - Types and their significance. Cytoskeleton proteins - actin , tubulin , intermediate filaments . Biological role of cytoskeletal proteins. Membrane structure- fluid mosaic model. **(12 Hrs)**

**UNITV:** Nucleic acids – types and forms (A, B, C and Z) of DNA. Watson-Crick model- Primary, secondary and tertiary structures of DNA. Triple helix and quadruplex DNA. Mitochondrial and chloroplast DNA. DNA supercoiling (calculation of Writhe, linking and twist number). Determination of nucleic acid sequences by Maxam Gilbert and Sanger’s methods. Forces stabilizing nucleic acid structure. Properties of DNA and RNA. C-value, C-value paradox, Cot curve. Structure and role of nucleotides in cellular communications. Major and minor classes of RNA, their structure and biological functions. **(12 Hrs)**

### **TEXT BOOKS**

1. David L. Nelson and Michael M. Cox (2012) Lehninger Principles of Biochemistry (6th ed) W. H. Freeman.
2. Voet. D & Voet. J. G (2010) Biochemistry, (4th ed), John Wiley & Sons, Inc.

3. Metzler D.E(2003).Thechemicalreactionsoflivingcells(2nded),Academic Press.
4. ZubayG.L(1999)Biochemistry,(4thed),McGraw-Hill.
5. Lubert Stryer(2010)Biochemistry,(7thed),W.H.Freeman
6. Satyanarayan,U(2014)Biochemistry(4thed), ArunabhaSenBooks &Allied(P)Ltd,Kolkata.

### **Reference books**

### **Web resources**

1. [https://bio.libretexts.org/Bookshelves/Biochemistry/Book%3A\\_Biochemistry\\_Online\\_\(Jakubowski\)](https://bio.libretexts.org/Bookshelves/Biochemistry/Book%3A_Biochemistry_Online_(Jakubowski))
2. <https://www.thermofisher.com/in/en/home/life-science/protein-biology/protein-biology-learning-center/protein-biology-resource-library/pierce-protein-methods/protein-glycosylation.html>
3. <https://ocw.mit.edu/courses/biology/7-88j-protein-folding-and-human-disease-spring-2015/study-materials/>
4. <https://www.open.edu/openlearn/science-maths-technology/science/biology/nucleic-acids-and-chromatin/content-section-3.4.2>
5. <https://www.genome.gov/genetics-glossary/Cell-Membrane>
6. <https://nptel.ac.in/content/storage2/courses/102103012/pdf/mod3.pdf>

<b>I M.Sc Biochemistry</b>	<b>BIOCHEMICAL AND MOLECULAR BIOLOGY TECHNIQUES</b>	<b>COURSE CODE:</b>
<b>SEMESTER-I</b>		<b>PBC12B</b>
<b>CORE-2</b>		<b>HRS/WK-5</b>
		<b>CREDIT-4</b>

### OBJECTIVES

Biochemical techniques combine various inter-disciplinary methods in biological research and the course aims to provide students with the following objectives:

1. To understand the various techniques used in biochemical investigation and microscopy.
2. To explain chromatographic techniques and their applications
3. To explain electrophoretic techniques.
4. To comprehend the spectroscopic techniques and demonstrate their applications in biochemical investigations.
5. To acquire knowledge of radio labelling techniques and centrifugation.

### COURSE OUTCOMES (CO's):

**CO1.** Attain good knowledge in modern used in biochemical investigation and microscopy and apply the experimental protocols to plan and carry out simple investigations in biological research.

**CO2.** Demonstrate knowledge to implement the theoretical basis of chromatography in upcoming practical course work.

**CO3.** Demonstrate knowledge to implement the theoretical basis of electrophoretic techniques in research work.

**CO4.** Tackle more advanced and specialized spectroscopic techniques that are pertinent to research.

**CO5.** Tackle more advanced and specialized radioisotope and centrifugation techniques that are pertinent to research work.

SEMESTER I	COURSE CODE : PBC12B					COURSE TITLE :Biochemical and Molecular Biology Techniques								HOURS:4 CREDITS:3
COURSE OUTCOMES	PROGRAMME OUTCOMES(POS)					PROGRAMME SPECIFIC OUTCOMES(PSOS)								MEAN SCORE OF CO'S
	PO1	PO2	PO3	PO4	PO5	PS O1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	
CO1	5	4	3	5	4	4	4	3	4	4	5	4	5	4.15
CO2	4	5	3	4	5	4	4	3	4	4	4	5	3	3.92
CO3	4	4	5	4	5	5	4	4	4	4	3	3	4	4.07
CO4	3	4	4	5	4	5	3	3	3	5	5	3	3	3.84
CO5	4	3	3	4	4	5	5	4	5	4	4	5	4	4.15
	Mean Overall Score													4

**Result: The Score of this Course is 4.0 (High)**



Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	$0 \leq \text{rating} \leq 1$	$1.1 \leq \text{rating} \leq 2$	$2.1 \leq \text{rating} \leq 3$	$3.1 \leq \text{rating} \leq 4$	$4.1 \leq \text{rating} \leq 5$
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **High** association with Programme Outcome and Programme Specific Outcome

**UNIT I:** General approaches to biochemical investigation, cell culture techniques and microscopic techniques. Organ and tissue slice technique, cell distribution and homogenization techniques, cell sorting, and cell counting, tissue Culture techniques. Cryopreservation, Biosensors- principle and applications. Principle, working and applications of light microscope, dark field, phase contrast and fluorescent microscope. Electron microscope- Principle, instrumentation of TEM and SEM, Specimen preparation and applications-shadow casting, negative staining and freeze fracturing. **(12 Hrs)**

**UNIT II:** Basic principles of chromatography- adsorption and partition techniques. Chiral Chromatography and counter current Chromatography. Adsorption Chromatography – Hydroxy apatite chromatography and hydrophobic interaction Chromatography. Affinity chromatography. Gas liquid chromatography- principle, instrumentation, column development, detectors and applications. Low pressure column chromatography – principle, instrumentation, column packing, detection, quantitation and column efficiency, High pressure liquid chromatography- principle, instrumentation, delivery pump, sample injection unit, column packing, development, detection and application. Reverse HPLC, capillary electro chromatography and perfusion chromatography. **(12 Hrs)**

**UNIT III:** General principles of electrophoresis, supporting medium, factors affecting electrophoresis, Isoelectric focusing-principle, ampholyte, development of pH gradient and application. PAGE-gel casting-horizontal, vertical, slab gels, sample application, detection-staining using CBB, silver, fluorescent stains. SDS PAGE-principle and application in molecular weight determination principle of disc gel electrophoresis ,2D PAGE. Electrophoresis of nucleic acids-agarose gel electrophoresis of DNA, pulsed field gel electrophoresis- principle, apparatus, application. Electrophoresis of RNA, curve. Microchip electrophoresis and 2D electrophoresis, Capillary electrophoresis.**(12 Hrs)**

**UNIT IV:** Basic laws of light absorption- principle, instrumentation and applications of UV-Visible, IR, ESR, NMR, Mass spectroscopy, Turbidimetry and Nephelometry. Luminometry (Luciferase system, chemiluminescence). X - ray diffraction. Atomic absorption spectroscopy - principle and applications - Determination of trace elements. **(12 Hrs)**

**UNIT V:** Nature of radioactivity-detection and measurement of radioactivity, methods based upon ionisation (GM counter) and excitation (scintillation counter), autoradiography and

applications of radioactive isotopes, Biological hazards of radiation and safety measures in handling radioactive isotopes. Basic principles of Centrifugation. Preparative ultracentrifugation - Differential centrifugation, Density gradient centrifugation. Analytical ultracentrifugation - Molecular weight determination. (12 Hrs)

### **TEXT BOOKS**

1. Keith Wilson , John Walker (2010) Principles and Techniques of Biochemistry and Molecular Biology (7th ed) Cambridge University Press

2. David Sheehan (2009), Physical Biochemistry: Principles and Applications (2nd ed), Wiley-Blackwell

3. David M. Freifelder (1982) Physical Biochemistry: Applications to Biochemistry and Molecular Biology, W.H. Freeman

4. Rodney F. Boyer (2012), Biochemistry Laboratory: Modern Theory and techniques, (2nd ed), Prentice Hall

5. Kaloch Rajan (2011), Analytical techniques in Biochemistry and Molecular Biology, Springer

6. Segel I.H (1976) Biochemical Calculations (2nd ed), John Wiley and Sons

7. Robyt JF (2015) Biochemical techniques: Theory and Practice (1st ed), CBS Publishers & Distributors

### **Reference books**

Web resources

1. Principles and techniques of biochemistry and molecular biology:

2. [https://www.kau.edu.sa/Files/0017514/Subjects/principals%20and%20techniques%20of%20biochemistry%20and%20molecular%20biology%207th%20ed%](https://www.kau.edu.sa/Files/0017514/Subjects/principals%20and%20techniques%20of%20biochemistry%20and%20molecular%20biology%207th%20ed%20)

<b>I M.Sc Biochemistry</b>	<b>PHYSIOLOGY AND CELL BIOLOGY</b>	<b>COURSE CODE:</b>
<b>SEMESTER-I</b>		<b>PBC13B</b>
<b>CORE-3</b>		<b>HRS/WK-5</b>
		<b>CREDIT-4</b>

## OBJECTIVE

To understand the functions and activities of organs, tissues or cells and of physical and chemical phenomena involved in the human body

## COURSE OUTCOMES (CO's):

**CO1.** Specifically understand the biological and chemical processes within a human cell

**CO2.** Identify and prevent diseases

**CO3.** Understand defects in digestion, nutritional deficiencies and intolerances, and gastrointestinal pathologies

**CO4.** Identify general characteristics in individuals with imbalances of acid- base, fluid and electrolytes.

**CO5.** Process the mechanism: the transmission of biochemical information between cell membrane and nucleus.

<b>SEMESTER I</b>	<b>COURSE CODE : PBC13B</b>					<b>COURSE TITLE:PHYSIOLOGY AND CELL BIOLOGY</b>								<b>HOURS:4 CREDITS :3</b>
<b>COURSE OUTCOMES</b>	<b>PROGRAMME OUTCOMES(POS)</b>					<b>PROGRAMME SPECIFIC OUTCOMES(PSOS)</b>								<b>MEAN SCORE OF CO'S</b>
	<b>PO 1</b>	<b>PO2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>	<b>PSO6</b>	<b>PSO7</b>	<b>PS O8</b>	
<b>CO1</b>	3	5	2	2	2	4	4	4	3	2	4	4	4	3.3
<b>CO2</b>	3	4	2	3	2	5	4	5	5	3	3	4	3	3.2
<b>CO3</b>	4	3	3	2	3	4	4	4	3	3	4	3	4	3.2
<b>CO4</b>	5	4	2	2	2	3	5	5	3	2	3	4	4	3.4
<b>CO5</b>	4	5	2	3	3	5	5	5	5	2	4	4	4	3.4
<b>Mean overall score</b>													<b>3.3</b>	

**Result: The Score of this Course is 3.3 (High)**

<b>Association</b>	<b>1%-20%</b>	<b>21%-40%</b>	<b>41%-60%</b>	<b>61%-80%</b>	<b>81%-100%</b>
<b>Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Interval</b>	<b>0&lt;=rating&lt;=1</b>	<b>1.1&lt;=rating&lt;=2</b>	<b>2.1&lt;=rating&lt;=3</b>	<b>3.1&lt;=rating&lt;=4</b>	<b>4.1&lt;=rating&lt;=5</b>
<b>Rating</b>	<b>Very Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>High</b>	<b>Very High</b>

This Course is having **High** association with Programme Outcome and Programme Specific Outcome

**UNIT I:** Major classes of cell junctions- anchoring, tight and gap junctions. Major families of cell adhesion molecules (CAMs)- cadherins, integrins. Types of tissues. Epithelium- organisation and types. The basement membrane. Cell cycle- mitosis and meiosis, Cell cycle-phases and regulation. Cell death mechanisms- an overview-apoptosis, necrosis. **(12 Hrs)**

**UNIT II:** Digestive system- structure and functions of different components of digestive system, digestion and absorption of carbohydrates, lipids and proteins, role of bile salts in digestion and absorption, mechanism of HCl formation in stomach, role of various enzymes and hormones involved in digestive system. Composition of blood, lymph and CSF. Blood cells - WBC, RBC and energy metabolism of RBC, Blood clotting mechanism and blood groups- ABO and Rhesus system. **(12 Hrs)**

**UNIT III:** Respiratory system-Gaseous transport and acid-base homeostasis. Mechanism of the movement of O<sub>2</sub> and CO<sub>2</sub> through lungs, arterial and venous circulation. Bohr effect, oxygen and carbon dioxide binding haemoglobin. pH maintenance by cellular and intracellular proteins. Phosphate and bicarbonate buffers, Metabolic acidosis and alkalosis. Respiratory acidosis and alkalosis. Regulation of fluid and electrolyte balance. **(12 Hrs)**

**UNIT IV:** Sensory transduction, Nerve impulse transmission- nerve cells, synapses, reflex arc structure, resting membrane potential, Nernst equation, action potential, voltage gated ion-channels, impulse transmission, neurotransmission, neurotransmitter receptors, synaptosomes, synaptotagmin, rod and cone cells in the retina, changes in the visual cycle, photochemical reaction and regulation of rhodopsin, odour receptors, learning and memory. Chemistry of muscle contraction – actin and myosin filaments, theories involved in muscle contraction, mechanism of muscle contraction, energy sources for muscle contraction. **12 Hrs**

**UNIT V** Hormones – Classification, Biosynthesis, circulation in blood, modification and degradation. Mechanism of hormone action, Target cell concept. Hormones of Hypothalamus, pituitary, Pancreatic, thyroid & parathyroid, adrenal and gonadal hormones. Synthesis, secretion, physiological actions and feedback regulation of synthesis. **(12 Hrs)**

### **TEXT BOOKS**

1. Karp, G. (2010). Cell and Molecular Biology: Concepts and Experiments (6th ed). John Wiley & Sons. Inc.
2. Bruce Alberts and Dennis Bray (2013), Essential Cell Biology, (4<sup>th</sup> ed), Garland Science.
3. De Robertis, E.D.P. and De Robertis, E.M.F. (2010). Cell and Molecular Biology. (8<sup>th</sup> ed). Lippincott Williams and Wilkins, Philadelphia.

4. Cooper, G.M. and Hausman, R.E. (2009). The Cell: A Molecular Approach. (5<sup>th</sup> ed). Sunderland, Mass. Sinauer Associates, Inc.
5. Wayne M. Baker (2008) the World of the Cell. (7<sup>th</sup> ed). Pearson Benjamin Cummings Publishing, San Francisco. Cell Biology
6. John E. Hall (2010). Guyton and Hall Textbook of Medical Physiology (12<sup>th</sup> ed), Saunders
7. Harrison's Endocrinology by J. Larry Jameson Series: Harrison's Specialty, 19th Edition  
Publisher: McGraw-Hill, Year: 2016.

## **REFERENCE BOOKS**

### **Web resources**

- 1.<https://www.genome.gov/genetics-glossary/Cell-Cycle>
- 2.<https://my.clevelandclinic.org/health/diseases/16083-infertility-causes>
- 3.<https://www.webmd.com/heartburn-gerd/reflux-disease>
- 4.<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5760509/>
- 5.<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3249628/>

<b>I M.Sc Biochemistry</b>	<b>MICROBIOLOGY &amp; IMMUNOLOGY</b>	<b>COURSE CODE:</b> <b>EPBC14B</b>
<b>SEMESTER-I</b>		<b>HRS/WK-5</b>
<b>ELECTIVE PAPER I</b>		<b>CREDIT-3</b>

### OBJECTIVES

1. To understand the classification of microorganisms based on their structure, size and shape with an insight into the ancient scriptures about microbes.
2. Able to explain the role of microorganisms in environment and also to learn the culture conditions.
3. To recognize the possible contamination of foods by microorganisms, to learn about counteracting preservative measures and to know about probiotic nature of microorganisms.
4. To gain knowledge on pathogenic mediation by microorganisms and preventive measures as well.
5. To comprehend the features of antimicrobial agents, their mechanism of action along with the side effects and also to explore natural remedial measures against microbes.

### COURSE OUTCOMES (CO's):

**CO1.** To classify (by both ancient and modern modes) the different types of microorganisms and explain life cycle of the microbes

**CO2.** To recognize the microorganisms involved in decay of foods and will be able to apply various counteracting measures. The students also will be able to relate the role of certain beneficial microbes in day-to-day's food consumption.

**CO3.** To understand the common pathogenic bacterial and fungi that cause toxic effects and also will be able to employ curative measures.

**CO4.** To analyse various features of wide variety of antimicrobial agents along with their mode of action, in addition, being able to apprehend the valuable potentials of traditional and easily available herbs.

**CO5.** To apply knowledge gained in production of industrially important products as both pharmaceutical and nutraceutical.

SEMESTER I	COURSE CODE :EPBC14B					COURSE TITLE:MICROBIOLOGY & IMMUNOLOGY								HOURS:4 CREDITS :3
COURSE OUTCOMES	PROGRAMME OUTCOMES(POS)					PROGRAMME SPECIFIC OUTCOMES(PSOS)								MEAN SCORE OF CO'S
	PO 1	PO2	PO 3	PO 4	PO 5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	
CO1	3	5	2	2	2	4	4	4	3	2	4	4	4	3.3
CO2	3	4	2	3	2	5	4	5	5	3	3	4	3	3.2
CO3	4	3	3	2	3	4	4	4	3	3	4	3	4	3.2
CO4	5	4	2	2	2	3	5	5	3	2	3	4	4	3.4
CO5	4	5	2	3	3	5	5	5	5	2	4	4	4	3.4
Mean overall score													3.3	

**Result: The Score of this Course is 3.3 (High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **High** association with Programme Outcome and Programme Specific Outcome

**UNIT I:** Taxonomical classification - bacteria, viruses (DNA, RNA), algae, fungi and protozoa. Distribution and role of microorganisms in soil, water and air. Charaka's classification of microbes, lytic cycle and lysogeny. Types of culture media, isolation of pure culture, growth curve and the measurement of microbial growth. (12 Hrs)

**UNIT II:** Contamination and spoilage of foods – cereals, cereal products, fruits, vegetables, meat, fish, poultry, eggs, milk and milk products. General principles of traditional and modern methods of food preservation - Removal or inactivation of microorganisms, boiling, steaming, curing, pasteurization, cold processing, freeze drying, irradiation, vacuum packing, control of oxygen and enzymes. Microbes involved in preparation of fermented foods - cheese, yoghurt, curd, pickles, rice pan cake, appam, ragi porridge (கேழ்வரகு கூழ்) and bread. (12 Hrs)

**UNIT III:** Food poisoning- bacterial food poisoning, *Salmonella*, *Clostridium botulinum* (botulism), *Staphylococcus aureus*, fungal food poisoning – aflatoxin, food infection – *Clostridium*, *Staphylococcus* and *Salmonella*. Pathogenic microorganisms, *E. coli*, *Pseudomonas*, *Klebsilla*, *Streptococcus*, *Haemophilus*, & *Mycobacterium*, causes, control, prevention, cure and safety. Food microbiological screening- Real time PCR, ELISA, Aerobic and anaerobic Plate Count, dye reduction method, anaerobic lactic acid bacteria, anaerobic sporeformers, Hazard analysis critical control point (HACCP) (12 Hrs)

**UNIT IV:** Antimicrobial chemotherapy, General characteristics of antimicrobial agents. Mechanism of action – sulfonamides, sulphones and PAS. Penicillin, streptomycin- spectra of activity, mode of administration, mode of action, adverse effects and sensitivity test., Antiviral and antiretroviral agents, Antiviral RNA interference, natural intervention (Natural immune modulators routinely used in Indian medical philosophy). (12 Hrs)

**UNIT V:** Immune system- definition and properties. Cells of the immune system – neutrophils, eosinophils, basophils, mast cells, monocytes, macrophages, dendritic cells, natural killer cells, and lymphocytes (B cells and T cells). Lymphoid organs- Primary and Secondary; structure and functions. Antigens and Complement System: definition, properties- antigenicity and immunogenicity, antigenic determinants and haptens. Antigen - antibody interactions - molecular

mechanism of binding. Affinity, avidity, valency, cross reactivity and multivalent binding. Immunoglobulins & Immune Response: Structure, classes and distribution of antibodies. Antibody diversity. Immune system in health & disease, Transplantation immunology- graft rejection and HLA antigens. Immunological techniques, Flow cytometry and its application.

(12 Hrs)

### **TEXT BOOKS**

1. Michael J. Pelczar Jr. (2001) Microbiology (5th ed), McGraw Hill Education (India) Private Limited
2. Frazier WC, Westhoff DC, Vanitha NM (2010) Food Microbiology (5<sup>th</sup> ed), McGraw Hill Education (India) Private Limited
3. Willey J and Sherwood L (2011), Prescott's Microbiology (8<sup>th</sup> ed) McGraw Hill Education (India)
4. Ananthanarayanan, Paniker and Arti Kapil (2013) Textbook of Microbiology (9<sup>th</sup> ed) Orient Black Swan
5. Judy Owen, Jenni Punt Kuby (2013), Immunology (Kindt, Kuby Immunology) (7th ed) W. H. Freeman & Co
6. Brooks GF and Carroll KC (2013) Jawetz Melnick & Adelbergs Medical Microbiology, (26<sup>th</sup> ed) McGraw Hill Education
7. Greenwood D (2012), Medical Microbiology, Elsevier Health

### **Reference books**

#### **Web resources**

1. <https://www.ijam.co.in/index.php/ijam/article/view/1326> (Krumi (Microorganisms) in Ayurveda- a critical review)
2. Virtual Lectures in Microbiology and Immunology, University of Rochester
3. <https://www.frontiersin.org/articles/10.3389/fphar.2020.578970/full#h9>
4. <https://www.frontiersin.org/articles/10.3389/fmicb.2018.02151/full>
5. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7559905/>



<b>I M.Sc Biochemistry</b>	<b>ENERGY AND DRUG METABOLISM</b>	<b>COURSE CODE:</b> <b>EPBC15</b>
<b>SEMESTER-I</b>		<b>HRS/WK-5</b>
<b>ELECTIVE PAPER II</b>		<b>CREDIT-3</b>

### OBJECTIVES

- 1.Familiarize on concepts of enthalpy, entropy, free energy, redox system, biological oxidation and high energy compounds
- 2.Provide an insight into the relationship between electron flow and phosphorylation
- 3.Inculcate knowledge on processes involved in converting light energy to chemical energy and associated food production by autotrophs
- 4.Provide a platform to understand the versatile role of Krebs cycle, transport of NADH across mitochondrial membrane and energetics
- 5.Educate on the various phases xenobiotic metabolism

### COURSE OUTCOMES (CO's):

**CO1.** Appreciate the relationship between free energy and redox potential and will be able to justify the role of biological oxidation and energy rich compounds in maintaining the energy level of the system

**CO2.** Gain knowledge on role of mitochondria in the production of energy currency of the cell

**CO3.** Acquaint with the process of photosynthesis

**CO4.** Comprehend on the diverse role of TCA cycle and the energy obtained on complete oxidation of glucose and fatty acid

**CO5.** Correlate the avenues available to metabolize the bimolecules

SEMESTER I	COURSE CODE :EPBC15					COURSE TITLE:ENERGY & DRUG METABOLISM								HOURS:5 CREDITS :3
COURSE OUTCOMES	PROGRAMME OUTCOMES(POS)					PROGRAMME SPECIFIC OUTCOMES(PSOS)								MEAN SCORE OF CO'S
	PO 1	PO2	PO 3	PO 4	PO 5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	
CO1	3	5	2	2	2	4	4	4	3	2	4	4	4	3.3
CO2	3	4	2	3	2	5	4	5	5	3	3	4	3	3.2
CO3	4	3	3	2	3	4	4	4	3	3	4	3	4	3.2
CO4	5	4	2	2	2	3	5	5	3	2	3	4	4	3.4
CO5	4	5	2	3	3	5	5	5	5	2	4	4	4	3.4
<b>Mean overall score</b>													<b>3.3</b>	

**Result: The Score of this Course is 3.3 (High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **High** association with Programme Outcome and Programme Specific Outcome

**UNIT I:** Thermodynamic- principles in biology- Concept of entropy, enthalpy and free energy change. Redox systems. Redox potential and calculation of free energy. Biological oxidation – Oxidases, dehydrogenases, hydroperoxidases, oxygenases. Energy rich compounds – phosphorylated and non-phosphorylated. High energy linkages.(12 Hrs)

**UNIT II:** Electron transport chain-various complexes of ETC, Q-cycle. Inhibitors of ETC. Oxidative phosphorylation-P/O ratio, chemiosmotic theory. Mechanism of ATP synthesis - role of F<sub>0</sub>-F<sub>1</sub> ATPase, ATP-ADP cycle. Inhibitors of oxidative phosphorylation ionophores, protonophores .Regulation of oxidative phosphorylation(12 Hrs)

**UNIT III:** Light reaction-Hills reaction, absorption of light, photochemical event. Photo ETC-cyclic and non-cyclic electron flow. Photophosphorylation-role of CF<sub>0</sub>-CF<sub>1</sub> ATPase. Dark reaction- Calvin cycle, control of C<sub>3</sub> pathway, and Hatch-Slack pathway (C<sub>4</sub> pathway), Photorespiration. Synthesis and degradation of starch (12 Hrs)

**UNIT IV:** Interconversion of major food stuffs. Energy sources of brain, muscle, liver, kidney and adipose tissue. Amphibolic nature of Citric acid cycle. Anaplerotic reaction. Krebs cycle, Inhibitors and regulation of TCA cycle. Transport of extra mitochondrial NADH – Glycerophosphate shuttle, malate aspartate shuttle. Energetics of metabolic pathways – glycolysis, (aerobic and anaerobic) ,citric acid cycle, beta oxidation (12 Hrs)

**UNIT V:** Activation of sulphate ions – PAPS, APS, SAM and their biological role. Metabolism of xenobiotics – Phase I reactions – hydroxylation, oxidation and reduction. Phase II reactions – glucuronidation, sulphation, glutathione conjugation, acetylation and methylation. Mode of action and factors affecting the activities of xenobiotic enzymes. (12 Hrs)

## **TEXT BOOKS**

1. David L. Nelson and Michael M. Cox (2012) Lehninger Principles of Biochemistry (6th ed), W.H. Freeman
2. Robert K. Murray, Darryl K. Granner, Peter A. Mayes, and Victor W. Rodwell (2012), Harper's Illustrated Biochemistry, (29th ed), McGraw-Hill Medical
3. Metzler D.E (2003). The chemical reactions of living cells (2nd ed), Academic Press.
4. Zubay G.L (1999) Biochemistry , (4th ed), Mc Grew-Hill.
5. Devlin RM (1983) Plant Physiology (4th ed), PWS publishers
6. Taiz L , Zeiger E (2010), Plant Physiology (5th ed), Sinauer Associates, Inc

## **Reference books**

### **Web resources**

1. <https://chemed.chem.purdue.edu/genchem/topicreview/bp/ch21/gibbs.php>
2. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7767752/#:~:text=The%20mitochondrial%20electron%20transport%20chain,cellular%20ATP%20through%20oxidative%20phosphorylation.>
3. [https://www.researchgate.net/figure/Oxidative-phosphorylation-in-mitochondrial-electron-transport-chain-ETC-and-proton\\_fig1\\_230798915](https://www.researchgate.net/figure/Oxidative-phosphorylation-in-mitochondrial-electron-transport-chain-ETC-and-proton_fig1_230798915)
4. <https://www.lyndhurstschools.net/userfiles/84/Classes/851/photosynthesis%20light%20&%20dark%20reactions%20ppt.pdf?id=560837>
5. <https://bajan.files.wordpress.com/2010/05/amphibolic-nature-of-krebs-cycle.pdf>
6. <https://www.sciencedirect.com/topics/medicine-and-dentistry/xenobiotic-metabolism#:~:text=Xenobiotic%20metabolism%20can%20be%20defined,more%20readily%20excreted%20hydrophilic%20metabolites>

<b>I M.Sc (Biochemistry)</b>	<b>LABORATORY COURSE ON BIOMOLECULES AND BIOCHEMICAL TECHNIQUES</b>	<b>PBCP101B</b>
<b>SEMESTER - I</b>		<b>HRS/WK - 5</b>
<b>CORE COURSE III Practical -1</b>		<b>CREDIT – 4</b>

### **I - Biochemical studies and estimation of macromolecules**

1. Isolation and estimation of glycogen from liver.
2. Isolation and estimation of DNA from animal tissue.
3. Isolation and estimation of RNA from yeast.
4. Purification of Polysaccharides –Starch and assessment of its purity

### **II - UV absorption**

1. Denaturation of DNA and absorption studies at 260nm.
2. Denaturation of Protein and absorption studies at 280nm.

### **III - Colorimetric estimations**

1. Estimation of Pyruvate
2. Estimation of tryptophan.

### **IV - Estimation of minerals**

1. Estimation of calcium
2. Estimation of iron

### **V - Plant Biochemistry**

1. Qualitative analysis Phytochemical screening
2. Estimation of Flavonoids -Quantitative analysis

### **VI - Group Experiments**

1. Fractionation of sub-cellular organelles by differential centrifugation-Mitochondria and nucleus
2. Identification of the separated sub-cellular fractions using marker enzymes (any one)
3. Separation of identification of lipids by thin layer chromatography..
4. Separation of plant pigments from leaves by column chromatography
5. Identification of Sugars by Paper Chromatography
6. Identification of Amino acids by Paper Chromatography

### **Text Books**

1. David Plummer (2001) An Introduction to Practical Biochemistry (3rd ed) McGraw Hill Education (India) Private Ltd
2. Jayaraman, J (2011), laboratory Manual in Biochemistry, New age publishers
3. Varley H (2006) Practical Clinical Biochemistry (6th ed) , CBS Publishers
4. O. Debiyi and F. A. Sofowora, (1978) "Phytochemical screening of medical plants," Iloyidia, vol. 3, pp. 234–246,
5. Prof. Sarin A. Chavhan, Prof. Sushilkumar A. Shinde (2019) A Guide to Chromatography Techniques Edition:1
6. Analytical techniques in Biochemistry and Molecular Biology; Katoch, Rajan. Springer(2011)

### **Web References**

1. [https://www.researchgate.net/publication/313745155\\_Practical\\_Biochemistry\\_A\\_Student\\_Companion](https://www.researchgate.net/publication/313745155_Practical_Biochemistry_A_Student_Companion)
2. <https://doi.org/10.1186/s13020-018-0177-x>
3. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5368116/>
4. <https://www.life.illinois.edu/biochem/455/Lab%20exercises/2Photometry/spectrophotometry.pdf>
5. <https://ijpsr.com/bft-article/determination-of-total-flavonoid-and-phenol-content-in-mimusops-elengi-linn/?view=fulltext>
6. <https://skyfox.co/wp-content/uploads/2020/12/Practical-Manual-of-Biochemistry.pdf>

<b>I M.Sc</b>	<b>METABOLISM AND REGULATION</b>	<b>COURSE CODE:</b>
<b>Biochemistry</b>		<b>PBC23B</b>
<b>SEMESTER-II</b>		<b>HRS/WK-5</b>
<b>CORE-VI</b>		<b>CREDIT-4</b>

### OBJECTIVES

- ❖ To understand the biological oxidation, ETC, and Oxidative phosphorylation process performed in cellular work.
- ❖ To provide students with an understanding of key metabolic pathways of carbohydrates and its energy generation.
- ❖ To give insights to general reactions of Amino acids and metabolism of protein.
- ❖ To know the metabolic pathway of lipids and lipids storage disease.
- ❖ To gain skills to interpret how the pathways are regulated by various metabolic and hormonal changes.

### COURSE OUTCOMES (CO's):

**CO1:** To gain insights about the biological oxidation process, high energy compounds and key carbohydrate metabolic pathways such as glycolysis, TCA and ETC.

**CO2:** To understand the key metabolic steps involved in various pathways of carbohydrate metabolism.

**CO3:** To gain knowledge about the metabolic pathways of amino acid metabolism and its related inborn errors.

**CO4:** To gain knowledge about the metabolic pathways of lipid metabolism and its storage diseases.

**CO5:** Able to understand and interpret the metabolic pathways of nucleic acid metabolism and nucleotide coenzymes.

<b>SEMESTER II</b>	<b>COURSE CODE: PBC23B</b>					<b>METABOLISM AND REGULATION</b>								<b>HOURS:5</b> <b>CREDITS:4</b>
<b>COURSE OUTCOMES</b>	<b>PROGRAMME OUTCOMES(POS)</b>					<b>PROGRAMME SPECIFIC OUTCOMES(PSOS)</b>								<b>MEAN SCORE OF CO'S</b>
	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO5</b>	<b>PSO 1</b>	<b>PSO 2</b>	<b>PSO 3</b>	<b>PSO 4</b>	<b>PSO 5</b>	<b>PSO 6</b>	<b>PSO 7</b>	<b>PSO 8</b>	
<b>CO1</b>	4	3	4	3	4	5	4	4	3	4	4	3	4	<b>3.8</b>
<b>CO2</b>	3	3	3	4	4	4	4	4	3	4	3	4	3	<b>3.5</b>
<b>CO3</b>	4	4	4	5	3	4	4	3	3	4	4	4	3	<b>3.8</b>
<b>CO4</b>	3	4	5	4	4	3	3	4	4	3	3	4	4	<b>3.7</b>
<b>CO5</b>	3	4	3	4	3	3	4	5	4	3	4	4	4	<b>3.7</b>
<b>Mean overall score</b>													<b>3.7</b>	

**Result: The Score of this Course is 3.7 (High)**



## UNIT V      NUCLEIC ACID METABOLISM

[15 hrs]

Nucleotides – Biosynthesis of Purines (de nova and salvage) and biosynthesis of Pyrimidines - catabolism and regulation of purine and pyrimidine biosynthesis. Biosynthesis of  $\text{NAD}^+$  / $\text{NADP}^+$  and  $\text{FAD}^+$ .

### TEXT BOOKS:

1. Nelson, D.L. and Cox, M.M (2021). Lehninger Principles of Biochemistry. 8<sup>th</sup> Edition, W.H. Freeman and Company, New York.
2. U. Sathayanarayana (2006). Biochemistry. 3rd Edition by Books and Allied (P) Ltd., India.
3. Jain, J.L & Jain, (2005) Fundamentals of Biochemistry. Sixth Edition, S.Chand & Company, New Delhi.

### REFERENCE BOOKS:

1. Victor W. Rodwell, 2015. Harpers Illustrated Biochemistry 30th Edition Paper back – Import, 1 Jan
2. Berg, J. M., Tymoczko, J. L. and Stryer, L, 2011. Biochemistry. Freeman, 7th edn,
3. Zubay, G. (2017). Biochemistry, 5th Edition, WCB. Mcgraw-Hill, New York.
4. Donald Voet, Judith, G. Voet, and Charlotte, W Pratt, (2016). Fundamentals of Biochemistry, 5th Edition. John Wiley & Sons, New Jersey.



<b>II M.Sc Biochemistry</b>	<b>PLANT BIOCHEMISTRY</b>	<b>COURSE CODE : PBC32B</b>
<b>SEMESTER-III</b>		<b>HRS/WK-5</b>
<b>CORE: 8</b>		<b>CREDIT-4</b>

### OBJECTIVES

- ❖ To acquire knowledge of the chemistry of important biological processes in plants.
- ❖ To study about the functions and mechanisms of different plant hormones.
- ❖ To acquire knowledge about photosynthesis, metabolism of nitrogen compounds and about molecular mechanisms of signalization and regulation.
- ❖ To acquire knowledge about the importance of secondary metabolites and stress metabolism.
- ❖ To gain thorough knowledge about the nitrogen fixation mechanism

### COURSE OUTCOMES (CO)

**CO1:** Able to gain knowledge about the different components of plant cells apart from mechanism of absorption by plants.

**CO2:** To get in-depth knowledge about the functions and mechanisms of different plant hormones.

**CO3:** To acquire knowledge about the steps and mechanisms involved in photosynthesis of plants.

**CO4:** To know and interpret the different secondary metabolites present in the plants and its stress adaptation.

**CO5:** To gain thorough understanding about the nitrogen fixing mechanisms adopted by the soil microbes.

SEMESTER III	Course Code: PBC32B					PLANT BIOCHEMISTRY								HOURS:5 CREDITS:4
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(P SO)								MEAN SCORE OF CO'S
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	
CO1	4	4	3	5	4	3	4	3	4	5	4	3	4	3.8
CO2	5	3	4	4	3	4	5	4	3	4	5	4	3	3.9
CO3	4	4	3	3	4	5	3	4	3	4	5	3	4	3.8
CO4	5	3	3	4	3	3	5	3	4	3	4	4	3	3.6
CO5	4	4	3	4	4	5	4	4	4	3	4	3	4	3.8
<b>Mean overall score</b>													<b>3.8</b>	

**Result: The Score of this Course is 3.8 (High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcome and Programme Specific Outcome

### **UNIT I PLANT CELL & ABSORPTION [10 hrs]**

Discovery and definition of plant cell – cell wall, plasmadesmata, meristematic cells, and secretory systems. Mechanism of absorption .Ion exchange passive absorption. Active absorption .The carrier concept. Donnan’s equilibrium.

### **UNIT II PLANT HORMONES [10 hrs]**

Structure, biosynthesis, mode of action & physiological effects of auxins, giberellins, cytokinins and IAA. Biochemistry of seed dormancy, seed germination, fruit ripening and senescence.Synthetic seeds.

### **UNIT III PLANT PIGMENTS & PHOTOSYNTHESIS [20 hrs]**

Structure & synthesis of chlorophyll, phycobilins and carotenoids. Photosynthesis photosystem I & II- Light absorption, Hill reaction, Red drop & Emerson’s enhancement effect. Cyclic and non-cyclic photophosphorylation, Calvin cycle. Photosynthesis-factors and regulation. Chloroplast ATP synthase, complexes associated with thylakoid membranes, light harvesting complexes. C3, C4 pathway and CAM.

### **UNIT IV SECONDARY METABOLITES &STRESS METABOLISM [15 hrs]**

Secondary metabolites in plants –classification & function of alkaloids, terpenoids, tannins, polyphenols, flavanoids, saponins, lignin and pectin. Stress metabolism in plants - Environmental stresses, salinity, water stress, heat, Heavy metals, radiations ,chilling and their impact on plant growth.

### **UNIT V NITROGEN FIXING ORGANISMS [20hrs]**

Nitrogen fixation: Structure and mechanism of action of nitrogenase: Rhizobium symbiosis. Leghaemoglobin; strategies for protection of nitrogenase against the inhibitory effect of oxygen; nif genes of klebsiella pneumoniae including their regulation. Nitrate Assimilation: Nitrate reductase; regulation of nitrate assimilation. Ammonia assimilation by glutamine synthetase- glutamine oxoglutarate amino transferase (GS-GOGAT). Nitrite and nitrate reductase.

**TEXTBOOKS :**

- 1.Jain.V.K., 2005. Fundamentals of Plant Physiology, revised 1<sup>st</sup> edition S.Chand and Co.
- 2.Verma,2001. Plant physiology, 7th Revised edition, Emkay Publications.
- 3.S. N. Pandey and B.K. Sinha, 1999.Vikas Publishing House Pvt. Ltd, 3rd edition, Plant Physiology

**REFERENCE BOOKS:**

- 1.Solisbury and Ross,Plant Physiology,3rd edition,CBS Publishers and Distributors.
- 2.Hans-Walter Held,Plant Biochemistry, 3rd edition,Elsevier India Pvt.Ltd.
- 3.Bonner and Varner, Plant Biochemistry, 3rd edition,Academic Press.
- 4.Bowsher, C, Steer, M. and Tobin, A (2008). Plant Biochemistry. Garland Science,Taylor and Francis Group, LLC. New York.

<b>II M.Sc Biochemistry</b>	<b>ENDOCRINOLOGY</b>	<b>COURSE CODE: PBC33A</b>
<b>SEMESTER-III</b>		<b>HRS/WK-5</b>
<b>CORE-9</b>		<b>CREDIT-4</b>

### OBJECTIVES

- ❖ To provide students with a broad understanding of the major human endocrine glands and their hormones, together with understanding hormones action and their effect on target cells.
- ❖ To provide students with an understanding of the medical conditions resulted from abnormal hormone secretion and the laboratory tests that are used to diagnose these conditions

### COURSE OUTCOMES (CO's):

**CO1:**To gain the knowledge about the functions of pituitary, hypothalamus and pineal gland hormones and its regulations.

**CO2:**To learn and understand the structure and functions of thyroid, parathyroid hormones and its regulations.

**CO3:**To understand the structure and functions of gastrointestinal and pancreatic hormones.

**CO4:**To acquire the knowledge about the structure and functions of adrenal hormones and its regulation.

**CO5:**To gain the knowledge about the structure and functions of male and female sex hormones and its regulation.

SEMESTER III	SUB CODE: PBC33A					ENDOCRINOLOGY								HOURS:5 CREDITS:4
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)								MEAN SCORE OF CO'S
	PO 1	PO 2	PO 3	PO 4	PO5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	
CO1	4	4	3	4	4	4	4	3	5	4	5	3	4	3.9
CO2	3	3	4	4	3	3	4	3	4	4	5	2	4	3.5
CO3	4	4	5	3	3	4	3	4	3	4	3	4	3	3.6
CO4	4	5	4	3	3	3	4	3	4	4	4	3	4	3.7
CO5	3	4	4	3	3	5	4	4	4	3	4	3	3	3.6
Mean overall score													3.7	

**Result: The Score of this Course is 3.7 (High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This course is having **HIGH** association with programme outcome and programme specific outcome

### **UNIT I HYPOTHALAMIC, PITUITARY & PINEAL GLAND HORMONES [15 hrs]**

Definition & Classification - Mechanism of hormone action. Definition of signals, ligands and receptors, endocrine, paracrine and autocrine signalling. Pituitary Hormones: Anatomy of pituitary gland, hormones of the pituitary, Hypothalamic releasing factors, Anterior pituitary hormones: biological actions, regulation and disorders of growth hormones, ACTH, gonadotrophins prolactin and Leptin. Posterior pituitary hormones: vasopressin and Oxytocin - biological actions, regulation and disorders, MSH. Pineal gland - melatonin hypothesis, melatonin secretion and circulation, proposed role of pineal gland and mechanism of action. Hormonal action of Serotonin.

### **UNIT II THYROID & PARATHYROID HORMONES [15 hrs]**

Thyroid hormones – synthesis, secretion, regulation, transport, metabolic fate and biological actions. Antithyroid agents. Parathyroid hormone - Synthesis, Secretion and biological actions. Calcitonin and calcitriol - Hormonal regulation of calcium and phosphate metabolism. Hypercalcemia and hypocalcemia, Rickets and osteomalacia

### **UNIT III ADRENAL & GASTRO INTESTINAL HORMONES [15 hrs]**

Adrenal gland structure. Adrenal cortical hormones - Synthesis, regulation, transport, metabolism and biological effects. Cushing's syndrome, aldosteronism, congenital adrenal hyperplasia, adrenal cortical insufficiency. Adrenal medullary hormones – synthesis, secretion, metabolism, regulation and biological effects of catecholamines. Pheochromocytoma. G.I. Tract hormones – chemical nature & functions of Gastrin, Enterogastin, Secretin & Cholecystokinin. Adiponectin.

### **UNIT-IV PANCREATIC HORMONES [15 hrs]**

**Pancreatic hormones** – cell types of islets of Langerhans - synthesis, regulation, biological effects and mechanism of action of glucagon and insulin. Somatostatin, Pancreatic polypeptide and Ghrelin.

### **UNIT V SEX HORMONES [15 hrs]**

**Male sex hormones:** Biosynthesis, regulation, transport, metabolism and biological actions of androgens. Hypogonadism and gynecomastia.

**Female sex hormones:** Biosynthesis, regulation, transport, metabolism and biological effects of oestrogen and progesterone. The menstrual cycle. Amenorrhoea.

**TEXT BOOKS:**

1. Robert Murray, Bender, (2012) Harper's Illustrated Biochemistry.
2. Williams Textbook of Endocrinology – Wilson and Foster 8th ed.
3. Guyton, A.C. and Hall, J.E (2006), Textbook of Medical Physiology, 11th Edition, Saunders Co. Pennsylvania.

**REFERENCES:**

1. Principles of Biochemistry – Mammalian Biochemistry – Smith. McGraw Hill 7th ed
2. Nelson, D. L. & Cox, M. M, 2008. Lehninger Principles of Biochemistry. 5th edn, Freeman.
3. Wilson and Foster, 1992, Textbook of Endocrinology, (8th edn), W.B. Saunders, USA.
4. Mac. E. Hadley and Jon. E. Levin, 2009, Endocrinology 6th ed., Darling Kindersly Pvt. Ltd., India

<b>II M.Sc</b>	<b>BIOCHEMICAL TOXICOLOGY</b>	<b>COURSE CODE:</b>
<b>Biochemistry</b>		<b>PBC34A</b>
<b>SEMESTER-III</b>		<b>HRS/WK-5</b>
<b>ELECTIVE-3</b>		<b>CREDIT-4</b>

### OBJECTIVES

1. To understand the detailed study of biochemical basis of drugs and its toxicity, particularly their actions on living systems.
2. To understand the relevance and methods to identify the chemotherapeutic value of drug.
3. To understand the fundamentals of toxicology and dose- response relationships.
4. To understand the toxicological drug testing procedures based on in vitro and animal studies
5. To understand biochemical pathways of drug toxicity and its manifestation on vital organs.

### Course Outcomes (CO's)

**CO1:** To appreciate and understand the role of toxicological biomarkers to assess drug toxicities.

**CO2:** To conceive the role of disposition of drug in human system and their metabolism and methodologies pertaining to toxicological studies.

**CO3:** To understand and evaluate the functions of different organs on drug disposition and associated drug toxicities.

**CO4:** To understand the toxicological response to foreign compounds and their pharmacological, physiological and biochemical effects.

**CO5:** To link the mechanism of toxicity and clinical symptoms with underlying physiological disturbances.

SEMESTER III	COURSE CODE: PBC34A					BIOCHEMICAL TOXICOLOGY								HOURS:5 CREDITS :4
COURSE OUTCOMES	PROGRAMME OUTCOMES(POS)					PROGRAMME SPECIFIC OUTCOMES(PSOS)								MEAN SCORE OF CO'S
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	
CO1	5	4	4	3	4	3	4	4	3	4	3	5	4	3.8
CO2	4	4	3	4	3	3	4	4	4	5	5	4	4	3.9
CO3	4	3	4	3	4	3	4	5	4	3	3	3	4	3.6
CO4	3	4	4	3	3	4	3	4	4	4	3	4	3	3.5
CO5	4	3	3	4	3	4	3	4	4	3	4	4	3	3.6
<b>Mean overall score</b>													<b>3.7</b>	

**Result: The Score of this Course is 3.7 (High)**

Association	1% -20%	21% -40%	41% -60%	61% -80%	81% -100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

### **UNIT I Fundamentals of Toxicology and dose-Response Relationships [12 Hrs]**

Introduction Biomarkers Criteria of Toxicity New Technologies Evaluation of Toxicity Interactions; Dose Response; Measurement of Dose-Response; Relationships Linear Dose Response Hormesis; Hazard and Risk Assessment Duration and Frequency of Exposure and Effect.

### **UNIT II Factors Affecting Toxic Responses [12 Hrs]**

Disposition: Absorption, Sites of absorption, distribution, Excretion; Metabolism: types of Metabolic change phase I reactions; Phase 2 reactions; control of Metabolism, Toxication vs. Detoxication.

### **UNIT III Toxicity testing [12 Hrs]**

Test protocol, Genetic toxicity testing & Mutagenesis assay: In vitro test systems: bacterial mutation tests-Reversion test, Ames test, Fluctuation test, and Eukaryotic mutation test. In vivo test system Mammalian mutation test-Host mediated assay and Dominant Lethal test. Biochemical basis of toxicity: Mechanism of toxicity: Disturbance of excitable membrane function, Altered Calcium homeostasis, Covalent binding to cellular macromolecules & genotoxicity, Tissue specific toxicity.

### **UNIT IV Toxic Responses to Foreign Compounds [12 Hrs]**

Direct Toxic Action: Tissue Lesions; Mechanism and response in cellular toxicity, pharmacological, physiological and Biochemical effects; Developmental Toxicology-Teratogenesis; Immunotoxicity Genetic Toxicity; Chemical Carcinogenesis.

### **UNIT V Biochemical Mechanisms of Toxicity [12 Hrs]**

Tissue Lesions: Liver Necrosis; kidney Damage; Lung Damage, Liver damage, Cardiac damage; Neurotoxicity; Exaggerated and Unwanted pharmacological effects; Physiological effects; Biochemical Effects: Lethal Synthesis and Incorporation, Interaction with specific Protein Receptors; Teratogenesis; Immunotoxicity; multi-Organ Toxicity.

### **TEXT BOOKS**

1. Textbook of Drug Design. Krogsgaard-Larsen, Liljefors and Madsen (Editors), Taylor and Francis, London UK, 2002.
2. Drug Discovery Handbook S.C. Gad (Editor) Wiley-Interscience Hoboken USA, 2005
3. Pharmacology in Drug Discovery. T. P. Kenakin. Elsevier, 1st Edition 2012.

### **REFERENCE BOOKS**

1. Practical Application of Computer-Aided Drug Design, Ed. Charifson P., Marcel Dekker Inc.
2. 3D QSAR in Drug Design: Theory, Methods and Applications, Ed. Kubinyi H., Ledien
3. Pharmaceutical Profiling in Drug Discovery for Lead Selection, Borhardt RT, Kerns, EH, Lipinski CA, Thakker DR and Wang B, AAPS Press, 2004
4. Drug Discovery and Development; Technology in Transition. HP Rang. Elsevier Ltd 1st edition 2006.



<b>I M.Sc (Biochemistry)</b>	<b>LABORATORY COURSE ON ENZYMOLGY, MICROBIOLOGY &amp; NUTRITION</b>	<b>Course Code-PBC22B</b>
<b>SEMESTER – II</b>		<b>HRS / WEEK: 8</b>
<b>PRACTICAL – II</b>		<b>CREDITS: 6</b>

I. Preparation of buffers

II. Titration curve

### **III. Alkaline Phosphatase**

- a. Isolation of Alkaline Phosphatase from goat kidney.
- b. Purification of alkaline phosphatase
- c. Checking the purity using SDS-PAGE
- d. Determination of optimum pH and temperature of alkaline phosphatase.
- e. Determination of specific activity and Km of alkaline phosphatase.
- f. Effect of activators and inhibitors on the activity of alkaline phosphatase.

### **IV. Salivary amylase**

- a. Effect of pH on the activity of salivary amylase
- b. Effect of temperature on the activity of salivary amylase
- c. Effect of substrate concentration on the activity of salivary amylase
- d. Determination of specific activity of salivary amylase

### **V. Microbiology**

- a. Safety measures and Good Laboratory Practices in microbiology laboratory
- b. Sterilization, Culture and inoculum preparation
- c. Staining of bacteria – Gram Staining

### **VI. Group Experiments**

- a. Separation of proteins based on molecular weight by SDS PAGE
- b. Agarose gel electrophoresis of genomic DNA
- c. Separation of amino acid by thin layer chromatography

## **TEXT BOOKS**

1. Harold Varley, (1980). Practical Clinical Biochemistry, Volume I and II. 5th Edition. CBS Publishers. New Delhi.
2. Jayaraman, S. (2003). Laboratory Manual in Biochemistry. 2nd Edition .New Age International (P) Limited. New Delhi.
3. Sadasivam S and Manickam P. (2004) Biochemical Methods. 2nd Edition. New Age International (P) Limited. New Delhi.

## **REFERENCE BOOKS**

1. David, T. Plummer, (1988). An Introduction to Practical Biochemistry. 3rd Edition. Tata McGraw Hill Publishing Company Ltd. New Delhi.
2. Pattabiraman, T.N. (1998). Laboratory Manual in Biochemistry. 3rd Edition. All India Publishers and Distributors. Chennai.

<b>II B.Sc. CHEMISTRY</b>	<b>FOOD PROCESSING TECHNOLOGY</b> <b>(For those students admitted in the year 2020 – 21 and onwards)</b>	<b>NMEFT401</b>
<b>SEMESTER - IV</b>		<b>HRS/WK - 3</b>
<b>NME</b>		<b>CREDITS - 2</b>

**Objective:** To make the students understand food processing and preservation methods

**Course Outcomes:**

Upon successful completion of the course, the student:

**CO1:** Could understand the principles of food preservation and processing

**CO2:** Could obtain knowledge about preservation of food at various temperatures

**CO3:** Could acquire knowledge about food preservation by radiation

**CO4:** Could comprehend government regulations and policies on food control

**CO5:** Could gain knowledge about processed foods

SEMESTER : III	COURSE CODE: NMEFT401					TITLE OF THE PAPER: FOOD PROCESSING TECHNOLOGY			HOURS : 3	CREDITS : 2
	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)			MEAN SCORE OF COs	
COURSE OUTCOME S	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3		
CO1	4	3	4	4	3	4	3	3	3.50	
CO2	3	3	4	4	3	4	4	4	3.62	
CO3	4	4	3	4	3	4	4	3	3.62	
CO4	3	4	3	4	3	3	2	3	3.12	
CO5	3	4	4	4	3	4	4	4	3.75	
<b>Mean Overall Score</b>									<b>3.5</b>	

<b>Association</b>	<b>1%-20%</b>	<b>21%-40%</b>	<b>41%-60%</b>	<b>61%-80%</b>	<b>81%-100%</b>
<b>Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Interval</b>	<b>0&lt;=rating&lt;=1</b>	<b>1.1&lt;=rating&lt;=2</b>	<b>2.1&lt;=rating&lt;=3</b>	<b>3.1&lt;=rating&lt;=4</b>	<b>4.1&lt;=rating&lt;=5</b>
<b>Rating</b>	<b>Very Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>High</b>	<b>Very High</b>

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

**Unit-1**

**(9 Hrs)**

Principles of preservation and processing of foods; classification of foods by ease of spoilage; principles of food preservation, methods of food preservation – asepsis, removal of microorganisms, maintenance of anaerobic conditions.

**Unit-2**

**(9 Hrs)**

Preservation of food by use of high and low temperature - Factors affecting heat resistance (Thermal death time); heat penetration, heat treatments employed in processing foods, canned foods; low temperature storage, chilling and freezing, freezing of foods and its consequences.

**Unit-3**

**(9 Hrs)**

Preservation of foods by drying - Methods of drying, treatments of foods before drying, procedures after drying, intermediate moisture foods; Preservation of foods by additives - antimicrobial preservatives, added preservatives, developed preservatives; Preservation of foods by radiation - Ultra violet radiation, ionizing radiations, gamma rays and cathode rays; microwave processing.

**Unit-4**

**(9 Hrs)**

Food Adulteration; Food sanitation - Microbiology of the food product, good manufacturing practices, Hazard Analysis Critical Control Points, health of employees; Food control – enforcement and control agencies – international agencies (FAO, WHO, FDA & ISO); national agencies (Agmark, ISI, BIS).

**Unit-5**

**(9 Hrs)**

Processed foods – Jam, canned fruit juices, pickles, Bread, Seafoods, Dairy products - Market milk, Special milk, Cream, Butter, Ice Cream, Cheese, Dried milk products; Packaging of milk and milk products.

**Text Book:**

- Food Microbiology. 5<sup>th</sup> Edition, 2013. William C. Frazier, Dennis C. Westhoff, N. M. Vanitha. McGraw-Hill Education (India).
- Food Microbiology, 4<sup>th</sup> Edition, 2015. Adams, M.R., Moss, M.O and McClure, P. J. RSC Publication, CPI Group (UK) Ltd., Croydon, UK.

**Reference Books:**

- Outlines of Dairy Technology. 1991. Sukumar De. Oxford University Press.
- A First Course in Food Analysis. 1999. A.Y. Sathe. New Age International (P) Limited, Publishers, New Delhi.
- The Microbiological Safety and Quality of Food. 2000. Barbara M. Lund, Baird-Parker, Gould G.W. An Aspen publication, Maryland, U.S.A.

<b>YEAR - I</b>	<b>FORENSIC SCIENCE</b> (For those students admitted in the year 2023 – 24 and onwards)	<b>EPMB13A</b>
<b>SEMESTER - I</b>		<b>HRS/WK - 5</b>
<b>CORE - II</b>		<b>CREDITS - 3</b>

### Course Objectives

**CO1:** Understand the Scope, need and learn the tools and techniques in forensic science.

**CO2:** Comprehend organizational setup of a forensic science laboratory

**CO3:** Identify and Examine body fluids for identification.

**CO4:** Extract DNA from blood samples for investigation

**CO5:** Recognize medico legal post mortem procedures and their importance.

SEMESTER: I	COURSE CODE: EPMB13A				COURSE TITLE: FORENSIC SCIENCE				HOURS: 5	CREDITS: 3
COURSE OUTCOMES	PROGRAMME OUTCOMES (PO)				PROGRAMME SPECIFIC OUTCOMES (PSO)				MEAN SCORE OF COs	
	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4		
CO1	3.5	3	4	5	4	4	4	5	4.6	
CO2	3	3	3.5	3.5	3	3	4	4.5	3.4	
CO3	2	3	3	4	4	3	4.5	5	3.5	
CO4	4	2	3	3.5	4	3.5	3.5	4	3.4	
CO5	3	2.5	3.5	4	4	3.5	4	4.5	3.6	
<b>Mean Overall Score</b>									<b>3.7</b>	

**Result:** The score of this course is 3.7 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

### Unit 1

(15 hrs)

Forensic Science - Definition, history and development of forensic science. Scope and need of forensic science in present scenario. Branches of forensic science. Tools and techniques of forensic science. Duties of a forensic scientist.

### Unit 2

(15 hrs)

Forensic science laboratories - Organizational setup of a forensic science laboratory. Central and State level laboratories in India. Mobile forensic science laboratory and its functions. Forensic microbiology - Types and identification of microbial organisms of forensic significance.

**Unit 3****(15 hrs)**

Forensic serology - Definition, identification and examination of body fluids - Blood, semen, saliva, sweat and urine. Forensic examination and identification of hair and fibre.

**Unit 4****(15 hrs)**

DNA profiling - Introduction, history of DNA typing. Extraction of DNA from blood samples - Organic and Inorganic extraction methods. DNA fingerprinting - RFLP, PCR, STR. DNA testing in disputed paternity.

**Unit 5****(15 hrs)**

Forensic toxicology - Introduction and concept of forensic toxicology. Medico legal post mortem and their examination. Poisons - Types of poisons and their mode of action

**Text Books**

- Nanda B.B. and Tewari R.K. (2001) Forensic Science in India: A Vision for the Twenty First Century. Select Publishers, New Delhi. ISBN- 10:8190113526 / ISBN-13:9788190113526.
- James S.H. and Nordby,J.J. (2015) Forensic Science: An Introduction to Scientific and Investigative Techniques. (5<sup>th</sup>Edition). CRC Press. ISBN-10:9781439853832 / ISBN- 13:978-1439853832.
- Li R. (2015) Forensic Biology. (2<sup>nd</sup> Edition). CRC Press, New York. ISBN-13:978-1-4398- 8972-5.
- Sharma B.R (2020) Forensic science in criminal investigation and trials. (6<sup>th</sup> Edition) Universal Press.
- Richard Saferstein (2017). Criminalistics- An introduction to Forensic Science. (12<sup>th</sup> Edition). Pearson Press.

**Reference books**

- Nordby J. J. (2000). Dead Reckoning.The Art of Forensic Detection- CRC Press, New York. ISBN:0-8493-8122-3.
- Saferstein R. and Hall A.B.(2020). Forensic Science Hand book, Vol.I, (3<sup>rd</sup> Edition). CRC Press, New York. ISBN-10:1498720196.
- Lincoln, P.J. and Thomson, J. (1998). (2<sup>nd</sup>Edition). Forensic DNA Profiling Protocols. Vol. 98. Humana Press. ISBN:978-0-89603-443-3.
- Val McDermid (2014). Forensics. (2<sup>nd</sup> Edition). ISBN 9780802125156.
- Vincent J. DiMaio., Dominick DiMaio. (2001). Forensic Pathology (2<sup>nd</sup> Edition).CRC Press

<b>YEAR – I</b>	<b>BIOINSTRUMENTATION</b> (For those students admitted in the year 2023 – 24 and onwards)	<b>EPMB14A</b>
<b>SEMESTER - I</b>		<b>HRS / WK – 5</b>
<b>ELECTIVE –II</b>		<b>CREDIT - 3</b>

**Objective:** To make the students familiar with basics and advanced techniques routinely used in biosciences.

**Course Outcomes:**

Upon successful completion of the course, the student:

**CO1:** Explain the principles and working mechanisms of laboratory instruments.

**CO2:** Discuss chromatography techniques and molecular biology techniques.

**CO3:** Illustrate molecular techniques in biological applications.

**CO4:** Acquire knowledge on spectroscopic techniques

**CO5:** Demonstrate the use of radio isotopes in various techniques.

SEMESTER: I	COURSE CODE: EPMB14A				COURSE TITLE: BIOINSTRUMENTATION				HOURS: 5	CREDITS: 3
COURSE OUTCOMES	PROGRAMME OUTCOMES (PO)				PROGRAMME SPECIFIC OUTCOMES (PSO)				MEAN SCORE OF COs	
	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4		
CO1	3	4	3	4	3	3	3	4	3.3	
CO2	3	3	3	4	3	4	3	4	3.2	
CO3	3	3	3	4	3	3	4	5	3.5	
CO4	3	3	3	3	3	3	4	5	3.3	
CO5	3	4	4	3	4	3	3	5	3.6	
<b>Mean Overall Score</b>									<b>3.4</b>	

**Result:** The score of this course is 3.4 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

**Unit - 1****(15 Hrs)**

Basic laboratory Instruments. Aerobic and anaerobic incubator – Biosafety Cabinets - Fume Hood, pH meter, Lyophilizer, Flow cytometry. Centrifugation techniques: Basic principles of centrifugation - Standard sedimentation coefficient - measurement of sedimentation coefficient; Principles, methodology and applications of differential, rate zonal and density gradient centrifugation - Applications in determination of molecular weight..

**Unit - 2****(15 Hrs)**

General principles of chromatography - Chromatographic Performance parameters; Types- Thin layer chromatography, Paper Chromatography, Liquid chromatography (LPLC &HPLC), Adsorption, ion exchange, Gel filtration, affinity, Gas liquid (GLC). Flash Chromatography and Ultra Performance convergence chromatography. Two dimensional chromatography. Stimulated moving bed chromatography (SEC).

**Unit - 3****(15 Hrs)**

Electrophoresis: Principle and applications - paper electrophoresis, Serum electrophoresis, starch gel electrophoresis, Disc gel, Agarose gel, SDS – PAGE, Immuno electrophoresis. Blotting techniques -Southern, northern and western blotting.

**Unit - 4****(15 Hrs)**

Spectroscopic techniques: Principle, simple theory of absorption of light by molecules, electromagnetic spectrum, instrumentation and application of UV- visible, FTIR spectrophotometer, Atomic Absorption Spectrophotometer, Flame spectrophotometer, NMR, ESR, Emission Flame Photometry and GC-MS. Detection of molecules in living cells - FISH and GISH. Biophysical methods: Analysis of biomolecules by Spectroscopy UV/visible.

**Unit - 5****(15 Hrs)**

Radioisotopic techniques: Principle and applications of tracer techniques in biology. Radioactive isotopes - radioactive decay; Detection and measurement of radioactivity using ionization chamber, proportional chamber, Geiger- Muller and Scintillation counters, auto radiography and its applications. Commonly used isotopes in biology, labeling procedures and safety aspects.

**Text Book**

- Sharma B. K. (2014). Instrumental Method of Chemical Analysis. Krishna Prakashan Media (P) Ltd.
- Chatwal G. R and Anand S.K. (2014.) Instrumental Methods of Chemical Analysis. Himalaya Publishing House.



- Mitchell G.H. (2017). Gel Electrophoresis: Types, Applications and Research. Nova Science Publishers Inc.
- Holme D. Peck H. (1998). Analytical Biochemistry. (3<sup>rd</sup> Edition). Prentice Hall.
- Jayaraman J. (2011). Laboratory Manual in Biochemistry. (2<sup>nd</sup> Edition). Wiley Eastn Ltd., New Delhi.

### **Reference Books**

- Pavia D. L. (2012) Spectroscopy (4<sup>th</sup> Edition). Cengage.
- Skoog A. and West M. (2014). Principles of Instrumental Analysis. (14<sup>th</sup> Edition). W.B.Saunders Co., Philadephia.
- Miller J. M. (2007). Chromatography: Concepts and Contrasts (2<sup>nd</sup> Edition) Wiley-Blackwell.
- Gurumani N. (2006). Research Methodology for Biological Sciences. (1<sup>st</sup> Edition) MJP Publishers.

<b>YEAR – I</b>	<b>BASICS IN MICROBIOLOGY</b> (For the students who are admitted in the year 2023 – 2026 and onwards)	<b>FMB101</b>
<b>SEMESTER - I</b>		<b>HRS/WK – 2</b>
<b>FOUNDATION COURSE</b>		<b>CREDITS - 2</b>

**Objective:** To make the students familiar with the basics of microbiology and microorganisms

**Course Outcomes:**

Upon successful completion of the course, the student:

**CO 1:** Will be able to know the economic importance of bacteria

**CO 2:** Will be able to gain knowledge on beneficial and harmful aspects of fungi

**CO 3:** Will be able to explore the role of algae in various sectors

**CO 4:** Will be able to acquire basic insight on significance of viruses.

**CO 5:** Will be able to know the importance of protozoa in day-to-day life

<b>SEMESTER</b> : <b>I</b>	<b>COURSE CODE:</b> <b>FMB101</b>					<b>COURSE TITLE:</b> <b>BASICS IN</b> <b>MICROBIOLOGY</b>			<b>HOURS</b> : <b>2</b>	<b>CREDITS</b> : <b>2</b>
<b>COURSE OUTCOMES</b>	<b>PROGRAMME OUTCOMES (PO)</b>					<b>PROGRAMME SPECIFIC OUTCOMES (PSO)</b>			<b>MEAN SCORE OF COs</b>	
	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PSO 1</b>	<b>PSO 2</b>	<b>PSO 3</b>		
<b>CO1</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>3.12</b>	
<b>CO2</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>3.25</b>	
<b>CO3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>4</b>	<b>4</b>	<b>3.00</b>	
<b>CO4</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>3.25</b>	
<b>CO5</b>	<b>4</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>3.37</b>	
<b>Mean Overall Score</b>									<b>3.19</b>	

**Result:** The score of this course is 3.19 (High)

<b>Association</b>	<b>1%-20%</b>	<b>21%-40%</b>	<b>41%-60%</b>	<b>61%-80%</b>	<b>81%-100%</b>
<b>Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Interval</b>	<b>0&lt;=rating&lt;=1</b>	<b>1.1&lt;=rating&lt;=2</b>	<b>2.1&lt;=rating&lt;=3</b>	<b>3.1&lt;=rating&lt;=4</b>	<b>4.1&lt;=rating&lt;=5</b>
<b>Rating</b>	<b>Very Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>High</b>	<b>Very High</b>

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

**Unit – 1** (6 Hrs)

**General features and economic importance of bacteria-** General characteristics and morphology of bacteria, mycoplasma, and archaebacteria. Economic importance of bacteria with examples in antibiotic production (*Streptomyces*), biofertilizer (*Rhizobium*), superbugs (*Pseudomonas*), fermentation (*Lactobacillus*). Harmful aspects such as food spoilage (*Clostridium*) and diseases (*Xanthomonas*, *Salmonella*, *Vibrio*).

**Unit – 2** (6 Hrs)

**General features and economic importance of fungi -** General characteristics and morphology of fungi, Economic importance of fungi with examples in biopesticide (*Beauveria*), industry (*Saccharomyces*), medicine (*Penicillium*). Harmful aspects - food spoilage (mold), diseases in crops (*Fusarium*), humans (*Aspergillus*), allergic reactions (*Mucor*).

**Unit – 3** (6 Hrs)

**General features and economic importance of algae-** General characteristics and morphology of algae. Beneficial aspects of algae with examples in single cell protein (*Spirulina*), soil fertility (*Anabaena*), environment (Phytoplanktons). Harmful aspects - Eutrophication and phycotoxins.

**Unit – 4** (6 Hrs)

**General features and economic importance of virus-**General characteristics of virus. Economic importance of virus with examples in vaccine production (Rabies virus), gene therapy (Adenovirus), biopesticides (Cauliflower mosaic virus). Harmful aspects - diseases (plant-TMV, human-Influenza virus).

**Unit – 5** (6 Hrs)

**General features and economic importance of protozoa-** General characteristics of protozoa. Beneficial applications of protozoa with examples – Biocontrol (*Haemogregarina*), sanitation (*Amoeba*), oil exploration (*Radiolaria*). Harmful aspects – diseases (*Entamoeba*, *Giardia*).

**Text Book**

\* Pelczar, M.J., Chan, E. C. S. and Kreig, N. R. (2006). Microbiology. 5<sup>th</sup> edition, Tata Mc Grow Hill Inc, New York.

\* Dubey, R.C. and Maheswari, D.K. (2005). A Text book of Microbiology. S.Chand&Company Ltd, New Delhi.

\* Subba Rao, N.S. (1995). Soil microorganisms and plant growth, Oxford and IBH publishing Co. Pvt. Ltd. New Delhi.

## **Reference Books**

\* Hurst, C.J., Crawford, R.L., Garland, J.L., Lipson, D.A. and Mills, A.L. (2002). Manual of Environmental Microbiology, 2nd Edition. A. SM Press, New Delhi.

\* Atlas, R.A. (1995) Principles of Microbiology. Mosby Publications, USA.

\* Madigan, M.T. and Martinko, J.M. (2014). Brock Biology of Microorganisms. 14<sup>th</sup> Edition. Prentice Hall International Inc., USA

## **Web Resources**

- <https://microbiologyinfo.com/category/basic-microbiology/>
- <https://microbiologyinfo.com/category/basic-microbiology/>
- <https://www.britannica.com/science/microbiology>

<b>YEAR – I</b>	<b>FUNDAMENTALS OF MICROBIOLOGY AND MICROBIAL DIVERSITY</b> <b>(For the students who are admitted in the year 2023 – 2026 and onwards)</b>	<b>MB101A</b>
<b>SEMESTER - I</b>		<b>HRS/WK – 4</b>
<b>CORE - 1</b>		<b>CREDITS - 4</b>

**Objective:** To make the students understand the basic principles in Microbiology.

**Course Outcomes:**

Upon successful completion of the course, the student:

**CO 1:** Learn the fundamental principles about different aspects of Microbiology including recent developments in the area.

**CO 2 :** Describe the structural organization, morphology and reproduction of microbes

**CO 3 :** Explain the methods of cultivation of microbes and measurement of growth.

**CO4 :** Understand the microscopy and other basic laboratory techniques—culturing, disinfection and sterilization in Microbiology.

**CO 5 :** Compare and contrast the different methods of sterilization.

<b>SEMESTER : I</b>	<b>COURSE CODE: MB101A</b>					<b>COURSE TITLE: FUNDAMENTALS OF MICROBIOLOGY AND MICROBIAL DIVERISTY</b>			<b>HOURS : 4</b>	<b>CREDITS : 4</b>
	<b>PROGRAMME OUTCOMES (PO)</b>					<b>PROGRAMME SPECIFIC OUTCOMES (PSO)</b>			<b>MEAN SCORE OF Cos</b>	
<b>COURSE OUTCOME S</b>	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PSO 1</b>	<b>PSO 2</b>	<b>PSO 3</b>		
<b>CO1</b>	3	5	4	2	2	5	3	3	<b>3.2</b>	
<b>CO2</b>	2	5	3	4	3	4	5	4	<b>3.7</b>	
<b>CO3</b>	2	4	4	4	3	4	5	5	<b>3.7</b>	
<b>CO4</b>	3	5	4	4	4	4	5	5	<b>4.2</b>	
<b>CO5</b>	3	5	4	5	5	4	5	5	<b>4.5</b>	
<b>Mean Overall Score</b>									<b>3.8</b>	

**Result:** The score of this course is 3.8 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	$0 \leq \text{rating} < 1$	$1.1 \leq \text{rating} \leq 2$	$2.1 \leq \text{rating} \leq 3$	$3.1 \leq \text{rating} < 4$	$4.1 \leq \text{rating} \leq 5$
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

### Unit – 1

(12Hrs)

History and Evolution of Microbiology, Classification – Three kingdom, five kingdom, six kingdom and eight kingdom. Microbial biodiversity: Introduction to microbial biodiversity-ecological niche. Basic concepts of Eubacteria, Archaeobacteria and Eucarya. Conservation of Biodiversity.

### Unit – 2

(12 Hrs)

General characteristics of cellular microorganisms (Bacteria, Algae, Fungi and Protozoa) and acellular microorganisms - (Viruses, Viroids, Prions), Differences between prokaryotic and eukaryotic microorganisms. Structure of Bacterial cell wall, cell membrane, capsule, flagella, pili, mesosomes, chlorosomes, phycobilisomes, spores, and gas vesicles. Structure of fungi (Mold and Yeast), Structure of microalgae.

### Unit – 3

(12Hrs)

Bacterial culture media and pure culture techniques. Mode of cell division, Quantitative measurement of growth. Anaerobic culture techniques.

### Unit – 4

(12Hrs)

Microscopy–Simple, bright field, dark field, phase contrast, fluorescent, electron microscope TEM & SEM, Confocal microscopy, and Atomic Force Microscopy Stains and staining methods

### Unit – 5 (12Hrs)

Sterilization–moist heat-autoclaving, dry heat–Hot air oven, radiation – UV, Ionization, filtration – membrane filter and disinfection, antiseptic; Antimicrobial agents.

### **Text Book**

- Pelczar.M.J., Chan E.C.S. and Noel. R.K. (2007). Microbiology.7<sup>th</sup>Edition., McGraw–Hill, NewYork.
- WilleyJ., Sherwood L., and Woolverton C.J., (2017). Prescott’s Microbiology.10<sup>th</sup> Edition., McGraw-Hill International edition.
- Tortora, G.J., Funke,B.R., Case,C.L. (2013). Microbiology. An Introduction11<sup>th</sup> Edition., A LaCarte Pearson.

### **Reference Books**

- Jeffrey C. Pommerville., Alcamo’s Fundamentals of Microbiology (9<sup>th</sup>Edition). Jones& Bartlett learning. 2010.
- Stanier R. Y, Ingraham J. L., Wheelis M. L., and Painter R. R. (2010). General Microbiology, 5<sup>th</sup>Edition., MacMillan Press Ltd.
- Tortora, G. J., Funke, B. R. and, Case, C. L (2013). Microbiology - An Introduction, 11<sup>th</sup> Edition., Benjamin Cummings.
- Nester E., Anderson D., Roberts C. E., and Nester M. (2006). Microbiology - A Human Perspective, 5<sup>th</sup>Edition., McGraw Hill Publications
- Madigan M. T., Martinko J. M., Stahl D. A, and Clark D.P. (2010). Brock - Biology ofMicroorganisms, 13<sup>th</sup> Edition Benjamin-Cummings PubCo.

### **Web Resources**

- <https://www.cliffsnotes.com/study-guides/biology/microbiology/introduction-to-microbiology/a-brief-history-of-microbiology>
- <https://www.keyence.com/ss/products/microscope/bz-x/study/principle/structure.jsp>
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6604941/#>
- <https://bio.libretexts.org/@go/page/9188>
- <https://courses.lumenlearning.com/boundless-microbiology/chapter/microbial-nutrition/>

<b>YEAR – I</b>	<b>PRACTICAL -I – FUNDAMENTAL S OF MICROBIOLOGY AND MICROBIAL DIVERSITY (For the students who are admitted in the year 2023 – 2026 and onwards)</b>	<b>MBP101A</b>
<b>SEMESTER - I</b>		<b>HRS/WK – 4</b>
<b>CORE PRACTICAL – 1</b>		<b>CREDITS - 4</b>

### List of Experiments

1. Cleaning of glasswares, Microbiological good laboratory practice and safety. Sterilization and assessment of sterility–Autoclave, hot air oven, and membrane filtration.
2. Media preparation: liquid media, solid media, semi-solid media, agar slants, agar deeps, agar plates. Preparation of basal, differential, enriched, enrichment, transport, and selective media preparation-quality control of media, growth supporting properties, sterility check of media.
3. Pure culture techniques: streak plate, pour plate, decimal dilution.
4. Culture characteristics of microorganisms: growth on different media, growth characteristics, and description. Demonstration of pigment production
5. Microscopy: light microscopy and bright field microscopy.
6. Staining techniques: smear preparation, simple staining, Gram’s staining and endospore staining.
7. Study on Microbial Diversity using Hay Infusion Broth
8. Wet mount to show different types of microbes, hanging drop.

### Text Books

- James G Cappucino and N. Sherman MB (1996). A lab manual Benjamin Cummins, New York. 1996.
- Kannan. N (1996). Laboratory manual in General Microbiology. Palani Publications.
- Sundararaj T (2005). Microbiology Lab Manual (1<sup>st</sup> edition) publications.
- Gunasekaran, P. (1996). Laboratory manual in Microbiology. New Age International Ltd., Publishers, New Delhi.
- R C Dubey and D K Maheswari (2002). Practical Microbiology. S. Chand Publishing

### References Books

- Atlas. R (1997). Principles of Microbiology, 2<sup>nd</sup> Edition, Wm.C. Brown publishers.
- Amita J, Jyotsna A and Vimala V (2018). Microbiology Practical Manual. (1<sup>st</sup> Edition). Elsevier India
- Talib VH (2019). Handbook Medical Laboratory Technology. (2<sup>nd</sup> Edition). CBS
- Wheelis M, (2010). Principles of Modern Microbiology, 1<sup>st</sup> Edition. Jones and Bartlett Publication.



- Lim D. (1998). Microbiology, 2<sup>nd</sup> Edition, WCB McGraw Hill Publications

### **Web Resources**

1. <http://www.biologydiscussion.com/micro-biology/sterilisation-and-disinfection-methods-and-principles-microbiology/24403>.
2. <https://www.ebooks.cambridge.org/ebook.jsf?bid=CBO9781139170635>
3. [https://www.grsmu.by/files/file/university/cafedry//files/essential\\_microbiology.pdf](https://www.grsmu.by/files/file/university/cafedry//files/essential_microbiology.pdf)
4. <https://microbiologyinfo.com/top-and-best-microbiology-books/>
5. <https://www.cliffsnotes.com/studyguides/biology/microbiology/introduction-to-microbiology/a-brief-history-of-microbiology>

<b>YEAR – I</b>	<b>SOCIAL AND PREVENTIVE MEDICINE</b> (For the students who are admitted in the year 2023 – 2026 and onwards)	<b>NMB101</b>
<b>SEMESTER - I</b>		<b>HRS/WK – 2</b>
<b>Skill Enhancement Course SEC - 1 (NME)</b>		<b>CREDITS - 2</b>

**Objective:** To make the students understand the basics in social and preventive medicine

**Course Outcomes:**

Upon successful completion of the course, the student:

**CO 1:** Identify the health information system

**CO 2:** Associate various factors with health management system

**CO 3:** Know about the various health care services

**CO 4:** Appraise the role of preventive medicine in community Setting

**CO 5:** Recommend the usage of alternate medicine during Outbreaks

<b>SEMESTER</b> : <b>II</b>	<b>COURSE CODE:</b> <b>NMB101</b>					<b>COURSE TITLE:</b> <b>SOCIAL AND PREVENTIVE MEDICINE</b>			<b>HOURS</b> : <b>2</b>	<b>CREDITS</b> : <b>2</b>
<b>COURSE OUTCOME S</b>	<b>PROGRAMME OUTCOMES (PO)</b>					<b>PROGRAMME SPECIFIC OUTCOMES (PSO)</b>			<b>MEAN SCORE OF COs</b>	
	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PSO 1</b>	<b>PSO 2</b>	<b>PSO 3</b>		
<b>CO1</b>	2	5	4	4	3	3	3	4	<b>3.5</b>	
<b>CO2</b>	2	4	4	4	4	3	3	4	<b>4.3</b>	
<b>CO3</b>	2	3	3	4	3	2	3	3	<b>2.8</b>	
<b>CO4</b>	3	5	4	4	4	3	5	4	<b>4.0</b>	
<b>CO5</b>	3	3	3	5	5	4	4	4	<b>3.8</b>	
<b>Mean Overall Score</b>									<b>3.6</b>	

**Result:** The score of this course is 3.6 (High)

<b>Association</b>	<b>1%-20%</b>	<b>21%-40%</b>	<b>41%-60%</b>	<b>61%-80%</b>	<b>81%- 100%</b>
<b>Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Interval</b>	<b>0&lt;=rating&lt;=1</b>	<b>1.1&lt;=rating&lt;=2</b>	<b>2.1&lt;=rating&lt;=3</b>	<b>3.1&lt;=rating&lt;=4</b>	<b>4.1&lt;=rating&lt;=5</b>
<b>Rating</b>	<b>Very Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>High</b>	<b>Very High</b>

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

**Unit – 1** **(6 Hrs)**

**Introduction to social medicine:** History of social medicine-concepts of health and disease-social determinants of health and disease – Health and quality of life – Health information system –measures of population health – health policies.

**Unit – 2** **(6 Hrs)**

**Health management:** Applications of behavioral sciences and psychology in health management- nutritional programs for health management- water and sanitation in human health-national programs for communicable and non-communicable diseases-environmental and occupational hazards and their control.

**Unit – 3** **(6 Hrs)**

**Health care and services:** Health care of the community - information, education, communication and training in health – maternal & child health- school health services - Geriatrics-care and welfare of the aged- Mental health – health services through general practitioners.

**Unit – 4** **(6 Hrs)**

**Preventive medicine:** Introduction- role of preventive medicine- levels of prevention-Risk assessment in communities and vulnerable population–surveillance, monitoring and reporting of disease outbreaks-forecasting and control measures in community Setting – early detection methods.

**Unit – 5** **(6 Hrs)**

**Prevention through alternate medicine:** Unani, Ayurveda, Homeopathy, Naturopathy systems in epidemic and pandemic outbreaks. International health regulations. Infectious disease outbreak case studies and precautionary response during SARS and MERS coronavirus, Ebola and novel SARS-COV2 outbreaks.

**Text Book**

- Park. K (2021). Textbook of preventive and social medicine, 26<sup>th</sup> edition. Banarsidas Bhanot publishers.
- Mahajan & Gupta (2013). Textbook of preventive and social medicine, 4<sup>th</sup> edition. Jaypee brothers medical publishers.
- Chun - SuYuan, Eric J. Bieber, Brent Bauer (2006). Textbook of Complementary and Alternative Medicine. Second Edition. Routledge publishers.
- Vivek Jain (2020). Review of Preventive and Social Medicine: Including Biostatistics. 12<sup>th</sup>

edition, Jaypee Brothers Medical Publishers.

- Lal Adarsh Pankaj Sunder (2011). Textbook of Community Medicine: Preventive and Social Medicine, CBS publisher.

### **Reference Books**

- Howard Waitzkin, Alina Pérez, Matt Anderson (2021). Social Medicine and the Coming Transformation. First Edition. Routledge publishers.
- G N Prabhakaran ( 2010). Short Textbook of Preventive and Social Medicine. Second Edition. Jaypee publishers.
- Jerry M. Suls, Karina W. Davidson, Robert M. Kaplan (2010). Handbook of Health Psychology and Behavioral Medicine. Guilford Press
- Marie Eloïse Muller, Marie Muller, Marthie Bezuidenhout, Karien Jooste (2006). Health Care Service Management. Juta and Company Ltd.
- Geoffrey Rose (2008). Rose's Strategy of Preventive Medicine: The Complete. OUP Oxford.

### **Web Resources**

- <https://www.omicsonline.org/scholarly/social--preventive-medicine-journals-articles-ppts-list.php>
- [https://www.teacheron.com/online-md\\_preventive\\_and\\_social\\_medicine-tutors](https://www.teacheron.com/online-md_preventive_and_social_medicine-tutors)
- <https://www.futurelearn.com>
- <https://www.healthcare-management-degree.net>
- <https://www.conestogac.on.health-care-administration-and-service-management>

<b>YEAR - I</b>	<b>GENERAL MICROBIOLOGY AND MICROBIAL DIVERSITY</b> (For those students admitted in the year 2023 – 24 and onwards)	<b>PMB11A</b>
<b>SEMESTER - I</b>		<b>HRS/WK - 7</b>
<b>CORE - 1</b>		<b>CREDITS - 5</b>

**Objective:** To make the students understand the Fundamental Principles of Microbiology

**Course Outcomes:**

Upon successful completion of the course, the student:

**CO1:** Acquires knowledge about History of Microbiology and Bacterial taxonomy

**CO2:** Attains knowledge about Microscopy and Staining techniques

**CO3:** Learns about Prokaryotic cell structure and function

**CO4:** Understands the Characteristics and importance of fungi, algae, protozoa, viruses

**CO5:** Gains knowledge about Sterilization and Antimicrobial therapy

SEMESTER: I	COURSE CODE: PMB11A				COURSE TITLE: FUNDAMENTALS OF MICROBIOLOGY				HOURS: 7	CREDITS: 5
COURSE OUTCOMES	PROGRAMME OUTCOMES (PO)				PROGRAMME SPECIFIC OUTCOMES (PSO)				MEAN SCORE OF COs	
	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4		
CO1	4	4	4	4	4	4	4	4	3.5	
CO2	4	4	4	4	4	4	4	4	3.5	
CO3	4	4	4	4	4	4	4	4	3.5	
CO4	4	4	4	3	4	4	4	3	3.25	
CO5	4	4	4	3	4	4	4	3	3.25	
<b>Mean Overall Score</b>									<b>3.4</b>	

**Result:** The score of this course is 3.4 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

**Unit- 1**

(21 Hrs)

History and Scope of Microbiology. Microscopy– Principles and applications. Types of Microscopes - Bright field, Dark- field, Phase-contrast, Fluorescence microscope, Transmission electron microscope (TEM) and Scanning electron microscope (SEM). Sample preparation for SEM & TEM. Atomic force, Confocal microscope. Micrometry – Stage, Ocular and its applications

**Unit- 2****(21 Hrs)**

Microbial techniques - Safety guidelines in Microbiology Laboratories. Sterilization, Disinfection and its validation. Staining methods – Simple, Differential and Special staining. Automated Microbial identification systems - Pure cultures techniques – Cultivation of Anaerobic organisms. Maintenance and preservation of pure cultures. Culture collection centres - National and International.

**Unit- 3****(21 Hrs)**

Algae - Distribution, morphology, classification, reproduction and economic importance. Isolation of algae from soil and water. Media and methods used for culturing algae, Strain selection and large-scale cultivation. Life cycle - *Chlamydomonas*, *Volvox**Spirogyra* (Green algae), *N* (Red algae).

**Unit- 4****(21 Hrs)**

Bacterial Structure, properties and biosynthesis of cellular components – Cell wall. Actinomycetes and Fungi - Distribution, morphology, classification, reproduction and economic importance. Sporulation. Growth and nutrition - Nutritional requirements, Growth curve, Kinetics of growth, Batch culture, Synchronous growth, Measurement of growth and factors affecting growth.

**Unit- 5****(21 Hrs)**

Biodiversity - Introduction to microbial biodiversity – Thermophiles - Classification, Thermophilic Archaeobacteria and its applications. Methanogens - Classification, Habitats, applications. Alkaliphiles and Acidophiles - Classification, discovery basin, its cell wall and membrane. Barophiles - Classification and its applications. Halophiles - Classification, discovery basin, cell walls and membranes – purple membrane, compatible solutes. Microbial stress response – Osmoadaptation / halotolerance - Applications of halophiles.

**Text Book**

- Kanunga R. (2017). Ananthanarayanan and Panicker's Text book of Microbiology. (10<sup>th</sup> Edition). Universities Press (India ) Pvt. Ltd.
- Chan E.C.S., Pelczar M. J. Jr. and Krieg N. R. (2010). Microbiology. (5<sup>th</sup> Edition). Mc.Graw Hill. Inc, New York.
- Prescott L. M., Harley J. P. and Klein D. A. (2004). Microbiology. (6<sup>th</sup> Edition). McGraw Hill company, New York.
- White D. Drummond J. and Fuqua C. (2011). The Physiology and Biochemistry of Prokaryotes, Oxford University Press, Oxford, New York.
- Dubey R.C. and Maheshwari D. K. (2009). Textbook of Microbiology. S. Chand, Limited.

## Reference Books

1. Tortora G. J., Funke B. R. and Case C. L. (2015). Microbiology: An Introduction (12<sup>th</sup> Edition). Pearson, London, United Kingdom
2. Webster J. and Weber R.W.S. (2007). Introduction to Fungi. (3<sup>rd</sup> Edition). Cambridge University Press, Cambridge.
3. Schaechter M. and Leaderberg J. (2004). The Desk encyclopedia of Microbiology. Elsevier Academic Press, California.
4. Ingraham, J.L. and Ingraham, C.A. (2000) Introduction to Microbiology. (2<sup>nd</sup> Edition). Books / Cole Thomson Learning, UK.

## Web Resources

- <https://courses.lumenlearning.com/boundless-microbiology/chapter/microbial-nutrition/>
- <https://www.lamission.edu/lifesciences/lecturenote/mic20/Chap06Growth.pdf>
- <https://www.tandfonline.com/doi/abs/10.3109/07388558409082583?journalCode=ibty20>
- [https://www.sciencedirect.com/topics/neuroscience/microbial-respiration.](https://www.sciencedirect.com/topics/neuroscience/microbial-respiration)

<b>YEAR - I</b>	<b>MICROBIAL PHYSIOLOGY</b> (For those students admitted in the year 2023 – 24 and onwards)	<b>PMB12A</b>
<b>SEMESTER - I</b>		<b>HRS/WK - 7</b>
<b>CORE - II</b>		<b>CREDITS - 5</b>

**Objective:** To enable students to understand the physiology of microorganisms.

**Course Outcomes:**

Upon successful completion of the course, the student:

**CO1:** Illustrate Bacterial nutrition and their utilization.

**CO2:** Discuss cultivation methods and factors related to microbial growth.

**CO3:** Demonstrate concepts of microbial metabolism.

**CO4:** Impart the fundamentals and importance of biosynthetic pathways.

**CO5:** Discuss the methods involved in Photosynthesis.

SEMESTER: II	COURSE CODE: PMB12A				COURSE TITLE: MICROBIAL PHYSIOLOGY				HOURS: 7	CREDITS: 5
COURSE OUTCOMES	PROGRAMME OUTCOMES (PO)				PROGRAMME SPECIFIC OUTCOMES (PSO)				MEAN SCORE OF COs	
	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4		
CO1	3.5	3.5	4	3.5	4	3.5	4	3.5	3.68	
CO2	3	3.5	4	3.5	3.5	4	3.5	4	3.62	
CO3	3.5	4	4	3.5	4	3.5	4	3.5	3.75	
CO4	3.5	3.5	3.5	3.5	4	4	3.5	4	3.68	
CO5	4	4	3	3	4	3	3.5	4	3.56	
<b>Mean Overall Score</b>									<b>3.66</b>	

**Result:** The score of this course is 3.66 (High)

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

**Unit - 1**

(21 Hrs)

Nutrition – Nutritional requirements and types in bacteria – Phototrophs, Chemotrophs, Autotrophs and Heterotrophs. Nutrient transport mechanisms- Passive diffusion, Facilitated diffusion, Active transport, Group translocation and Specific transport system..



**Unit - 2****(21 Hrs)**

Microbial growth – Growth curve and Measurement of Growth – Cell Number and Cell Mass and metabolic activity. Batch, Continuous, Synchronous and Asynchronous cultures, Factors affecting growth.

**Unit - 3****(21 Hrs)**

Enzymes – properties, functions and regulation. Basic concepts of metabolism, Oxidation reduction reactions, Energy generation by anaerobic metabolism – Glycolysis, Pentose Phosphate pathway- ED pathway, Fermentation. Energy generation by Aerobic metabolism - TCA cycle, Glycoxylate pathway and Electron Transport chain, Mechanism of ATP synthesis– Chemiosmosis, Pasteur effect. Metabolism of lipids- $\beta$  oxidation.

**Unit - 4****(21 Hrs)**

Anaerobic Respiration. Nitrogen, Sulphur, Iron and Hydrogen Oxidation. Methanogenesis. Biosynthesis – Gluconeogenesis, Peptidoglycan synthesis, Amino acids, Purines, Pyrimidines Fattyacids, Triglycerides, Phospholipids and Sterols.

**Unit - 5****(21 Hrs)**

Photosynthesis – process, antenna of light-harvesting pigments, Photochemical reaction centers, Photosynthetic Electron Transport Chain-Cyclic and Non-cyclic. Oxygenic and Anoxygenic Photosynthesis. Calvin-Benson cycle.

**Text Book**

- Stanier R.Y., Ingraham, J.L., Wheelis, M.L and Painter, P.R. (2010). General Microbiology. 5th Edn. Macmilan education Ltd. London.
- Prescott. L.M., Harley. J.P., Klein. D.A. (1993). Microbiology. 2<sup>nd</sup> edn. Wm. C. Brown publishers, Dubugue.
- Moat, A.G. and Foster, J.W. (2003). Microbial Physiology.4th Edn. John Wiley and Sons, New York.
- Doelle, H.W. (1975) Bacterial Metabolism, 2<sup>nd</sup> Edn. Academic Press, London.
- Caldwell, D.R (2000) Microbial physiology and metabolism, 2<sup>nd</sup> Edn. Star publishing, Belmont, California.

**Reference Book:**

- Salle. A.J. (1992). Fundamental Principles of Bacteriology. 7<sup>th</sup> edn. McGraw Hill Inc. New York
- Madigan, M.T., Martinko, J.M., & Parker J. (2000). Brock Biology of Microorganisms. 9<sup>th</sup> Edn. Prentice Hall International, Inc, London.
- Ingraham, J.L., & Ingraham, C.A. (2000). Introduction to Microbiology. 2<sup>nd</sup>Edn. Brook /Cole. Singapore
- Gottschalk, G. (1986). Bacterial Metabolism. 2<sup>nd</sup> Edn. Springer-Verlag, New York.

<b>YEAR - I</b>	<b>PRACTICAL I</b>	<b>PMBP11A</b>
<b>SEMESTER - I</b>		<b>HRS/ WK-8</b>
<b>PRACTICAL</b>		<b>CREDITS -4</b>

1. Microscopic Techniques: Light microscopy: Hay infusion broth. Wet mount to show different types of microbes, hanging drop.
2. Micrometry.
3. Dark field microscopy – Motility of Spirochetes.
4. Washing and cleaning of glass wares: Sterilization methods: moist heat, dry heat, and filtration.
5. Quality control check for each method.
6. Staining techniques - Simple staining, Gram's staining, Acid fast staining, Meta chromatic granule staining, Spore, Capsule, Flagella.
7. Media Preparation: Preparation of liquid, solid and semisolid media. Agar deeps, slants, plates. preparation of basal, enriched, selective and enrichment media.
8. Preparation of Biochemical test media, media to demonstrate enzymatic activities.
9. Purification and maintenance of microbes. Streak plate, pour plate, and slide culture technique. Aseptic transfer.
10. Direct counts – Total cell count, Turbidometry. Viable count - pour plate, spread plate.
11. Bacterial growth curve. Effect of physical and chemical factors on growth. Anaerobic culture methods.

## COURSE OUTCOME

<b>I B.Sc Zoology</b>	<b>INVERTEBRATA</b>	<b>ZO101A</b>
<b>SEMESTER - I</b>		<b>HRS/WK – 6</b>
<b>CORE – I</b>		<b>CREDIT – 6</b>

### Objective:

1. To understand the basic concepts of invertebrates and observe the structure and functions.
2. To illustrate and examine the systemic and functional morphology of various group of invertebrates.
3. To differentiate and classify the various groups of animals, modes of life and to estimate the biodiversity.
4. To compare and distinguish the general and specific characteristics of reproduction in invertebrates.
5. To infer and integrate the parasitic and economic importance of invertebrates

### Course Outcomes (CO's):

On completion of the course students will be able

**CO1:** Understand the basic concepts of invertebrate animals and recall its structure and functions.

**CO2:** Illustrate and examine the systemic and functional morphology of various groups of invertebrata.

**CO3:** Differentiate and classify the animal's mode of life in various taxa and estimate the biodiversity.

**CO4:** To compare and distinguish the various physiological processes and organ systems in lower animals.

**CO5:** Infer and integrate the parasitic and economic importance of invertebrate animals.

### Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes

SEMESTER I	COURSE CODE: ZO101A	COURSE TITLE: INVERTEBRATA														HOURS: 6	CREDITS: 6
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)										MEAN SCORE OF CO'S	
	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO 10		
CO1	5	5	5	5	4	5	5	5	4	4	5	4	5	4	5	4.7	
CO2	5	5	5	5	4	5	5	5	4	4	5	3	5	4	5	4.6	
CO3	5	5	5	5	4	5	5	5	4	4	5	3	5	4	5	4.6	
CO4	5	5	5	5	4	5	5	5	4	4	5	3	5	4	5	4.6	
CO5	5	5	5	5	4	5	5	5	4	4	5	3	5	4	5	4.6	
Mean Overall Score																4.6	

**Result: The Score of this Course is 4.6 (Very High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome

### UNIT – 1: PROTOZOA AND PORIFERA

**18 Hours**

**Protozoa:** Introduction to Classification, taxonomy and nomenclature. General characters and classification of Phylum Protozoa up to classes. Type study - *Paramecium* and *Plasmodium* -

Parasitic protozoans (*Entamoeba*, *Trypanosoma* & *Leishmania*) - Economic importance. - Host-parasitic interactions in *Entamoeba* and *Plasmodium*- Nutrition and Locomotion in protozoa

**Porifera:** General characters and classification up to Classes. Type study - Ascon & Sycon - Canal system in sponges - Skeleton in sponges, Reproduction in sponges Economic importance of sponges.

## **UNIT – 2: COELENTERATA AND PLATYHELMINTHS**

**18 Hours**

**Coelenterata :** General characters and classification up to classes – Type study - *Obelia* and *Aurelia* - Corals and coral reefs - Polymorphism - Mesenteries in Anthozoa - Polymorphism in Hydrozoa. Economic importance of corals and coral reefs.

**Platyhelminths:** General characters and classification of up to classes. Type study – *Fasciola hepatica*. Nematelminthes: *Taenia solium* – Parasitic adaptations. Host-parasitic interactions of Helminth parasites. Nematode Parasites and diseases - *Wuchereria bancrofti*, *Enterobius vermicularis*, *Ancylostome duodenale*. Aschelminthes : General characters and classification of up to classes - Type study - *Ascaris lumbricoides*

## **UNIT–3:ANNELIDA AND ARTHROPODA**

**18 Hours**

**Annelida:** General characters and classification up to Classes. Type study – *Nereis* and *Hirudinaria granulosa*. Metamerism Nephridium and coelomoducts - Modes of life in Annelids. Reproduction in polychaetes

**Arthropoda:** General characters and classification of Phylum Arthropoda up to Classes. Detailed study: *Panaeus indicus*. Affinities of *Peripatus* – Larval forms in Crustacea – Organization of Centipede and Millipede

## **UNIT – 4: MOLLUSCA**

**18 Hours**

**Mollusca:** General characters and classification of Phylum Mollusca up to Classes. Detailed study: *Pila globosa*. Foot and torsion in Mollusca, Economic importance of Molluscs – Cephalopoda as the most advanced invertebrate.

## **UNIT – 5: ECHINODERMATA**

**18 Hours**

**Echinodermata:** General characters and classification of Phylum Echinodermata up to Classes. Detailed study: *Asterias*. Water vascular system in Echinodermata – Larval forms of Echinoderms.

## **TEXT BOOKS**

1. Arumugam, N., T. Murugan, B. Ramanathan and M.G Ragunathan. (2019). *A Text Book of Invertebrates*, Saras Publications, Nagercoil, Tamil Nadu.
2. Ekambaranatha Ayyar .M., (1973). *A Manual of Zoology – Part I, Invertebrata*. S. Viswanathan Printers and Publishers Pvt., Ltd., Madras.
3. Jordon, E.L. and P.S Verma, (2014). *Invertebrate Zoology*. S. Chand and Co. Ltd., New Delhi
4. Adam Sedgwick, (1960). *A student's text book of Zoology, Vol. I & III*, General Book Depot, Allahabad.
5. Hyman, L.H. (1951). *The Invertebrates*,. Vol. I, McGraw Hill Book Co., New York.
6. Kotpal.R.L., (2017). *Modern Text book of Zoology-Invertebrata, (Animal Diversity- I)*. Rastogi Publications, New Delhi.

## REFERENCE BOOKS

1. Arumugam, N. (2014). *Animal diversity Volume -1 – Invertebrata*. Saras Publication, Nagercoil, Tamil Nadu
2. Fatik Baran. (2012). *Invertebrate Zoology*. **Prentice Hall of India** Pvt Ltd., New Delhi.
3. Barrington E.J.W. (2012). *Invertebrate structure and function*. Affiliated East West Press Pvt. Ltd., New Delhi.
4. Richard C. Brusca, Wendy Moore and Stephen M. Shuster. ( 2016). *Invertebrates*. **Oxford University Press**, USA.
5. Clarkson E.N.K. (2011). *Invertebrate Palaeontology and Evolution*. Wiley India Pvt. Ltd., New Delhi

<b>I B.Sc Zoology</b>	<b>CORE PRACTICAL – I INVERTEBRATA</b>	<b>ZOP101</b>
<b>SEMESTER – I</b>		<b>HRS/WK – 3</b>
<b>CORE PRACTICAL – I</b>		<b>CREDIT – 2</b>

**MAJOR DISSECTION:** Cockroach: Circulatory system, Nervous system, Reproductive system. Leech : Nervous System, Reproductive system. Earthworm: Nervous System, Reproductive system. *Pila globosa*: Nervous system. Prawn: Nervous system (including Appendages).

**MINOR DISSECTION:** Cockroach: Digestive system. Earthworm: Viscera, Lateral hearts.

*Pila globosa*: Digestive system (Including radula). Freshwater Mussel: Digestive system.

**MOUNTING:** Earthworm: Body setae; Pineal setae. *Pila globosa*: Radula. Freshwater muscle: Pedal ganglia.

**MOUNTING :** Cockroach: Salivary apparatus, Mouth parts - Honey Bee, House fly and Mosquito mouth parts.

**SPOTTERS:(i). Protozoa:** Amoeba, Paramecium, Paramecium Binary fission and Conjugation, Vorticella, Entamoeba histolytica, Plasmodium vivax **(ii). Porifera:** Sycon, Spongilla, Euspongia, Sycon - T.S & L.S, Spicules, Gemmule **(iii). Coelenterata:** Obelia – Colony & Medusa, Aurelia, Physalia, Velella, Corallium, Gorgonia, Pennatula **(iv). Platyhelminthes:** Planaria, Fasciola hepatica, Fasciola larval forms – Miracidium, Redia, Cercaria, Echinococcus granulosus, Taenia solium, Schistosoma haematobium **(v). Nematelminthes:** Ascaris(Male & Female), Dracunculus, Ancylostoma, Wuchereria **(vi). Annelida:** Nereis, Aphrodite, Chaetopteurs, Hirudinaria, Trochophore larva **(vii). Arthropoda:** Cancer, Palaemon, Scorpion, Scolopendra, Sacculina, Limulus, Peripatus, Larvae - Nauplius, Mysis, Zoea, Mouth parts of male & female Anopheles and Culex, Mouthparts of Housefly and Butterfly. **(viii). Mollusca:** Chiton, Pila, Unio, Pteredo, Murex, Sepia, Loligo, Octopus, Nautilus, Glochidium larva **(ix). Echinodermata:** Asterias, Ophiothrix, Echinus, Clypeaster, Cucumaria, Antedon, Bipinnaria larva

### **Text Books**

#### **(Latest Editions)**

1. Ekambaranatha Iyyar and T. N. Ananthakrishnan, 1995 A manual of Zoology Vol.I (Part 1, 2) S. Viswanathan, Chennai.
2. Ganguly, Sinha and A dhikari , 2 0 1 1 . Biology of Animals: Volume I, New Central Book Agency; 3rd revised edition. 1008 pp.
3. Sinha, Chatterjee and Chattopadhyay, 2 0 1 4. Advanced Practical Zoology, Books & Allied Ltd; 3rd Revised edition, 1 0 7 0 pp.
4. Lal ,S. S, 2016 . Practical Zoology Invertebrate, Rastogi Publications.
5. Verma, P. S. 2010. A Manual of Practical Zoology: Invertebrates, S Chand, 4 97pp.

## References Books

(Latest editions, and the style as given below must be strictly adhered to)

1. Barnes, R.S.K., Calow, P., Olive, P.J.W., Golding, D.W. and Spicer, J.I. (2002). *The Invertebrates: A New Synthesis*, III Edition, Blackwell Science.
2. Barnes, R.D. (1982). *Invertebrate Zoology*, V Edition. Holt Saunders International Edition.
3. Barrington, E.J.W. (1979). *Invertebrate Structure and Functions*. II Edition, E.L.B.S. and Nelson
4. Boradale, L.A. and Potts, E.A. (1961). *Invertebrates: A Manual for the use of Students*. Asia Publishing Home.
5. Lal, S.S. 2005. A text Book of Practical Zoology: Invertebrate, Rastogi, Meerut

<b>I B.Sc Zoology</b>	<b>ALLIED BOTANY</b>	<b>ABZ101B</b>
<b>SEMESTER – I</b>		<b>HRS/WK – 3</b>
<b>ALLIED/ ELECTIVE</b>		<b>CREDIT –2</b>

**Objective:**

1. To study morphological and anatomical adaptations of plants of various habitats.
2. To demonstrate techniques of plant tissue culture.
3. To familiarize with the structure of DNA, RNA.
4. To carryout experiments related with plant physiology.
5. To perform biochemistry experiments.

**Course Outcomes (CO)**

At the end of the course, the student will be able to

- CO1:** Increase the awareness and appreciation of human friendly algae and their economic importance.
- CO2:** Develop an understanding of microbes and fungi and appreciate their adaptive strategies.
- CO3:** Develop critical understanding on morphology, anatomy and reproduction of Bryophytes, Pteridophytes and Gymnosperms.
- CO4:** Compare the structure and function of cells and explain the development of cells.
- CO5:** Understand the core concepts and fundamentals of plant biotechnology and genetic engineering.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER I	COURSE CODE: ABZ101B					COURSE TITLE: ALLIED BOTANY										HOUR S: 3	CRED ITS:2
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)										MEAN SCORE OF CO'S	
	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO 10		
CO1	5	5	5	5	4	5	4	4	2	3	5	1	5	1	5	4.0	
CO2	5	5	5	5	4	5	4	3	4	4	5	1	5	1	5	4.1	
CO3	5	5	4	5	4	5	4	3	3	4	5	1	5	2	5	4.0	
CO4	5	5	4	5	4	5	4	3	3	3	5	1	5	3	5	4.0	
CO5	5	5	4	5	4	5	4	3	2	4	5	2	5	3	5	4.1	
Mean Overall Score															4.0		

**Result: The Score of this Course is 4.0 (High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcome and Programme Specific Outcome



**UNIT – 1: ALGAE:****9 Hours**

General characters of algae - Structure, reproduction and life cycle of the following genera - *Anabaena* and *Sargassum* and economic importance of algae.

**UNIT – 2: FUNGI, BACTERIA AND VIRUS:****9 Hours**

General characters of fungi, structure, reproduction and life cycle of the following genera - *Penicillium* and *Agaricus* and economic importance of fungi.

Bacteria - general characters, structure and reproduction of *Escherichia coli* and economic importance of bacteria. Virus - general characters, structure of TMV, structure of bacteriophage.

**UNIT – 3: BRYOPHYTES, PTERIDOPHYTES AND GYMNOSPERMS: 9 Hours**

General characters of Bryophytes, Structure and life cycle of *Funaria*.

General characters of Pteridophytes, Structure and life cycle of *Lycopodium*.

General characters of Gymnosperms, Structure and life cycle of *Cycas*.

**UNIT – 4: CELL BIOLOGY:****9 Hours**

Prokaryotic and Eukaryotic cell- structure /organization. Cell organelles - ultra structure and function of chloroplast, mitochondria and nucleus. Cell division - mitosis and meiosis.

**UNIT – 5: GENETICS AND PLANT BIOTECHNOLOGY:****9 Hours**

Mendelism - Law of dominance, Law of segregation, Incomplete dominance. Law of independent assortment. Monohybrid and dihybrid cross - Test cross - Back cross. Plant tissue culture - *In vitro* culture methods. Plant tissue culture and its application in biotechnology.

**Text Books:**

1. Singh, V., Pande, P.C and Jain, D.K. 2021. A Text Book of Botany. Rastogi Publications, Meerut.
2. Bhatnagar, S.P and Alok Moitra. 2020. Gymnosperms, New Age International (P) Ltd., Publishers, Bengaluru.
3. Sharma, O.P. 2017. Bryophyta, MacMillan India Ltd. Delhi.
4. Lee, R.E. 2008. Phycology, IV Edition, Cambridge University Press, New Delhi.
5. Rao, K., Krishnamurthy, K.V and Rao, G.S. 1979. Ancillary Botany, S. Viswanathan Pvt. Ltd., Madras.

**Reference books:**

1. Parihar, N.S. 2012. An introduction to Embryophyta –Pteridophytes - Surjeet Publications, Delhi.
2. Alexopoulos, C.J. 2013. Introduction to Mycology. Willey Eastern Pvt. Ltd.
3. Vashishta, P.C. 2014. Botany for Degree Students Gymnosperms. Chand & Company Ltd, Delhi.
4. Coulter, M. Jhon, 2014. Morphology of Gymnosperms. Surjeet Publications, Delhi.
5. Vashishta, P.C. 2014. Botany for Degree Students Algae. 2014. Chand & Company Ltd, Delhi.
6. Parihar, N.S. 2013. An introduction to Embryophyta –Bryophytes -, Surjeet Publications, Delhi.
7. Pandey B.P. 1986, Text Book of Botany (College Botany) Vol I & II, S.Chand and Co. New Delhi.

**Web Resources**

1. <https://www.kobo.com/us/en/ebook/the-algae-world>

2. [http://www.freebookcentre.net/biology-books-download/Fungi-\(PDF-15P\).html](http://www.freebookcentre.net/biology-books-download/Fungi-(PDF-15P).html)
3. <http://scitec.uwichill.edu.bb/bcs/bl14apl/bryo1.htm>
4. <https://www.toppr.com/guides/biology/plant-kingdom/pteridophytes/>
5. <https://arboretum.harvard.edu/wp-content/uploads/2013-70-4-beyond-pine-cones-an-introduction-to-gymnosperms.pdf>
6. <https://www.us.elsevierhealth.com/medicine/cell-biology>
7. <https://www.us.elsevierhealth.com/medicine/genetics>
8. <https://www.kobo.com/us/en/ebook/plant-biotechnology-1>

<b>I B.Sc Zoology</b>	<b>ALLIED BOTANY PRACTICAL</b>	<b>ABZP11A</b>
<b>SEMESTER – I</b>		<b>HRS/WK –2</b>
<b>ALLIED/ ELECTIVE PRACTICAL</b>		<b>CREDIT –2</b>

### **Objectives:**

- To enhance information on the identification of each taxonomical group by developing the skill-based detection of the morphology and microstructure of microorganisms, algae, and fungi
- To comprehend the fundamental concepts and methods used to identify Bryophytes, Pteridophytes and Gymnosperms through morphological changes and evolution, anatomy and reproduction.
- To be familiar with the basic concepts and principles of cell biology.
- Understanding of laws of inheritance, genetic basis of loci and alleles.
- To learn about the principles and applications of Biotechnology

### **EXPERIMENTS**

1. Make suitable micro preparation of the types prescribed in Algae, Fungi, Bryophytes, Pteridophytes and Gymnosperms.
2. Micro photographs of the cell organelles ultra structure.
3. Simple genetic problems.
4. Spotters - Algae, Fungi, Bryophytes, Pteridophytes, Gymnosperms Cell biology and Biotechnology.

### **Bonafide record of practical work done should be submitted for the practical examination**

#### **Course outcomes:**

On completion of this course, the students will be able to:

1. To study the internal organization of algae .
2. To study the structure and organization of fungi, bacteria and viruses
3. Develop critical understanding on morphology, anatomy and reproduction of Bryophytes, Pteridophytes and Gymnosperms.
4. To study the cell structure and function.
5. Understand the fundamental concepts of genetics and Biotechnology

#### **Recommended texts**

1. Sharma, O.P. 2017. Bryophyta, MacMillan India Ltd, New Delhi.
2. Sharma, O.P. 2012. Pteridophyta, Tata McGraw-Hills Ltd, New Delhi.
3. Subramaniam, N.S. 1996. Laboratory Manual of Plant Taxonomy. Vikas Publishing House Pvt. Ltd., New Delhi.
4. Benjamin, A. Pierce. 2012. Genetics- A conceptual Approach. W.H. Freeman and Company, New York, England.
5. Noggle G.R and G.J. Fritz. 2002. Introductory Plant Physiology. Prentice Hall of India, New Delhi.

#### **Reference books**

1. Strickberger, M.W. 2005. Genetics (III Ed). Prentice Hall, New Delhi, India.
2. Nancy Sereidiak and M. Huynh. 2011. Algae identification lab Guide. Accompanying manual to algae identification field guide, Ottawa Agriculture and Agri food Canada publisher.

3. Mohammed Gufran Khan, Shite Gatew and Bedilu Bekele. 2012. Practical manual for Bryophytes and Pteridophytes. Lambert Academic Publishing.
4. Aler Gingauz.2001. MedicinalChemistry.OxfordUniversityPress&WileyPublications.
5. Steward, F.C. 2012. Plant Physiology Academic Press, US

**Web Resources**

1. <https://www.amazon.in/Practical-Manual-Pteridophyta-Rajan-Sundara/dp/8126106883>
2. <https://www.google.co.in/books/edition/Gymnosperms/3YrT5E3Erm8C?hl=en&gbpv=1&dq=gymnosperms&printsec=frontcover>
3. <https://www.amazon.in/Manual-Practical-Bryophyta-Suresh-Kumar/dp/B0072GNFX4>

<b>I B.Sc Zoology</b>	<b>BIOCOMPOSTING FOR ENTREPRENEURSHIP</b>	<b>NZO101</b>
<b>SEMESTER - I</b>		<b>HRS/WK – 2</b>
<b>SEC– I (NME)</b>		<b>CREDIT – 2</b>

**Objectives:**

1. To highlight the importance of Biocomposting for entrepreneurship in waste management.
2. To enable students for setting up Biocompost units and bins for waste reduction.

**Course Outcomes (CO's):**

On completion of the course students will be able

**CO1:** To Gain knowledge about the process of Biocomposting.

**CO2:** To demonstrate Biocomposting techniques for various end applications like solid waste management, industrial waste recycling using sugarcane bagasse, etc.

**CO3:** To prepare Biocompost pit and bed

**CO4:** To describes Applications of Biocompost

**CO5:** To gain knowledge about the economic cost of establishing small Biocompost units as a cottage industry.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER I	COURSE CODE: NZO101					COURSE TITLE: BIOCOMPOSTING FOR ENTREPRENEURSHIP										HOUR S: 2	CRED ITS:2
	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)											
COURSE OUTCOMES	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO 10		
CO1	5	5	4	4	4	5	5	5	3	4	4	4	5	4	4	4.3	
CO2	5	5	4	4	4	5	5	5	4	4	4	3	5	4	4	4.3	
CO3	5	5	4	4	4	5	5	5	4	4	4	3	5	4	4	4.3	
CO4	5	5	3	4	4	5	5	5	4	4	4	3	5	4	4	4.3	
CO5	5	5	3	4	4	5	5	5	4	4	4	3	5	4	4	4.3	
Mean Overall Score																4.3	

**Result: The Score of this Course is 4.3 (Very High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome

**UNIT – I** **6 Hours**

Biocomposting – Definition, types and ecological importance.

**UNIT – II** **6 Hours**

Types of Biocomposting technology – Field pits/ground heaps/ tank/large-scale/batch and continuous methods.

**UNIT – III** **6 Hours**

Preparation of Biocompost pit and bed using different amendments.

**UNIT – IV** **6 Hours**

Applications of Biocompost in soil fertility maintenance, promotion of plant growth, value added products, waste reduction, etc.

**UNIT – V** **6 Hours**

Economics of establishment of a small biocompost unit – project report proposal for Self Help Group (Income and employment generation).

**Practical**

- Preparation procedures for Biocompost pit.
- Selection of Biocompost material, separation of Compostable and Non-compostable materials.
- Packing and marketing of Biocompost.
- Field visit to Biocomposting unit.

**References**

1. Bikas R. Pati & Santi M. Mandal (2016). Recent trends in composting technology.
2. Van der Wurff, A.W.G., Fuchs, J.G., Raviv, M., Termorshuizen, A.J. (Editors) 2016. Handbook for Composting and Compost Use in Organic Horticulture. BioGreenhouse COST Action FA 1105, [www.biogreenhouse.org](http://www.biogreenhouse.org).
3. S. Gajalakshmi, Indian Journal of Biotechnology Vol 3, October 2004, pp 486-494.
4. T. Ganesh kumar, Lambert Academic Publishing, 2013.
5. T. Ganesh kumar, Bioresources and Bioprocessing, 2014, 1:26.

<b>I B.Sc Zoology</b>	<b>ORNAMENTAL FISH FARMING &amp; MANAGEMENT</b>	<b>FZO101</b>
<b>SEMESTER - I</b>		<b>HRS/WK – 2</b>
<b>FC– I</b>		<b>CREDIT – 2</b>

**Objective:**

1. To highlight the importance of ornamental fish culture in relation to entrepreneurship development.
2. To enable the identification, culture and maintenance of commercially important ornamental fishes.
3. To provide the knowledge on the techniques of ornamental fish breeding, rearing, disease control and economics of ornamental fish farming.

**Course Outcomes (CO's):**

On completion of the course students will be able

**CO1:** To identify, culture, maintain and market the commercially important ornamental fishes.

**CO2:** To understand the biology, food and feeding of egg layers and live bearers

**CO3:** To understand the aquarium construction and maintenance

**CO4:** To understand the economic condition of ornamental fishes

**CO5:** The knowledge and skills gained on the different aspects of ornamental fish keeping will enable the students to develop entrepreneurship potential and help in self employment.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER I	COURSE CODE: FZO101					COURSE TITLE: ORNAMENTAL FISH FARMING & MANAGEMENT										HOUR S: 2	CRED ITS: 2
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)										MEAN SCORE OF CO'S	
	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9	PSO 10		
CO1	5	5	5	5	4	5	5	5	3	4	4	3	5	4	5	4.5	
CO2	5	5	4	5	4	5	5	5	3	4	4	3	5	4	5	4.4	
CO3	4	5	4	5	4	5	5	5	3	4	4	3	5	5	5	4.4	
CO4	4	5	4	5	4	5	3	3	4	4	4	3	5	4	5	4.1	
CO5	4	5	4	5	4	5	3	3	4	4	4	3	5	3	5	4.1	
Mean Overall Score															4.3		

**Result: The Score of this Course is 4.3 (Very High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome

**UNIT I:** **6 Hours**

Introduction to ornamental fish keeping.

Scope and importance of ornamental fish culture.

Domestic and global scenario of ornamental fish trade and export potential.

Commercially important ornamental fishes - Indigenous and exotic varieties.

**UNIT II:** **6 Hours**

Biology of egg layers and live bearers.

Food and feeding in ornamental fishes. Formulated feed and Live feed; Live feed culture.

Breeding, hatchery and nursery management of egg layers (eg. Goldfish) and live bearers (eg. Guppy).

**UNIT III:** **6 Hours**

Aquarium design and construction; Accessories - aerators, filters and lighting.

Aquarium plants and their propagation.

Maintenance of aquarium and water quality management.

Ornamental fish diseases, their prevention, control and treatment methods.

**Unit IV** **6 Hours**

Conditioning, packing, transport and quarantine methods.

Economics, trade regulations, domestic and export marketing strategies.

**Practical** **6 Hours**

1) Identification of locally available ornamental fishes - Egg layers and live bearers.

2) Identification of locally available live feed organisms.

**Text Books:**

1. Arumugam N. 2008. Aquaculture, Saras Publication

2. Jayashree K.V., Tharadevi C.S. and Arumugam N. 2023. Ornamental Fish Farming and Management. Saras Publication.

**References:**

1. Swain SK., Sarangi N. and Ayyappan S. 2010. Ornamental fish farming. ICAR, New Delhi.

2. Living Jewels – A handbook on freshwater ornamental fish, MPEDA, Kochi.

3. Dey V.K.A. 1997. A handbook on aquafarming ornamental fishes. MPEDA, Kochi.

4. Ahilan, B., Felix N. and Santhanam R. 2008. Text book of aquariculture. Daya Publishing House, New Delhi.

**Web links:**

1. <http://ecoursesonline.iasri.res.in/course/view.php?id=297>

2. <https://www.ofish.org/>

3. <https://krishijagran.com/agripedia/income-generation-by-ornamental-fish-culture/>

4. <https://99businessideas.com/ornamental-fish-farming/>



<b>I B.Sc Zoology</b>	<b>CORE PRACTICAL – II CHORDATA</b>	<b>ZOP202</b>
<b>SEMESTER – II</b>		<b>HRS/WK – 3</b>
<b>CORE PRACTICAL – II</b>		<b>CREDIT – 2</b>

### **DISSECTIONS**

**Fish** – Digestive system

### **MINOR PARCTICAL**

**Shark** - Placoid scales

### **SPOTTERS**

**Study of the following specimens**

#### **1. Classify by giving reasons**

Amphioxus, Shark, Hyla, Rhacophorus, Calotes, Pigeon, Rat/Rabbit.

#### **2. Adaptations to their respective modes of life**

Balanoglossus, Ascidian, Ichthyophis, Draco, sea snake and Bat.

#### **3. Biological significance:**

Anabas, Hippocampus, Narcine, Echeneis, Arius, Exocoetus, Eel, Amblystoma, Axolotl Larva, Bufo, Cobra, Krait, Russels Viper, EchisCarinata, Turtle, Parrot, Woodpecker, King Fisher and Ant eater

#### **4. Relate structure and function:**

Ctenoid Scale and Quill Feather of pigeon.

#### **5. Draw labeled sketches:**

T.S. of Amphioxus through Pharynx.

#### **6. Osteology**

**Skeleton** - Pectoral girdles of Frog and Pigeon., Pelvic Girdles of Frog and Pigeon.

Fore and Hind limbs of Frog and Pigeon., Synsacrum of Pigeon. **Dentition** - Dog, Rabbit and Man.

### **Reference Books:**

1. Verma. P.S. 2011 A Manual of Practical Zoology CHORDATES, Chand & co, Ltd. Ram Nagar – New Delhi.
2. JayanpaSinha . 2010 Advanced Practical Zoology, Books & Allied (p) Ltd. No.1. Subham Plaza IFloor, Calcutta.

<b>III B.Sc. Zoology</b>	<b>PROJECT</b>	<b>JZO601</b>
<b>SEMESTER -VI</b>		
<b>PROJECT</b>		<b>CREDIT-2</b>

### **COURSE OBJECTIVES:**

- To provide students with practical experience in biology and biodiversity of organisms.
- To encourage the students to learn the skills in observing and studying nature, biological techniques and scientific investigation.
- To learn the unity and diversity of organisms.
- To learn about applied branches of zoology and prepare for self-employment.

### **COURSE OUTCOMES:**

Upon successful completion of this course, students will be able to:

- Learn the fundamentals of animal sciences and complex interaction between living organisms.
- Understand the basic theories and principles of ecology.
- Learn about gene, genome, cell, tissue, organ and organ system.
- Learn about evolutionary history and relationship between different groups of animals
- Obtain practical knowledge on Vermiculture, Mushroom culture, Aquaculture, Sericulture etc.

### **COURSE CONTENT:**

#### **1. Introduction about the Projects**

- Overview of project work
- Selection of project topics based on recent trends in Zoology

#### **2. Project Design and Development**

- Culturing techniques of animals
  - Selection and procurement of cultivable species
  - Toxicological studies, pollution studies, growth parameters and biology of animals.

#### **3. Documentation and Report Writing**

##### **Arrangement of contents**

1. Title Page
2. Bonafide Certificate
3. Acknowledgement
4. Table of contents
5. Abstract
6. Chapters of the Report
7. References
8. Appendices, if any

Appendices should be named as APPENDIX –A

### **Binding Specification**

- Project report should be submitted with hard bound.
- The Cover should be colour printed.

### **Margin Specification**

Top	: 4 cms
Bottom	: 3 cms
Left	: 4.5 cms
Top	: 2.5 cms

### **Page Numbering**

All Page numbers should be typed without punctuation on the bottom center portion of the page. The Preliminary pages (table of contents and abstract) should be numbered in lowercase roman literals.

### **4. Presentation and Defense**

- Preparing for the project presentation
- Effective communication of project work

## **THEMES**

Students can choose a project theme from the following areas:

### **1. Studies on the biology of animals**

Study of anatomy, behavioural ecology etc.

### **2. Taxonomical status of animals**

Systematic classification, phylogeny of animals etc.

### **3. Biodiversity study**

Species, genetic and ecological diversity

### **4. Biochemical studies**

Biochemical composition, Nutritional value etc.

### **5. Pollution**

Causes, concentration, effects of pollution etc.

### **6. Environmental issues**

Biodiversity laws, waste management, climate change etc.

### **7. Culturing technology of organisms**

Culturing techniques of various organisms

### **8. Molecular techniques**

DNA study, genetical studies, molecular study etc.

### **9. Entomological studies**

Economic classification of insects, pest control measures etc.

### **10. Physiology of animals**

Physiological function of various system

I M.Sc (CS)	<b>ANALYSIS &amp; DESIGN OF ALGORITHMS</b>	PCS11
SEMESTER – I		HRS/WK – 4
CORE – 1		CREDIT – 3

### Objective:

To enable the students to Understood the various design and analysis of the algorithms

### Course Outcomes (COs):

After learning this course, the students should be able to expose:

CO1: Ability to understand fundamental of Algorithms.

CO2: Ability to know Presents an introduction to the algorithms, their analysis and design

CO3: Ability to understand the algorithms, their analysis and design

CO4: Discuss various methods like Basic Traversal And Search Techniques, divide and conquer method, Dynamic programming, backtracking.

CO5: Understood the various design and analysis of the algorithms.

### Relationship Matrix Course Outcome, Programme Outcome and Programme Specific Outcome

SEMESTER I	COURSE CODE: PCS11					COURSE TITLE: ANALYSIS & DESIGN OF ALGORITHMS					HOURS: 4	CREDITS: 3
COURSE OUTCOME	PROGRAMME OUTCOME(PO)					PROGRAMME SPECIFIC OUTCOME(PSO)					MEAN SCORE OF CO'S	
	PO 1	PO 2	PO 3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	4	4	4	4	4	4	5	3	2	5	3.9	
CO2	4	4	4	4	4	4	5	3	2	5	3.9	
CO3	4	4	4	4	4	4	5	3	2	5	3.9	
CO4	4	4	4	4	4	4	5	3	2	5	3.9	
CO5	4	4	4	4	4	4	5	3	2	5	3.9	
Mean Overall Score											3.9	

**Result: The Score of this Course is 3.9(High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **High** association with Programme Outcome and Programme Specific Outcome.

**UNIT - I****[12 Hrs]**

**Introduction:** - Algorithm Definition and Specification – Space complexity-Time Complexity-Asymptotic Notations - Elementary Data Structure: Stacks and Queues – Binary Tree - Binary Search Tree - Heap – Heap sort- Graph.

**UNIT - II****[12 Hrs]**

**TRAVERSALANDSEARCHTECHNIQUES:** Basic Traversal And Search Techniques: Techniques for Binary Trees-Techniques for Graphs -Divide and Conquer: - General Method – Binary Search – Merge Sort – Quick Sort.

**UNIT - III****[12 Hrs s]**

**The Greedy Method:** General Method–Knapsack Problem–Minimum Cost Spanning Tree– Single Source Shortest Path.

**UNIT - IV****[12 Hrs]**

**Dynamic Programming:** General Method–Multi stage Graphs–All Pair Shortest Path–Optimal Binary Search Trees – 0/1 Knapsacks – Travelling Salesman Problem.

**UNIT - V****[10 Hrs]**

**Backtracking:** General Method–Graph Coloring– Hamiltonian Cycles -The Method – Travelling Salesperson.

**UNIT - VI****[2 Hrs]]**

**CONTEMPORARY ISSUES:** Expert lectures, online seminars – webinars

**Text Books**

1. EllisHorowitz ,“Computer Algorithms”,GalgotiaPublications.
2. Alfred V.Aho,John E .Hopcroft , JeffreyD.Ullman," Data Structures and Algorithms".

**Reference Books**

1. Goodrich,“ Data Structures& Algorithms Java”,Wiley3rd edition.
2. Skiena,,” The Algorithm Design Manual”,SecondEdition,Springer,2008
3. AnanyLevith,,” Introduction to the Design and Analysis of algorithm”,PearsonEducation Asia, 2003
4. Robert Sedgewick, Phillipe Flajolet,,” An Introduction to the Analysis of Algorithms”, Addison-Wesley Publishing Company,1996.

**Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]**

1. <https://nptel.ac.in/courses/106/106/106106131/>
2. [https://www.tutorialspoint.com/design\\_and\\_analysis\\_of\\_algorithms/index.htm](https://www.tutorialspoint.com/design_and_analysis_of_algorithms/index.htm)
3. <https://www.javatpoint.com/daa-tutorial>

I M.Sc(CS)	<b>OBJECT ORIENTED ANALYSIS AND DESIGN &amp; C++</b>	PCS12
SEMESTER – I		HRS/WK – 6
CORE – 2		CREDIT – 4

### Objective:

To enable the students to learn the Software development methods and tools related with Object Oriented Technology.

### Course Outcomes (COs):

After learning this course, the students should be able to expose:

**CO1:** Ability to analyze and overview of object-oriented software development.

**CO2:** Ability to know the object-oriented methodologies and Frameworks.

**CO3:** Present the object model, classes and objects, object orientation, machine view and model management view.

**CO4:** Enables the students to learn the basic functions, principles and concepts of object oriented analysis and design.

**CO5:** Enable the students to understand C++ language with respect to OOAD

### Relationship Matrix Course Outcome, Programme Outcome and Programme Specific Outcome

SEMESTER I	COURSE CODE: PCS12					COURSE TITLE: OBJECT ORIENTED ANALYSIS AND DESIGN WITH C++					HOURS: 6	CREDITS: 4
COURSE OUTCOME	PROGRAMME OUTCOME(PO)					PROGRAMME SPECIFIC OUTCOME(PSO)					MEAN SCORE OF CO	
	PO 1	PO 2	PO 3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	4	4	5	5	4	4	4	4	4	3	4.1	
CO2	4	4	3	4	3	4	4	3	3	4	3.6	
CO3	4	4	3	3	4	4	4	3	4	4	3.7	
CO4	4	4	3	3	3	4	4	3	4	4	3.6	
CO5	4	4	3	3	3	4	4	3	4	4	3.6	
Mean Overall Score											3.7	

**Result: The Score of this Course is 3.7(High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **High** association with Programme Outcome and Programme Specific Outcome.

## **UNIT - I**

[ 12 Hrs]

**OBJECT MODEL:** The Object Model: The Evolution of the Object Model – Elements of the Object Model – Applying the Object Model. Classes and Objects: The Nature of an Object – Relationship among Objects.

## **UNIT - II**

[12 Hrs]

**CLASSES AND OBJECTS :** Classes and Object: Nature of Class – Relationship Among classes – The Interplay of classes and Objects. Classification: The importance of Proper Classification – identifying classes and objects –Key Abstractions and Mechanism.

## **UNIT - III**

[12 Hrs]

**C++ INTRODUCTION:** Introduction to C++ - Input and output statements in C++ - Declarations – control structures – Functions in C++.

## **UNIT - IV**

[12 Hrs]

**INHERITANCE AND OVERLOADING:** Classes and Objects – Constructors and Destructors – operators overloading – Type Conversion- Inheritance – Pointers and Arrays.

## **UNIT - V**

[10 Hrs]

**POLYMORPHISM AND FILES:** Memory Management Operators – Polymorphism – Files–Exception Handling – String Handling.

## **UNIT - VI**

[ 2 Hrs]

**CONTEMPORARY ISSUES:** Expert lectures, online seminars – webinars

### **Text Books:**

1. “Object Oriented Analysis and Design with Applications”, Grady Booch, Second Edition, Pearson Education.
2. “Object-Oriented Programming with ANSI & Turbo C++”, Ashok N. Kamthane, First Indian Print - 2003, Pearson Education.

### **Reference Book:**

1. Balagurusamy “Object Oriented Programming with C++”, TMH, Second Edition, 2003.

**Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]**

1. [https://onlinecourses.nptel.ac.in/noc19\\_cs48/preview](https://onlinecourses.nptel.ac.in/noc19_cs48/preview)
2. <https://nptel.ac.in/noc/courses/noc16/SEM2/noc16-cs19/>
3. [https://www.tutorialspoint.com/object\\_oriented\\_analysis\\_design.htm](https://www.tutorialspoint.com/object_oriented_analysis_design.htm)

I-MSC (CS)	<b>PYTHON PROGRAMMING</b>	PCS13
SEMESTER – I		HRS/WK – 4
CORE – 3		CREDIT –3

**Objective:**

The course introduces students to learn fundamentals of Python Programming and have an understanding of Python and its various Programming constructs.

*Course Outcomes (COs):*

- CO1:** To Learn the introduction and Features of Python
- CO2.** Learn the Basic control statements and exceptions
- CO3.** Learn about the modules ,class,inheritance in Python
- CO4.** Acquired an idea about storing and retrieving data and also web service in Python
- CO5.** Understand systems,concurrency,networks

**Relationship Matrix Course Outcome, Programme Outcome and Programme Specific outcome**

SEMESTER I	COURSE CODE: PCS13					COURSE TITLE: PYTHON PROGRAMMING					HOURS: 4	CREDITS: 3
COURSE OUTCOME	PROGRAMME OUTCOME(PO)					PROGRAMME SPECIFIC OUTCOME(PSO)					MEAN SCORE OF CO	
	PO1	PO2	PO3	PO4	PO5	PSO 1	PSO2	PSO 3	PSO4	PSO 5		
CO1	4	4	5	5	4	4	4	4	3	3	4.0	
CO2	4	4	3	4	4	4	4	3	3	4	3.7	
CO3	4	4	3	3	4	4	4	3	4	4	3.9	
CO4	4	4	3	3	4	4	4	3	4	4	3.7	
CO5	4	3	4	4	3	4	4	3	4	4	3.7	
Mean Overall Score											3.8	

**Result: The Score of this Course is 3.8(High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **High** association with Programme Outcome and Programme Specific Outcome



**UNIT:1**

[12 Hrs]

**INTRODUCTION:**Python:Introduction–Numbers–Strings–Variables–Lists–Tuples–Dictionaries–Sets

**UNIT:II**

[12 Hrs]

**CODE STRUCTURES:** if, elif, and else – Repeat with while – Iterate with for – Comprehensions – Functions – Namespaces and Scope – Handle Errors with try and except

**UNIT:III**

[12 Hrs]

**MODULES,PACKAGES AND CLASSES :** **Modules, Packages, and Programs:** Stand alone Programs – Command-Line Arguments – Modules and the import Statement – The Python Standard Library. **Objects and Classes:** Define a Class with class – Inheritance – Override a Method – Add a Method –Get and Set Attribute Values with Properties – Method Types

**UNIT:IV**

[12 Hrs]

**DATA TYPES AND WEB :** **Data Types:** Text Strings–Binary Data. **Storing and Retrieving Data:** File Input/Output– Structured Text Files – Structured Binary Files **Web:** Web Clients –Web Servers.

**UNIT:V**

[10 Hrs]

**SYSTEMS AND NETWORKS :** **Systems:** Files–Directories–Programs and Processes–Calendars and Clocks.

**Concurrency:** Queues– Processes–Threads–Green Threads –Redis.

**Networks:** Patterns – The Publish-Subscribe Model – TCP/IP – Sockets –Internet Services – Remote Processing .

**UNIT:VI**

[ 2 Hrs]

Expert lectures, online seminars –webinars

**Text Books:**

1. Bill Lubanovic, “Introducing Python”, O’Reilly, First Edition-Second Release, 2014.
2. Mark Lutz, “Learning Python”, O’Reilly, Fifth Edition, 2013.

**Reference Books:**

1. David M. Beazley, “Python Essential Reference”, Developer’s Library, Fourth Edition, 2009.
2. Sheetal Taneja, Naveen Kumar, “Python Programming-A Modular Approach”, Pearson Publications.

**Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]**

<https://www.programiz.com/python-programming/>

<https://www.tutorialspoint.com/python/index.htm>

[https://onlinecourses.swayam2.ac.in/aic20\\_sp33/preview](https://onlinecourses.swayam2.ac.in/aic20_sp33/preview)

I M.Sc (CS)	<b>ADVANCED SOFTWARE ENGINEERING</b>	EPCS14
SEMESTER – I		HRS/WK-5
Elective – I		CREDIT – 3

**Objectives:**

1. To introduce the concepts of software Engineering and the various phases in Software development in order to equip the students in developing project..
2. Enable the students to learn the concepts of Software Project Management & Software Testing.

**COURSE OUTCOME(COs):**

After learning this course, the students should be able to expose

CO1: Ability to understand about Software Engineering process

CO2: Ability to understand Requirement Engineering and Requirement Engineering Process.

CO3: Ability to understand Software Prototyping and Building Analysis Models.

CO4: Ability to know the Software project management Spectrum and Technical Reviews.

CO5: Ability to learn Ability to know the Testing strategies

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER I	COURSE CODE: EPCS14					TITLE OF THE PAPER:Advanced Software Engineering					HOURS: 5	CREDITS: 3
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)					MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	4	4	4	3	4	3	3	3	4	4	3.6	
CO2	4	4	3	3	4	4	4	4	4	3	3.7	
CO3	4	4	3	4	4	4	4	3	3	3	3.6	
CO4	4	4	3	4	4	4	4	3	4	4	3.8	
CO5	4	4	3	4	4	4	4	3	3	4	3.7	
Mean Overall Score											3.7	

**Result: The Score of this Course is 3.7(High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **High** association with Programme Outcome and Programme specific Outcome

**Unit-I:****[12 Hrs]**

**Introduction:** The Problem Domain – Software Engineering Challenges –Software Myths- Software Engineering Approach – Software Processes: Software Process – Characteristics of a Software Process – Software Development Process Models.

**Unit-II:****[12 Hrs]**

**Software Requirements Analysis and Specification:** Requirement engineering – Type of Requirements – Feasibility Studies – Requirements Elicitation - Requirement Validation – Requirement Management- Requirement Engineering Tasks - Initiating the Requirements Engineering Process.

**Unit-III:****[12 Hrs]**

**Software Prototyping:** Proto-typing in software Process -Rapid Prototyping Techniques-User interface Prototyping. **Building Analysis Model:** Requirement Analysis Model- Data Modeling – Flow Oriented Modeling– Class Based Modeling – Creating a Behavioral Model.

**Unit-IV:****[ 12 Hrs]**

**Software Project Management:** Responsibilities of a software project manager – Project planning –The Management Spectrum: People, Project, Product, Process– Project Estimation Techniques –Formal Technical Reviews

**Unit-V:****[10 Hrs]**

**Testing:** Introduction about testing: Testing ,Generic characteristics of testing, verification and Validation - Test Strategies for Conventional Software: Unit Testing, Integration Testing: Top-down Integration, Bottom-up Integration - Validation Testing – System Testing –White Box Testing – Basic Path testing : Flow Graph Notation, Independent paths, Cyclomatic Complexity, Graph matrices method – Control Structure – Black Box Testing: Graph-Based Testing Methods , Equivalence Partitioning, Boundary Value Analysis, Orthogonal Array Testing.

**UNIT - VI****[2 Hrs]**

**CONTEMPORARY ISSUES:** Expert lectures, online seminars – webinars

**Text Books:**

1. An Integrated Approach to Software Engineering – Pankaj Jalote, Narosa Publishing House, Delhi, 3rd Edition.
2. Fundamentals of Software Engineering – Rajib Mall, PHI Publication, 3rd Edition
3. A Practitioners Approach-Software Engineering, - R.S. Pressman, McGraw Hill

**Reference Books:**

1. Software Engineering – K.K. Aggarwal and Yogesh Singh, New Age International Publishers, 3rd edition.
2. Fundamentals of Software Engineering – Carlo Ghezzi, M. Jarayeri, D. Manodrioli, PHI Publication.

I M.Sc (C.S)	<b>INTERNET OF THINGS</b>	EPCS15
SEMESTER –I		HRS/WK-5
ELECTIVE -2		CREDIT-3

### Objectives:

1. About Internet of Things where various communicating entities are controlled and managed for decision making in the application domain.
2. Enable students to learn the Architecture of IoT and IoT Technologies
3. Developing IoT applications and Security in IoT, Basic Electronics for IoT, ArduinoIDE, Sensors and Actuators Programming NODEMCU using Arduino IDE.

### Course Outcomes (COs):

- CO1:** Understand about IoT, its Architecture and its Applications  
**CO2.** Understand basic electronics used in IoT & its role  
**CO3.** Develop applications with C using Arduino IDE  
**CO4.** Analyze about sensors and actuators  
**CO5.** Design IoT in realtime applications using today's internet & wireless technologies

### Relationship Matrix Course Outcome, Programme Outcome and Programme Specific Outcome

SEMESTER I	COURSE CODE: EPCS15					COURSE TITLE: INTERNET OF THINGS					HOURS: 5	CREDITS: 34
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)					MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	3	3	4	4	3	4	4	3	4	4	3.6	
CO2	4	4	4	4	4	3	4	3	3	4	3.7	
CO3	4	4	3	3	4	4	4	3	4	4	3.7	
CO4	4	4	3	3	4	4	3	4	4	3	3.6	
CO5	4	4	4	3	3	4	4	4	4	4	3.8	
Mean Overall Score											3.7	

**Result: The Score of this Course is 3.7(High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **High** association with Programme Outcome and Programme Specific Outcome

## **UNIT-I INTRODUCTION**

[ 12 Hrs]

Introduction to IoT: Evolution of IoT – Definition & Characteristics of IoT - Architecture of IoT– Technologies for IoT – Developing IoT Applications – Applications of IoT – Industrial IoT – Security in IoT

## **UNIT-II BASIC ELECTRONICS FOR IoT**

[ 12 Hrs]

Basic Electronics for IoT: Binary Calculations– Logic Chips –Microcontrollers – Multipurpose Computers – Electronic Signals – A/D and D/A Conversion – Pulse Width Modulation.

## **UNIT-III PROGRAMMING USING ARDUINO**

[ 12 Hrs]

Programming Fundamentals with C using Arduino IDE: – Basic Syntax – Data Types/ Variables/ Constant – Operators – Conditional Statements and Loops– Strings and Mathematics Library Functions.

## **UNIT-IV SENSORS AND ACTUATORS**

[ 10 Hrs]

Sensors and Actuators: Analog and Digital Sensors–Interfacing temperature sensor, ultrasound Sensor and infrared (IR) sensor with Arduino– Interfacing LED and Buzzer with Arduino.

## **UNIT-V SENSOR DATA IN INTERNET**

[ 12 Hrs]

Sending Sensor Data Over Internet: Introduction to ESP8266 NODEMCU WiFi Module –Using WiFi and NODEMCU to transmit data from temperature sensor to Open Source IoT cloud platform (Thing Speak).

## **Unit: VI CONTEMPORARY ISSUES**

[ 2 Hrs]

Expert lectures, online seminars –webinars

### **Text Books:**

1. Arshdeep Bahga, Vijay Madiseti, “Internet of Things: A Hands-On Approach”, 2014.  
ISBN: 978-0996025515

### **Reference Books:**

1. Anany Levith, ” Introduction to the Design and Analysis of algorithm”, Pearson Education Asia, 2003
2. Robert Sedgewick, Phillippe Flajolet, ” An Introduction to the Analysis of Algorithms”, Addison-Wesley Publishing Company, 1996.

### **Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]**

1. [https://onlinecourses.nptel.ac.in/noc19\\_cs48/preview](https://onlinecourses.nptel.ac.in/noc19_cs48/preview)
2. <https://nptel.ac.in/noc/courses/noc16/SEM2/noc16-cs19/>
3. [https://www.tutorialspoint.com/object\\_oriented\\_analysis\\_design/ooad\\_object\\_oriented\\_analysis.htm](https://www.tutorialspoint.com/object_oriented_analysis_design/ooad_object_oriented_analysis.htm)

I M.Sc (CS)	<b>ALGORITHM AND OOPS LAB</b>	PCSP11A
SEMESTER – I		HRS/WK – 3
CORE– PRACTICAL-I		CREDIT – 2

### Objectives:

The main objectives of this course are to learn fundamentals of C++ Programming and have an understanding of Algorithm and its various Programming constructs.

### Course Outcomes (COs):

**CO1:** To provide a sound understanding of the basic concepts of OOPs data structures like Stack, Queue, Tree, List.

**CO2:** To provide a sound understanding of the basic concepts of OOPs.

**CO3:** To equip the students with the knowledge of classes and objects

**CO4:** To understand the core concepts of Constructor and Inheritance

**CO5:** Ability to learn the concept of functions and Operator overloading

### Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes

SEMESTER I	COURSE CODE: PCSP11A					COURSE TITLE: ALGORITHM AND OOPS LAB					HOURS: 3	CREDITS: 2
COURSE OUTCOME	PROGRAMME OUTCOME(PO)					PROGRAMME SPECIFIC OUTCOME(PSO)					MEAN SCORE OF CO'S	
	PO 1	PO 2	PO 3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	3	3	2	2	4	4	4	3	3	3	3.1	
CO2	3	4	3	4	3	4	3	3	3	4	3.5	
CO3	3	3	3	3	3	4	4	3	4	3	3.4	
CO4	3	3	3	3	4	4	4	3	4	4	3.5	
CO5	2	3	3	3	2	4	3	3	4	3	3.2	
Mean Overall Score											3.3	

**Result: The Score of this Course is 3.3(High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **High** association with Programme Outcome and Programme Specific Outcome.



## **PRACTICAL-I ALGORITHM AND OOPS LAB**

- 1) Write a program to solve the tower of Hanoi using recursion.
- 2) Write a program to traverse through binary search tree using traversals.
- 3) Write a program to sort an array of an elements using quick sort.
- 4) Write a program to solve number of elements in ascending order using heap sort.
- 5) Write a program to solve the knapsack problem using greedy method.
- 6) Write a program to search for an element in a tree using divide & conquer strategy.
- 7) Write a C++ program to perform Parameterized constructor
- 8) Write a C++ program to perform Friend Function.
- 9) Write a C++ program to perform Single Inheritance.
- 10) Write a C++ program to perform Employee Details using files.

### **Text Books:**

1. Goodrich, “ Data Structures & Algorithms in Java ”,Wiley3rd edition.
2. Skiena,”The Algorithm Design Manual”,Second Edition,Springer,2008
3. Sheetal Taneja, Naveen Kumar, ”Python Programming-A Modular Approach”,Pearson Publications.

### **Related Online Contents[MOOC, SWAYAM, NPTEL, Websites etc.]**

1. <https://www.programiz.com/python-programming/>
2. <https://www.tutorialspoint.com/python/index.htm>
3. [https://onlinecourses.swayam2.ac.in/aic20\\_sp33/preview](https://onlinecourses.swayam2.ac.in/aic20_sp33/preview)

I-MSC (CS)	<b>PYTHON PROGRAMMING</b>	PCSP12A
SEMESTER – I		HRS/WK –3
CORE PRACTICAL-2		CREDIT – 2

*Objective:*

The course introduces students to learn fundamentals of Python Programming and have an understanding of Python and its various Programming constructs.

*Course Outcomes (COs):*

- CO1: To Learn the Simple programs of Python
- CO2. Learn the Basic Loops and function of Python
- CO3. Learn about the Exception and inheritance in Python
- CO4. Acquired an idea about polymorphism and file operations in Python
- CO5. Understood the modules

**Relationship Matrix Course Outcome, Programme Outcome and Programme Specific outcome**

SEMESTER I	COURSE CODE: PCSP12A	COURSE TITLE: PYTHON PROGRAMMING					HOURS:3	CREDITS:2			
COURSE OUTCOME	PROGRAMME OUTCOME(PO)					PROGRAMME SPECIFIC OUTCOME(PSO)					MEAN SCORE OF CO
	P O 2	P O 3	P O 4	P O 5		PS O1	PS O2	PS O3	PS O4	PS O5	
CO1	4	5	5	4		4	4	4	3	3	4.0
CO2	4	3	4	4		4	4	3	3	4	3.7
CO3	4	3	3	4		4	4	3	4	4	3.9
CO4	4	3	3	4		4	4	3	4	4	3.7
CO5	3	4	4	3		4	4	3	4	4	3.7
<b>Mean Overall Score</b>											3.8

**Result: The Score of this Course is 3.8(High)**

This Course is having **High** association with Programme Outcome and Programme Specific Outcome

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

## **PRACTICAL II: PYTHON PROGRAMMING LAB**

1. Programs using elementary data items, lists, dictionaries and tuples.
2. Programs using conditional branches,
3. Programs using loops.
4. Programs using functions.
5. Programs using exception handling.
6. Programs using inheritance.
7. Programs using polymorphism.
8. Programs to implement file operations.
9. Programs using modules

### **Text Books:**

1. Bill Lubanovic, "Introducing Python", O'Reilly, First Edition-Second Release, 2014.
- . Mark Lutz, "Learning Python", O'Reilly, Fifth Edition, 2013.

### **Reference Books:**

1. David M. Beazley, "Python Essential Reference", Developer's Library, Fourth Edition, 2009.

I M.Sc.(CS)	<b>ADVANCED JAVA PROGRAMMING</b>	PCS807A
SEMESTER – II		HRS/WK – 4
CORE – 6		CREDIT – 4

**Objectives:**

1. This course provides an in-depth knowledge of Advanced Java language and programming.
2. Implementing Java components
3. Practicing RMI, JDBC
4. Ability to understand Multithreading

**Course Outcomes (COs):**

After learning this course, the students should be able to expose

**CO1:** Ability to gain knowledge on fundamentals of java and clear view on Object and Classes.

**CO2:** Ability to apply knowledge on problems exhibiting packages, Interfaces, Exceptions, Multithreading

**CO3:** Ability to connect to database and working with AWT

**CO4:** Ability to access networks and to work with TCP/IP and UDP

**CO5:** Ability to apply basic Servlets and RMI methods.

**Relationship Matrix Course Outcome, Programme Outcome and Programme Specific Outcome**

SEMESTER I	COURSE CODE: PCS807A					COURSE TITLE: ADVANCED JAVA PROGRAMMING					HOUR S:4	CREDITS: 4
COURSE OUTCOME	PROGRAMME OUTCOME(PO)					PROGRAMME SPECIFIC OUTCOME(PSO)					MEAN SCORE OF CO	
	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	3.5	
CO1	2	3	3	4	4	4	4	4	3	4	3.5	
CO2	3	4	3	4	3	4	4	3	3	4	3.5	
CO3	4	4	3	3	4	4	4	3	4	4	3.7	
CO4	4	4	3	3	3	5	5	3	4	4	3.8	
CO5	4	4	3	3	3	5	4	3	4	4	3.7	
Mean Overall Score											3.6	

**Result: The Score of this Course is 3.6(High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **High** association with Programme Outcome and Programme Specific Outcomes

**UNIT- I****[12Hrs]**

**INTRODUCTION TO JAVA:** Features of Java - Data types – Variables –Operators - Arrays – Classes – Objects – Constructors - Overloading method - String class – Inheritance - Overriding Method – Using super - Abstract class - Packages – Access protection.

**UNIT-II****[13Hrs]**

**MULTITHREADING:** Packages - Access protection- Importing packages – Interfaces – Exception handling –Throw and throws - Thread – Multithreading.

**UNIT-III****[12 Hrs]**

**JAVA DATABASE:** Java Database-Working with windows using AWT Classes – AWT Controls – Layout Managers and menus- Swing- Introduction to Swing- Swing Architecture- Examples for Swing-JDBC/ODBC driver-MSACCESS connection-A complete example

**UNIT-IV****[11Hrs]**

**NETWORKING:** Sockets - Inet Address - IP Address - Port number - Client/Server computing - TCP/IP - TCP client – server handling multiple clients -UDP-UDP Server-UDP Client-Multithreaded clients

**UNIT- V****[12Hrs]**

**SERVLETS AND RMI:** Servlet architecture-HTML support - Servlet Installation - Servlet API Distributed computing – RMI architecture - parameter in RMI - RMI Client-side callbacks - Installing RMI systems - serializing remote objects.

**Text Books:**

1. “Advanced Java Programming”, Jeffrey C. Rice, Irving Salisbury-McGraw Hill-1997.
2. “JAVA: How to program”, Paul J. Deitel, Harvey Deitel, Prentice Hall publication, tenth edition, 2014.

**Reference Book:**

1. “JAVA: Complete reference” ,Herbert Schildt, McGraw Hill ,Ninth Edition,2017

I M.Sc(CS)	<b>ADVANCED JAVA PROGRAMMING</b>	PCSP23
SEMESTER – II		HRS/WK – 5
CORE PRACTICAL – III		CREDIT – 3

### Objectives:

1. This provides an in-depth knowledge of Advanced Java language and programming
2. Gain an in-depth understanding of database programming in Java using JDBC.
3. Learn how to do distributed programming in Java using RMI and CORBA.

### Course Outcomes (COs):

- CO1:** Ability to work with different input getting parameters  
**CO2:** Ability to handle problems using Thread concepts.  
**CO3:** Ability to access Network classes and its methods  
**CO4:** Ability to work with database with different commands  
**CO5:** Ability to handle AWT methods and event handlings & implementing RMI Concepts

### Relationship Matrix Course Outcome, Programme Outcome and Programme Specific Outcome

SEMESTER I	COURSE CODE: PCSP101T					COURSE TITLE: Practical- ADVANCED JAVA PROGRAMMING					HOURS: 5	CREDITS: 3
COURSE OUTCOME	PROGRAMME OUTCOME(PO)					PROGRAMME SPECIFIC OUTCOME(PSO)					MEAN SCORE OF CO	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	4	3	2	3	4	4	4	3	3	3	3.3	
CO2	4	4	2	3	4	3	4	5	3	4	3.6	
CO3	4	3	2	4	4	2	4	2	4	4	3.3	
CO4	4	2	2	2	4	4	4	4	4	4	3.6	
CO5	4	4	2	3	4	3	4	3	4	3	3.4	
Mean Overall Score											3.4	

**Result: The Score of this Course is 3.4(High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **High** association with Programme Outcome and Programme Specific Outcome

## ADVANCED JAVA PROGRAMMING PRACTICAL

1. Write a java program to find area perimeter using Buffered Reader class.
2. Write a java program to implement Multithreading concepts.
3. Write a java program to implement an application for File Stream using Sequential file.
4. Write a program to print the port, protocol, host, and file name from the given URL.
5. Write a program to implement Client and Server application using TCP/IP.
6. Write a program to display the IP Address of a given Host Machine.
7. Write a program for Remote Command Execution using TCP/IP.
8. Write a program for Storing and Retrieving Email Addresses using JDBC.
9. Write a program to print student details using JDBC.
10. Working with Frames and Various Controls.
11. Incorporating Graphics
12. Font animation using Applets Interface.
13. Write a program to implement addition operation using RMI.

### Web References:

1. <https://www.codewithc.com/category/java-tutorials>  
<https://www.codewithc.com/category/projects/java-projects>

<b>I B.Sc (CS)</b>	<b>PYTHON PROGRAMMING</b>	<b>CS101A</b>
<b>SEMESTER – I</b>		<b>HRS/WK-6</b>
<b>CORE – I</b>		<b>CREDIT – 5</b>

**Objective:**

To understand the basic concepts of a Python Language and its Programming skills.

**COURSE OUTCOMES (CO):**

**CO1:** To make students understand the concepts of Python programming.

**CO2:** To know the flow of various control structures.

**CO3:** To have familiarity with function calling mechanism and string functions.

**CO4:** Determine the methods to create and manipulate Python programs by utilizing lists, dictionaries and tuples.

**CO5:** Identifying the commonly used operations involving file system.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER I	COURSE CODE: CS101S					TITLE OF THE PAPER: PYTHON PROGRAMMING					HOURS : 4	CREDITS: 3
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)					MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	3	3	4	4	3	4	4	3	4	4	3.6	
CO2	4	4	4	4	4	3	4	3	3	4	3.7	
CO3	4	4	3	3	4	4	4	3	4	4	3.7	
CO4	4	4	3	3	4	4	3	3	4	3	3.5	
CO5	4	3	4	3	3	4	4	4	4	4	3.7	
Mean Overall Score											3.6	

**Result: The Score of this Course is 3.6(High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **High** association with Programme Outcome and Programme Specific Outcome



## UNIT – I

**Basics of Python Programming:** History of Python-Features of Python-Literal-Constants-Variables - Identifiers–Keywords-Built-in Data Types-Output Statements – Input Statements-Comments – Operators-Expressions-Type conversions. **Python Arrays:** Defining and Processing Arrays – Array methods.

## UNIT – II

**Control Statements:** Selection/Conditional Branching statements: if, if-else, nested if and if-elif-else statements. Iterative Statements: while loop, for loop. **Jump Statements:** break, continue and pass statements.

## UNIT – III

**Functions:** Function Definition – Function Call – Variable Scope and its Lifetime-Return Statement. **Function Arguments:** Required Arguments, Keyword Arguments, Default Arguments and Variable Length Arguments- Recursion. **Python Strings:** String operations- Immutable Strings - Built-in String Methods and Functions - String Comparison.

## UNIT – IV

**Lists:** Creating a list -Access values in List-Updating values in Lists-Nested lists - Basic list operations-List Methods. **Tuples:** Creating, Accessing, Updating and Deleting Elements in a tuple – Nested tuples– Difference between lists and tuples. **Dictionaries:** Creating, Accessing, Updating and Deleting Elements in a Dictionary – Dictionary Functions and Methods - Difference between Lists and Dictionaries.

## UNIT – V

**Python File Handling:** Types of files in Python - Opening and Closing files-Reading and Writing files: write() and writelines() methods- append() method – read() and readlines() methods – with keyword – File methods - File Positions- Renaming and deleting files.

### Textbooks

1. Reema Thareja, “Python Programming using problem solving approach”, First Edition, 2017, Oxford University Press.
2. Dr. R. Nageswara Rao, “Core Python Programming”, First Edition, 2017, Dream tech Publishers.

### Reference Books

1. VamsiKurama, “Python Programming: A Modern Approach”, Pearson Education.
2. Mark Lutz, ”Learning Python”, Orielly.
3. Adam Stewarts, “Python Programming”, Online.

<b>I B.Sc(CS)</b>	<b>PRACTICAL- PYTHON PROGRAMMING</b> <b>For the students admitted in the year2023</b>	<b>CSP101A</b>
<b>SEMESTER – I</b>		<b>HRS/WK-3</b>
<b>CORE– Practical -I</b>		<b>CREDIT – 2</b>

**Objective:**

To unleash the Programming skills in Python Language and Logic building capabilities.

**COURSE OUTCOMES:**

**CO1:** Be able to design and program Python applications.

**CO2:** Be able to create loops and decision statements in Python.

**CO3:** Be able to work with functions and pass arguments in Python.

**CO4:** Be able to build and package Python modules for reusability.

**CO5:** Be able to read and write files in Python.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER I	COURSE CODE: CSP101A					TITLE OF THE PAPER: Practical-Python Programming					HOURS: 3	CREDITS: 2
COURSE OUTCOME S	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)					MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	3	4	3	3	3	4	4	3	4	3	3.4	
CO2	4	4	3	4	3	4	3	4	4	3	3.6	
CO3	4	4	3	3	3	3	4	3	4	4	3.5	
CO4	3	4	3	3	3	3	3	4	4	4	3.4	
CO5	4	4	3	3	3	4	4	3	3	4	3.5	
<b>Mean overall Score</b>											<b>3.5</b>	

**Result: The Score of this Course is 3.5(High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **High** association with Programme Outcome and Programme specific Outcome.

## **PRACTICAL - PYTHON PROGRAMMING**

1. Program using variables, constants, I/O statements in Python.
2. Program using Operators in Python.
3. Program using Conditional Statements.
4. Program using Loops.
5. Program using Functions.
6. Program using Arrays.
7. Program using Strings.
8. Program using Lists.
9. Program using Dictionaries.
10. Program for File Handling.

<b>I B.Sc (CS)</b>	<b>PROBLEM SOLVING TECHNIQUES</b>	<b>FCS101</b>
<b>SEMESTER – I</b>		<b>HRS/WK 2</b>
<b>Foundation Course</b>		<b>CREDIT 2</b>

**Objective:**

To make the student get exposed with the basic knowledge of computers, problem solving techniques and to equip them with skill to illustrate program modules.

**Course Outcomes (COs):**

**CO1:** Study the basic knowledge of computers & analyze the programming languages.

**CO2:** Study the data types and arithmetic operations. Know about the algorithms; develop program using flow chart and pseudocode.

**CO3:** Determine the various operators, explain about the structures and illustrate the concept of loops.

**CO4:** Study about Numeric data and character-based data, analyze about arrays.

**CO5:** Explain about DFD Illustrate program modules, creating and reading files.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER I	COURSECODE: FCS101					COURSE TITLE: PROBLEM SOLVING TECHNIQUES					HOURS: 2	CREDITS:2
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)					MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	3	3	3	4	4	4	4	3	4	4	3.6	
CO2	3	4	3	4	4	4	4	3	3	4	3.6	
CO3	4	3	4	4	3	3	4	3	3	4	3.5	
CO4	3	4	3	4	3	4	4	3	4	4	3.6	
CO5	3	4	3	4	3	3	3	4	3	4	3.4	
Mean Overall Score											3.5	

**Result: The Score of this Course is 3.5(High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having High association with Programme Outcome and Programme Specific Outcome.

## UNIT I:

Introduction: History, characteristics of Computer. Hardware/Anatomy of Computer- Input Devices and Output devices. Types of Computers: Minicomputer, Main frame and Supercomputer. Software: System software and Application software. Programming Languages: Machine language, Assembly language, High-level language. Translators: Interpreters and Compilers.

## UNIT II:

**Data:** Data types-Processing of data-Arithmetic Operators, Hierarchy of operations. Different phases in Program Development Cycle (PDC).**Flowcharts:** Advantages and limitations of flowcharts, when to use flowcharts, flowchart symbols and types of flowcharts. **Pseudocode:** Writing a pseudocode. Testing a program: Comment lines and types of errors

## UNIT III:

**Selection Structures:** Relational and Logical Operators - Selecting from Several Alternatives – Applications of Selection Structures. **Repetition Structures:** Counter Controlled Loops–Nested Loops– Applications of Repetition Structures.

## UNIT IV:

**Data:** Numeric Data and Character Based Data. **Arrays:** One Dimensional Array - Two Dimensional Arrays – Strings as Array of Characters.

## UNIT V:

**Data Flow Diagrams:** Definition, DFD symbols and types of DFDs. **Program Modules:** Subprograms-Value and Reference parameters- Scope of a variable - Functions – Recursion. **Files:** File Basics-Creating and reading a sequential file.

## Textbooks:

- 1) **Stewart Venit**, “Introduction to Programming: Concepts and Design”, Fourth Edition, 2010, DreamTech Publishers.

## Web Resources:

- 1) <https://www.codesansar.com/computer-basics/problem-solving-using-computer.htm>
- 2) <http://www.nptel.iitm.ac.in/video.php?subjectId=106102067>
- 3) [http://utubersity.com/?page\\_id=876](http://utubersity.com/?page_id=876)

<b>I B.Sc (CS)</b>	<b>OFFICE AUTOMATION</b>	<b>NCS101</b>
<b>SEMESTER – I</b>		<b>HRS/WK-2</b>
<b>SKILL ENHANCEMENT COURSE (SEC)</b>		<b>CREDIT – 2</b>

**Objective:**

The major objective in introducing the Computer Skills Course is to impart training for students in Microsoft Office which has different components like MS Word, MS Excel, and PowerPoint

**Course Outcomes(COs):**

**CO1:** Understand the basics of computer systems and its components.

**CO2:** Understand and apply the basic concepts of a word processing package.

**CO3:** Understand and apply the basic concepts of electronic spread sheet software.

**CO4:** Understand and apply the basic concepts of database management system.

**CO5:** Understand and create a presentation using Power Point tool.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER I	COURSE CODE: NCS101					COURSE TITLE: OFFICE AUTOMATION					HOURS: 2	CREDITS: 2
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)					MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	3	3	4	4	3	4	4	3	4	4	3.6	
CO2	4	4	4	4	4	3	4	3	3	4	3.7	
CO3	4	4	3	3	4	4	4	3	4	4	3.7	
CO4	4	4	3	3	4	4	3	3	4	3	3.5	
CO5	4	3	4	3	3	4	4	4	4	4	3.7	
<b>Mean Overall Score</b>											3.6	

**Result: The Score of this Course is 3.6(High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
<b>Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Interval</b>	<b>0&lt;=rating&lt;=1</b>	<b>1.1&lt;=rating&lt;=2</b>	<b>2.1&lt;=rating&lt;=3</b>	<b>3.1&lt;=rating&lt;=4</b>	<b>4.1&lt;=rating&lt;=5</b>
<b>Rating</b>	<b>Very Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>High</b>	<b>Very High</b>

This Course is having **High** association with Programme Outcome and Programme Specific Outcome

## **UNIT –I**

**[6 hrs]**

**Introductory Concepts:** Memory unit– CPU-Input Devices: Key board, Mouse and Scanner. Output devices: Monitor, Printer. Introduction to Operating Systems :DOS– UNIX–Windows .

## **UNIT–II**

**[6 hrs]**

**Word Processing:** Open, Save and close word document; Editing text – tools, formatting, bullets; Spell Checker - Document formatting – Paragraph alignment, headers and footers, numbering; printing

## **UNIT–III**

**[6 hrs]**

**Spreadsheets:** Excel–opening, entering text and data, formatting, Formulas–entering, handling and copying; Charts–creating, formatting

## **UNIT–IV**

**[6 hrs]**

**Database Concepts:** The concept of data base management system; Data field, records, and files, Sorting and indexing data; Searching records. Designing queries

## **UNIT–V**

**[6 hrs]**

**Power point:** Introduction to Power point - Features – Understanding slide typecasting & viewing slides – creating slide shows. including objects & pictures – Slide transition– Animation effects

### **Text Books:**

1. PeterNorton, “Introduction to Computers”–Tata McGraw-Hill.

### **Reference Books:**

1. Jennifer Ackerman Kettel, Guy Hat-Davis, Curt Simmons, “Microsoft 2003”, Tata McGraw Hill.

III B.Sc(CS)	<b>Web Technology – WordPress</b> <b>(Upskilling Course)</b> <b>(for the students admitted in the year 2023-2024)</b>	<b>NEW CODE</b>
<b>SEMESTER – V</b>		<b>HRS/WK-2</b>
<b>PRACTICAL</b>		<b>CREDIT - 2</b>

**Objectives:**

This skill course introduces the fundamentals of web technology and gets practically exposed.

**Course Outcomes (COs):**

- CO1:** Acquire Fundamental knowledge on WordPress.
- CO2:** Learn the Basics of webpage design using WordPress.
- CO3:** Design the web page with various themes and its effects on Website.
- CO4:** Create Website by sharing your images using WordPress.
- CO5:** Develop an idea about displaying the content in the web site.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER V	COURSE CODE:*					COURSE TITLE: Practical – Web Technology – WordPress					HOURS: 2	CREDITS: 2
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)					MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	3	4	3	3	3	4	4	3	4	3	3.4	
CO2	4	4	3	4	3	4	3	4	4	3	3.6	
CO3	4	4	3	3	3	3	4	3	4	4	3.5	
CO4	3	4	3	3	3	3	3	4	4	4	3.4	
CO5	4	4	3	3	3	4	4	3	3	4	3.5	
<b>Mean Overall Score</b>											3.5	

**Result: The Score of this Course is 3.5(High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **High** association with Programme Outcome and Programme Specific Outcome



1. Create a simple Blog by selecting a theme, setting up your pages, and starting to write posts using WordPress.
2. Create E-commerce website and set up the product and displaying the products using WordPress.
3. Create a Portfolio website to showcase your work by selecting a theme, set up your pages, and start displaying your content using WordPress.
4. Create a website for the department Event by selecting a theme using WordPress.
5. Create Job board where employers can post job listings and job seekers can search for jobs using WordPress.
6. Create a Fitness website that provide resources and information on fitness and health using WordPress.
7. Create a technology website that provides technology news, reviews and insights using WordPress.
8. Create Photography website by selecting a theme that's designed for photography, set up your galleries, and start sharing your images using WordPress.
9. Create a Travel website where you can share information about destination ideas using WordPress.
10. Create Educational website that provides resources and learning materials for students using WordPress.

#### **TEXT BOOKS:**

1. WordPress for Beginners 2021: A visual step by step guide to mastering WordPress, Dr Andy Williams 10<sup>th</sup> edition 2021.
2. WordPress for Dummies, Lisa Sabin-Wilson,9<sup>th</sup> edition 2019.
3. WordPress 5 Complete: Build beautiful and feature-rich websites from scratch, Karol Krol 7<sup>th</sup> edition 2019.

#### **REFERENCE BOOKS**

1. WordPress 5 Cookbook: Actionable Solutions to Common Problems when Building Websites with WordPress , Rakhitha Nimesh Ratnayake , 2<sup>nd</sup> edition 2020.
2. WordPress to Go: How to Build a WordPress Website on Your Own Domain, from Scratch, Even If You are a Complete Beginner. Sarah McHarry,2013

<b>I B.C.A</b>	<b>INTRODUCTION TO HTML</b>	<b>NCA101</b>
<b>SEMESTER– I</b>		<b>HRS/WK- 2</b>
<b>SEC-I(NME)</b>		<b>CREDIT - 2</b>

**UNIT-I:** **[6 Hrs]**

Introduction : Web Basics: What is Internet–Web browsers–What is Webpage –HTML  
Basics: Understanding tags.

**UNIT-II:** **[6 Hrs]**

Tags for Document structure (HTML, Head, Body Tag). Block level text elements: Headingsparagraph(<p> tag)– Font style elements: (bold,italic,font,small,strong,strike,bigtags)

**UNIT-III:** **[6 Hrs]**

Lists: Types of lists: Ordered ,Unordered– Nesting Lists–Other tags: Marquee, HR, BR-  
Using Images – Creating Hyperlinks.

**UNIT-IV:** **[6 Hrs]**

Tables: Creating basic Table, Table elements, Caption–Table and cell alignment–Rowspan,  
Colspan– Cell padding.

**UNIT-V:** **[6 Hrs]**

Frames: Frameset– Targeted Links– No frame– Forms: Input, Textarea, Select, Option. Style  
Sheet Basics : Introduction to CSS – Add Style to document –Inline Styles-Embedded Styles-  
External Style sheets

**TEXT BOOK:**

1. “Mastering HTML5 and CSS3 Made Easy”, TeachUComp Inc., 2014.

**REFERENCE BOOK:**

1. Thomas Michaud, “Foundations of Web Design: Introduction to HTML & CSS”

**Web Resources**

1. <https://www.teachucomp.com/samples/html/5/manuals/Mastering-HTML5-CSS3.pdf>
2. <https://www.w3schools.com/html/default.asp>

<b>I B.C.A</b>	<b>STRUCTURED PROGRAMMING LANGUAGES IN C</b>	<b>FCA101</b>
<b>SEMESTER- I</b>		<b>HRS/WK- 2</b>
<b>FC(Foundation Course)</b>		<b>CREDIT - 2</b>

**UNIT-I: [6 Hrs]**

**Overview of C:** Importance of C, sample C program, C program structure, executing C program. Constants, Variables, and Data Types: Character set, C tokens, keywords and identifiers, constants, variables, data types, declaration of variables, Assigning values to variables--- Assignment statement, declaring a variable as constant, as volatile. Operators and Expression.

**UNIT-II: [6 Hrs]**

**Decision Making and Branching:** Decision making with If, simple IF, IF ELSE, nested IF ELSE , ELSE IF ladder, switch, GOTO statement. Decision Making and Looping: While, Do-While, For, Jumps in loops.

**UNIT-III: [6 Hrs]**

**Arrays:** Declaration and accessing of one & two-dimensional arrays, initializing two-dimensional arrays, multidimensional arrays.

**UNIT-IV: [6 Hrs]**

**Functions:** The form of C functions, Return values and types, calling a function, categories of functions, Nested functions, Recursion, functions with arrays, call by value, call by reference, storage classes-character arrays and string functions

**UNIT-V: [6 Hrs]**

Structures and Unions: Structures - passing structures to functions - self-referential structures – Structure as an array – unions

**TEXT BOOK:**

1. E. Balagurusamy, Programming in ANSI C, Fifth Edition, Tata McGraw-Hill, 2010.

**REFERENCE BOOKS:**

1. Byron Gottfried, Schaum’s Outline Programming with C, Fourth Edition, Tata McGraw-Hill, 2018
2. Kernighan and Ritchie, The C Programming Language, Second Edition, Prentice Hall, 1998
3. Yashavant Kanetkar, Let Us C, Eighteenth Edition, BPB Publications, 2021

<b>II B.C.A</b>	<b>PROGRAMMING USING JAVA</b>	<b>CA305B</b>
<b>SEMESTER - III</b>		<b>HRS/WK-5</b>
<b>CORE -4</b>		<b>CREDIT-3</b>

## UNIT – I

[ 15 Hrs]

**Introduction to Java:** Features of Java. Classes and Objects: Class fundamentals-declaring objects-assigning object reference variables-methods-adding method to the class-returning a value-adding a method with parameters. Constructors: default constructor and Parameterized constructors –this keyword. Inheritance: Member access and inheritance- Single inheritance-multilevel inheritance-hierarchy inheritance. Overloading method– Overriding methods– Abstract class.

## UNIT – II

[ 15 Hrs]

**Packages and Interfaces:** Defining a package-Creating& Importing Packages-simple example using packages. Interfaces: Defining an interface – implementing an interfaces-applying interface in multiple inheritance -simple example using interfaces. **Exception Handling:** Exception handling fundamentals-Java built in exceptions- Javaexceptions keyword: Try, Catch, Throws, Throw and Finally.

## UNIT –III

[ 15 Hrs]

**Thread:** Introduction to Thread-Multithread: Creating a thread-Implementing Runnable interface-Extending thread- Creating multiple threads- Methods in threads. **Strings:** String class constructor and methods -StringBuffer class constructor and methods- Simple Example using String and StringBuffer class.

## UNIT - IV

[ 15 Hrs]

**AWT Overview:** AWT Hierarchy -Layouts : Understanding layout managers. AWT classes: Label,Button, TextField, Checkbox, CheckboxGroup, Choice, TextArea. Event Handling: Event handling classes-ActionEvent-ItemEvent -Simple example using AWT. **Applet:** Introduction to two types of Applet-Life Cycle of Applet- Working with Graphics class- The HTML applet tag- Passing parameters to applet-Simple Example using applet.

## UNIT - V

S[ 15 Hrs]

**Networks:** Network Basics-INetAddress class-client Socket Class- Server SocketClass – Simple Example using network concepts. Servlet: Servlet overview-Handling HTTP request and response–Session Tracking Techniques –using Cookie class,Hidden form field,URLrewriting,HTTPSession -Simple Example program using Servlet.

**TEXT BOOK:**

1.H. Schildt – Java 2 (The Complete Reference] – Fourth Edition, TMH 1999.

**REFERENCE BOOKS:**

1. E. Balagurusamy, Programming with JAVA, TMH.

2. Cray S. Horstman, Gray Cornell – Core Java 2 Vol. I and Vol. II – 7th Ed. PHI, 2000.

<b>II B.C.A</b>	<b>JAVA PROGRAMMING</b>	<b>CAP303A</b>
<b>SEMESTER - III</b>		<b>HRS/WK-5</b>
<b>PRACTICAL - III</b>		<b>CREDIT-3</b>

1. Write a Java program to find the area and Perimeter of a circle and rectangle using BufferedReader class.
2. Write a Java program to generate prime numbers using package.
3. Write a Java program for Armstrong number using Interface.
4. Write a Java program to handle any three exception class using Exception handling keywords. Write a Java program to implement two multiplication table using Multithreading.
5. Write a Java program to implement any five methods using String and StringBuffer classes.
6. Write a Java AWT program to implement simple Bio-Data Information using Frame class.
7. Write a Java Applet program to display different any five mathematical graphical symbols using Applet class.
8. Write a Java network program to implement for sending a string from one system to another using TCP/IP.
9. Write a Java servlet program for arithmetic manipulation.

<b>II B.C.A</b>	<b>DIGITAL MARKETING</b>	<b>CA407B</b>
<b>SEMESTER – IV</b>		<b>HRS/WK-4</b>
<b>CORE- 6</b>		<b>CREDIT-3</b>

**UNIT I:** [ 12 Hrs]

**Introduction to Digital Marketing:** Introduction- Digital Marketing- Internet Users – Digital Marketing Strategy - Digital Advertising Market in India - Skills Required in Digital Marketing - Digital Marketing Plan.

**UNIT II:** [ 12 Hrs]

**Display Advertising:** Introduction - Concept of Display Advertising - Types of Display Ads - Buying Models - Display Plan -Targeting - Programmatic Digital Advertising - Analytics Tools - YouTube Advertising.

**UNIT III:** [ 12 Hr]

**Search Engine Advertising:** Introduction -Search Advertising - Ad placement – Ad Ranks - Creating the First Ad Campaign -EnhanceYour Ad Campaign - Performance Reports.

**UNIT IV:** [ 12 Hrs]

**Social Media Marketing:** Introduction - Social Media Marketing Strategies - Facebook Marketing: Facebook for Business - Anatomy of an Ad Campaign - Adverts -Facebook Insights.

**UNIT V:** [ 12 Hrs]

**Search Engine Optimization:** Search Engine- Concept of Search Engine Optimization (SEO) - SEO Phases - On Page Optimization -OffPage Optimisation - Social Media Reach.

**TEXT BOOK:**

1.Seema Gupta,” Digital Marketing”, McGraw Hill Education (India) Private Limited,2018.

**REFERENCE BOOK:**

1.Puneet Bhatia,” Fundamentals of Digital Marketing”, Pearson Publication, 2018. 2.Nitin C Kamat & ChinmayNitin Kamat,” Digital Social Media”, Himalaya Publishing House, 2018.





<b>II B.C.A</b>	<b>PHP PRACTICAL</b>	<b>CAP404A</b>
<b>SEMESTER - IV</b>		<b>HRS/WK-5</b>
<b>PRACTICAL - IV</b>		<b>CREDIT-4</b>

### **Lab Exercises:**

1. Simple Programs (Factorial , prime number, Fibonacci series)
2. String Functions:  
( trim,ltrim,rtrim,strtolower,strtoupper,ucfirst,ucwords,strops,substr,chartocode, strlen,strrev,str\_word\_count,strcmp,strcasecmp)
3. Arrays
4. Functions-Math function:-floor,pow,round,rand,sqrt,max,min,hexdec.  
Date and Time functions:-strtotime,mktime,data\_default\_timezone\_set.
5. Create a Home Page using PHP and validating the form using javascript.
6. Form creation using POST method
7. Database Operations
8. Login form
9. Student mark list creation
10. Electricity bill preparation.

<b>III B.C.A</b>	<b>BIG DATA</b>	<b>GCA52C</b>
<b>SEMESTER - V</b>		<b>HRS/WK-5</b>
<b>GE-I (1)</b>		<b>CREDIT-4</b>

**UNIT- I** **[15 Hrs ]**

**Big Data in the Enterprise:** Search at Scale – Multimedia Content - Sentiment Analysis – Enriching and Contextualizing Data – Data Discovery and Exploratory Analytics – Operational Analytics or Exploratory Analytics – Realizing opportunities from Bid Data – Taming the “Big Data” – New Information Management Paradigm: New Approach to enterprise Information management for Big Data – Implications of Big Data to Enterprise IT  
– Big Data Implications for Industry: Big Data uses cases by Industry Vertical.

**UNIT-II** **[15 Hrs ]**

Scale-Out architecture – Database Workloads – Database Technologies for managing the workloads – Columnar Database - Polyglot persistence: The next generation architecture - Big Data warehouse and analytics – How Hadoop Works – Additional consideration for BDW – Data Quality implications for Big Data.

**UNIT- III** **[15 Hrs ]**

Understanding Data Integration Patterns – Big Data Workload Design Approaches – Map reduce patterns, algorithms and use cases, NoSQL Modeling Techniques.

**UNIT - IV** **[15 Hrs ]**

Challenges in Big Data Analysis – Big Data Analytics Methodology – Analyze and Evaluate Business Usecase – Develop Business Hypotheses – Setting up Big Data Analytics System – Gathering Data with Apache Flume.

**UNIT -V** **[15 Hrs ]**

In-Memory Computing Technology: Guidelines – Real Time Analytics and CAP Theorem – Hadoop and NoSQL Conundrum – Using an In-Memory Data Grid for Real time Data Analysis – Map Reduce and real Time Processing – Big Data Workflow – Design Principles for Contextualizing Big Data.

**TEXT BOOK:**

1. SoumendraMohanty, MadhuJagadeesh, and HarshaSrivatsa, “Big Data Imperatives: Enterprise Big Data Warehouse, BI Implementations and Analytics”, Apress Publication.

**REFERENCE BOOKS:**

1. Bid Data Now 2012 Edition”, O“Reilly, First Edition, 2012
2. Paul Zikopoulos, ThomasDeutsch, Dirk Deroos, David Corrigan, Krishnan Parasuraman and James Giles, “Harness the power of Big Data”, McGrawHill, 2013

<b>III B.C.A</b>	<b>FUNDAMENTALS OF DATA SCIENCE</b>	<b>GCA52D</b>
<b>SEMESTER V</b>		<b>HRS/WK – 5</b>
<b>GE – I (2)</b>		<b>CREDIT - 4</b>

**UNIT –I:** [15 Hrs ]

**Introduction:** Data mining – Kinds of Data Mined – Kind of Patterns Can be Mined – Technologies of Data mining– kind of Targeted Applications– Major Issues in Data Mining.

**UNIT –II:** [15 Hrs ]

**Data Pre-Processing:** Overview –Data Cleaning - Data Integration– Data Reduction: Overview of Data Reduction Strategies - Histograms – Clustering – Sampling- Data Cube Aggregation – Data Transformation and Data Discretization: Data Transformation Strategies overview - CLASSIFICATION: Basic Concepts Clustering: Cluster Analysis-K-Means: A Centroid- Based Techniques.

**UNIT –III:** [15 Hrs ]

**Digital Data :** Types of Digital Data: Introduction to Big Data - Big Data Analytics- Big Data Technologies Landscape: NoSQL.

**UNIT- IV:** [15 Hrs ]

**Hadoop:** Hadoop: Features of Hadoop – Key Advantages of Hadoop – Versions of Hadoop – Overview of Hadoop Ecosystems – Hadoop Distribution – Hadoop versus SQL – Integrated Hadoop Systems offered by Leading Market Vendors- Cloud based Hadoop Solution. Introducing Hadoop: Why Hadoop –Why not RDBMS – RDBMS versus Hadoop – Distributed Computing Challenges – History of Hadoop – Hadoop Overview – Use Case of Hadoop- Hadoop Distributors – HDFS.

**UNIT – V:** [15 Hrs ]

**MapReduce:** Introduction to MapReduce Programming: Introduction to HIVE - Hive- Hive Architecture – Hive Data Types- Hive File Format – Hive Query Language. Introduction to Pig: Pig – Anatomy of Pig – Pig on Hadoop –Pig Philosophy – ETL Processing – Pig Latin Overview

**TEXT BOOK:**

1. Jiawei Han and MicelineKamber, Data Mining Concepts and Techniques, MorganKaufmann Publishers, California, USA, 2016.
2. Seema Acharya and SubhashiniChellappan, Big Data Analytics, Wiley India Pvt Ltd,2018.

**REFERENCE BOOKS:**

1. Mohammed J. Zaki, Wagner Meira, Jr, Data Mining and Machine Learning: Fundamental Concepts and Algorithms, Cambridge University Press, United Kingdom, 2020.
2. John D. Kelleher and Brendan Tierney, Data Science, The MIT Press Essential Knowledge Series, 2018.
3. Benjamin Bengfort, Jenny Kim, Data Analytics with Hadoop, O'Reilly Media, California USA, 2016.

III B.C.A	<b>DATA MINING</b>	GCA52E
SEMESTER V		HRS/WK-5
GE – I (3)		CREDIT-4

**UNIT-I: [15 Hrs ]**

**Introduction:** Definition, DBMS Vs Data Mining, Issues and Challenges in DM, DM Application Areas, Basic Data Mining Task, data mining metrics, social implications of datamining, Data Mining Vs Knowledge Discovery in Databases(KDD).

**Related concepts:** OLTP system, IR system, Decision Support Systems, dimensional modeling, data ware housing, OLAP, web search engines

**UNIT-II: [15 Hrs ]**

Statistical perspectives on Data Mining: Point estimation, model based on summarization, Bayes Theorem, Hypothesis testing, Regression and Correlation. Non parametric techniques- Decision Trees, Neural Networks, Genetic Algorithms

**UNIT- III: [15 Hrs ]**

**Classification:** Introduction, Issues in classification, Bayesian classification, distance based algorithms: KNN, Decision Tree, KNN Supervised Learning.

**UNIT-IV: [15 Hrs ]**

**Clustering:** Introduction, Outliers, Hierarchical Algorithms, Partitioned Algorithms, Neural Network based algorithms, BRICH algorithm.

**UNIT-V: [15 Hrs ]**

**Association:** Introduction-Method to discover Association Rule, basic algorithms, large itemsets, Data Parallelism- Advanced Association Rules Techniques.

**TEXT BOOKS:**

1. Jiawei Han, Micheline Kamber, "Data Mining: concepts and techniques ", Morgan Kaufmann Publisher, second edition.
2. G.K. Gupta, "Introduction to Data Mining with case studies", PHI, second edition.

**REFERENCE BOOKS:**

1. Data Mining Techniques: Arun K.Pujari,
2. Data Mining: Introductory and Advanced Topics: M.H.Dunham Pearson Education.
3. Data Mining: Concepts & Techniques, Morgan Kaufman.2006.

<b>III B.C.A</b>	<b>R PROGRAMMING</b>	<b>CA614B</b>
<b>SEMESTER- VI</b>		<b>HRS/WK- 4</b>
<b>CORE-10</b>		<b>CREDIT - 4</b>

**UNIT-I: [12 Hrs ]**

**Introduction :** R data types, Operations on matrices, dataframes, lists, setwd, read.table, read.csv, write.csv, creation of new variables, categorization, cut, factor; round, apply, creation of patterned variables-saving output to a file.

**UNIT-II: [12 Hrs ]**

**Graphics in R-** the plot command, histogram, barplot, boxplot- points, lines, segments, arrows, paste-inserting mathematical symbols in a plot, pie diagram, customization of plot-setting graphical parameters-text and mtext, the pairs command, colours and palettes, saving to a file.

**UNIT-III: [12 Hrs ]**

**Basic Statistics-** obtaining descriptive statistics, measures of correlation and association, generating samples from standard discrete and continuous distributions, one and two sample ttests, F-test for equality of variances, chi-squared test of independence, fitting of distributions, qq plot.

**UNIT-IV: [12 Hrs ]**

**Matrix operations-** addition, subtraction, multiplication, determinant, inverse, solving linear equations, computing eigenvalues, matrix decomposition- lu, qr and svd, finding g inverse, finding a basis, orthonormalization, finding rank.

**UNIT-V: [12 Hrs ]**

**Linear model**—fitting of linear model, goodness of fit measures, predicted values and residuals; checking assumptions of the model, ANOVA table.

**TEXT BOOKS:**

1. Purohit, S. G., Gore, S. D., and Deshmukh, S. R. (2009). Statistics Using R, Narosa Publishing House, NewDelhi.

**REFERENCE BOOKS:**

1. Everitt, B. S., and Hothorn, T. (2010): A Handbook of Statistical Analyses Using R, Second Edition, Chapman and Hall/CRC Press.
2. Crawley, M.J. (2013): The R Book, John Wiley and Sons, Limited.

<b>III B.C.A</b>	<b>R PROGRAMMING</b>	<b>CAP607A</b>
<b>SEMESTER- VI</b>		<b>HRS/WK- 5</b>
<b>PRACTICAL-VII</b>		<b>CREDIT - 3</b>

**Lab Exercises:**

R types and classes, Functions, Data Structures, Reading and writing Data from files, Variables, Control Structures. Input Output, Graphics, Data Visualization, Simulation-Generating Random Numbers, Setting the random number seed, Simulating a Linear Model, Random Sampling, Data Analysis Case Study.

- i) Working with data types, variables, operators in R.
- ii) Write a program to find list of even numbers from 1 to n using R-Loops.
- iii) Create a function to print squares of numbers in sequence.
- iv) Write a program to join columns and rows in a data frame using cbind() and rbind() in R.
- v) Implement different String Manipulation functions in R.
- vi) Implement different data structures in R (Vectors, Lists, Data Frames)
- vii) Write a program to read a csv file and analyze the data in the file in R.
- viii) Create pie chart and bar chart using R.
- ix) Create a data set and do statistical analysis on the data using R

<b>III B.C.A</b>	<b>BLOCK CHAIN TECHNOLOGIES</b>	<b>GCA63D</b>
<b>SEMESTER VI</b>		<b>HRS/WK – 4</b>
<b>GE–II (1)</b>		<b>CREDIT - 4</b>

#### **UNIT- I**

**[12 Hrs]**

**Introducing Blockchain:** What blockchains do-Why blockchains matter-The Structure of Blockchains-Blockchain Applications-The Blockchain Life Cycle-Consensus: The Driving Force of Blockchains-Blockchains in Use-Current blockchain uses-Future blockchain-applications.

#### **UNIT-II**

**[12 Hrs]**

**Getting into Blockchain Technology** -Blockchain Technology-Creating a secure environment-Buying the first Bitcoin-Securing and Exchanging the Cryptocurrency-Downloading Jaxx-Securing theJaxx wallet-Transferring Bitcoin to Jaxx-Trading Bitcoin for Ether-Loading up theMetaMask account-Setting up a CryptoKittiesaccount-Building a Private Blockchain with Docker and Ethereum-Preparing the computer-Building the blockchain.

#### **UNIT-III**

**[12 Hrs]**

**Bitcoin Blockchain:**Getting a Brief History of the Bitcoin Blockchain-The New Bitcoin: Bitcoin Cash-Debunking Some Common Bitcoin Misconceptions-Bitcoin: The New Wild West-Fake sites-Get-rich-quick schemes-Mining for Bitcoins-Making the First Paper Wallet.

#### **UNIT-IV**

**[12 Hrs]**

**The FactomBlockchain:**The purpose of the Factom blockchain: Publishing anything-Incentives of federation-Building on Factom-Authenticating documents and building identities using APIs-Getting to know the Factoid: Not a normal cryptocurrency-Anchoring the application-Publishing on Factom-Building transparency in the mortgage industry-Verifying physical documents: dLoc with Factom.

#### **UNIT-V**

**[12 Hrs]**

**Hyperledger:**Getting to Know Hyperledger-Identifying Key Hyperledger Projects-Focusing on Fabric-Investigating the Iroha project-Diving into Sawtooth Lake-Building a System in Fabric-Building asset tracking with Hyperledger Composer-Working with Smart Contracts on Hyperledger- Setting up an auction network- Setting up auction windows- Creating an auctioneer-Creating two participants-Creating a new asset- Creating a new listing- Auctioning off the car-Closing the auction.



**TEXT BOOK:**

1. Tiana Laurence, Blockchain For Dummies, 2nd Edition,ISBN: 978-1-119-55513-1 April 2019

**REFERENCES BOOKS**

1. Salman Baset, Luc Desrosiers, Nitin Gaur, Petr Novotny, Anthony O'Dowd, Venkatraman Ramakrishna, "Hands-On Block chain with Hyper ledger: Building decentralized applications with Hyperledger Fabric and Composer", 2018.
2. Bahga, Vijay Madiseti, "Block chain Applications: A Hands-On Approach", ArshdeepBahga, Vijay Madiseti publishers 2017.

<b>B.C.A</b>	<b>CYBER SECURITY</b>	<b>GCA63E</b>
<b>SEMESTER VI</b>		<b>HRS/WK – 4</b>
<b>GE-II (2)</b>		<b>CREDIT- 4</b>

**UNIT – I** **[12 Hrs]**

**Introduction to Cyber security:** Defining Cyberspace and Overview of Computer and Web-technology- Architecture of cyberspace- Communication and web technology- Internet-World wide web--Advent of internet- Internet infrastructure for data transfer and governance-Internet society- Regulation of cyberspace-Concept of cyber security-Issues and challenges of cyber security.

**UNIT-II** **[12 Hrs]**

**Cyber crimeand Cyber law:** Classification of cyber crimes-Commoncyber crimes- cyber crime targeting computers and mobiles-cyber crime against women and children- financial frauds-social engineering attacks- malware and ransomware attacks- zero day and zero clickattacks- Cyber criminals modus-operandi -Reporting of cyber crimes- Remedial and mitigation measures- Legal perspective of cyber crime- IT Act 2000 and its amendments-Cyber crime and offences- Organisations dealing with Cyber crimeandCyber security in India- Case studies.

**UNIT-III** **[12 Hrs]**

**Social Media Overview and Security:**Introduction to Social networks. Types of Social media- Social media platforms- Social media monitoring-Hashtag- Viral content- Social media marketing- Social media privacy- Challenges- opportunities and pitfalls in online social network- Security issues related to social media- Flagging and reporting of inappropriate content- Laws regarding posting of inappropriate content- Best practices for the use of Social media- Case studies.

**UNIT-IV** **[12 Hrs]**

**E - Commerce and Digital Payments :**Definition of E- Commerce- Main components of E-Commerce- Elements of E-Commerce security- E-Commerce threats- E-Commerce security best practices- Introduction to digital payments- Components of digital payment and stake holders- Modes of digital payments- Banking Cards- Unified Payment Interface (UPI)- e-Wallets- Unstructured Supplementary Service Data (USSD)-Aadhar enabled payments- Digital payments related common frauds and preventive measures. RBI guidelines on digital payments and customer protection in unauthorised banking transactions.Relevant provisions of Payment Settlement Act-2007.

**UNIT-V** **[12 Hrs]**

**Digital Devices Security- Tools and Technologies for Cyber Security:** End Point device and Mobile phone security- Password policy- Security patch management- Data backup- Downloading and management of third party software- Device security policy- Cyber Security best practices- Significance of host firewall and Ant-virus- Management of host firewall and Anti-virus- Wi-Fi security- Configuration of basic security policy and permissions.

## **TEXT BOOK**

1. Cyber Crime Impact in the New Millennium, by R. C Mishra ,Auther Press. Edition2010.

## **REFERENCES BOOKS**

2. Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives by SumitBelapure and Nina Godbole, Wiley India Pvt. Ltd. (FirstEdition, 2011)
3. Security in the Digital Age: Social Media Security Threats and VulnerabilitiesbyHenry A. Oliver, Create Space Independent Publishing Platform. (Pearson , 13<sup>th</sup>November, 2001)
4. Electronic Commerce by Elias M. Awad, Prentice Hall of India Pvt Ltd.
5. Cyber Laws: Intellectual Property & E-Commerce Security by Kumar K, Dominant Publishers.

<b>III B.C.A</b>	<b>ETHICAL HACKING</b>	<b>GCA63F</b>
<b>SEMESTER VI</b>		<b>HRS/WK – 4</b>
<b>GE-II (3)</b>		<b>CREDIT- 4</b>

**UNIT-I** **[12 Hrs]**  
**Introduction to ethical hacking.** Fundamentals of computer networking-TCP/IP protocol stack-IP addressing and routing-Routing protocols.

**UNIT-II** **[12 Hrs]**  
**Introduction to network security:** Information gathering: reconnaissance, scanning, etc.  
**Vulnerability assessment:** OpenVAS, Nessus, etc.-System hacking: password cracking, penetration testing, etc

**UNIT-III** **[12 Hrs]**  
**Attacks:** Social engineering attacks. Malware threats, penetration testing by creating backdoors.  
**Cryptography:** Introduction to cryptography, private-key encryption, public-key encryption.

**UNIT-IV** **[12 Hrs]**  
**Protocols and Authentication:** Key exchange protocols, cryptographic hash functions, applications. Steganography, biometric authentication, lightweight cryptographic algorithms.

**UNIT-V** **[12 Hrs]**  
**Sniffing:** Wireshark, ARP poisoning, DNS poisoning. Hacking wireless networks, Denial of service attacks. **Elements of hardware security:** side-channel attacks, physical unclonable functions. **Hacking web applications:** vulnerability assessment, SQL injection, cross-site scripting.  
**Case studies:** various attacks scenarios and their remedies.

**ONLINE REFERENCE:**

[https://onlinecourses.nptel.ac.in/noc22\\_cs13/](https://onlinecourses.nptel.ac.in/noc22_cs13/)

**REFERENCES BOOKS:**

1. Data and Computer Communications -- W. Stallings.
2. Data Communication and Networking -- B. A. Forouzan
3. TCP/IP Protocol Suite -- B. A. Forouzan
4. UNIX Network Programming -- W. R. Stallings
5. Introduction to Computer Networks and Cybersecurity -C-H. Wu and J. D. Irwin
6. Cryptography and Network Security: Principles and Practice -- W. Stallings.

<b>YEAR II</b>	<b>R PROGRAMMING FOR DATA SCIENCE</b>	<b>PIT31A</b>
<b>SEMESTER III</b>		<b>HRS/WK – 4</b>
<b>CORE -7</b>		<b>CREDIT- 4</b>

**Objective:**

To prepare students with the technical knowledge and skills needed to protect and defend computer systems and networks.

**Course Outcomes (CO's):**

At the end of the Course the students should be able to possess

**CO1: Knowledge pertained to perform operations on matrices, lists and data frames.**

**CO2: Ability to plot diagrams and graphs in R.**

**CO3: Ascertain the art of performing statistical analysis using R.**

**CO4: Profound knowledge to perform matrix operations and manipulations in R.**

**CO5: Be able to fit linear models in R.**

SEMESTER III	COURSE CODE:					COURSE TITLE : R PROGRAMMING FOR DATA SCIENCE								HOURS:4	CREDITS:4
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)								MEAN SCORE OF CO'S	
CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	Mean score	
CO1	5	5	4	4	5	5	5	5	3	5	5	5	3	4.5	
CO2	5	5	4	5	5	5	5	5	4	5	5	5	5	4.7	
CO3	5	5	4	5	5	5	5	5	3	5	5	5	5	4.7	
CO4	5	5	5	5	5	5	5	5	3	5	5	5	3	4.7	
CO5	5	5	5	5	5	5	5	5	4	5	5	5	3	4.8	
Mean Overall Score														4.7	

**Result: The score of this course is 4.7(Very High)**

<b>Association</b>	<b>1%-20%</b>	<b>21%-40%</b>	<b>41%-60%</b>	<b>61%-80%</b>	<b>81%-100%</b>
<b>Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Interval</b>	<b>0&lt;=rating&lt;=1</b>	<b>1.1&lt;=rating&lt;=2</b>	<b>2.1&lt;=rating&lt;=3</b>	<b>3.1&lt;=rating&lt;=4</b>	<b>4.1&lt;=rating&lt;=5</b>
<b>Rating</b>	<b>Very Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>High</b>	<b>Very High</b>

The value shows that the course has **VERY HIGH** association with programme outcomes and programme specific outcomes

## **UNIT - I**

[12 Hrs]

Introduction : R data types, Operations on matrices, dataframes, lists, setwd, read.table, read.csv, write.csv, creation of new variables, categorization, cut, factor; round, apply, creation of patterned variables-saving output to a file.

## **UNIT - II**

[12 Hrs]

**Graphics in R-** the plot command, histogram, barplot, boxplot- points, lines, segments, arrows, paste-inserting mathematical symbols in a plot, pie diagram, customization of plot-setting graphical parameters-text and mtext, the pairs command, colours and palettes, saving to a file.

## **UNIT - III**

[12 Hrs]

**Basic Statistics-** obtaining descriptive statistics, measures of correlation and association, generating samples from standard discrete and continuous distributions, one and two sample ttests, F-test for equality of variances, chi-squared test of independence, fitting of distributions, qq plot.

## **UNIT - IV**

[12 Hrs]

**Matrix operations-** addition, subtraction, multiplication, determinant, inverse, solving linear equations, computing eigenvalues, matrix decomposition- lu, qr and svd, finding g inverse, finding a basis, orthonormalization, finding rank.

## **Unit - V**

[12 Hrs]

Linear model–fitting of linear model, goodness of fit measures, predicted values and residuals; checking assumptions of the model, ANOVA table.

## **TEXT BOOKS (for Units 1 to 5)**

1. Purohit, S. G., Gore, S. D., and Deshmukh, S. R. (2009). Statistics Using R, Narosa Publishing House, NewDelhi.

## **REFERENCE BOOKS**

1. Everitt, B. S., and Hothorn, T. (2010): A Handbook of Statistical Analyses Using R, Second Edition, Chapman and Hall/CRC Press.  
2. Crawley, M.J. (2013): The R Book, John Wiley and Sons, Limited

<b>YEAR - II</b>	<b>Practical IV : R programming and Open Source Technologies-PHP</b>	<b>PITP34</b>
<b>SEMESTER -III</b>		<b>HRS/WK - 5</b>
<b>PRACTICAL IV</b>		<b>CREDIT - 5</b>

**Objective:**

- To enable the students to learn the programming concepts in Android applications.
- To enable the students to build applications in PHP.

**Course Outcomes:**

**At the end of the Course the students should be able to**

**CO1: Develop Basic applications using R**

**CO2: Develop applications using R in built functions**

**CO3: Develop Application using Forms in PHP.**

**CO4: Develop different application such as online shopping cart,**

**banking App.CO5: Develop Database application using Android and PHP**

SEMESTER III	COURSE CODE:18PITP33					TITLE OF THE PAPER:ANDROID APPLICATIONS AND WEB DEVELOPMENT USING PHP (Practical)					HOURS:5	CREDITS:5
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)					MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	5	5	5	5	5	5	5	5	5	5	5	
CO2	4	4	4	4	4	5	5	5	5	5	4.5	
CO3	4	4	4	4	4	5	5	5	5	5	4.5	
CO4	4	4	4	4	4	5	5	5	5	5	4.5	
CO5	4	4	4	4	4	5	5	5	5	5	4.5	
Mean Overall Score											4.6	

This Course is having VERY HIGH association with Programme Outcomes and Programme Specific Outcomes.

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

## **Lab Syllabus**

### **R Programming**

**[40 Hrs]**

1. Working with data types, variables, operators in R.
2. Write a program to find list of even numbers from 1 to n using R-Loops.
3. Create a function to print squares of numbers in sequence.
4. Write a program to join columns and rows in a data frame using cbind() and rbind() in R.
5. Implement different String Manipulation functions in R.
6. Implement different data structures in R (Vectors, Lists, Data Frames)
7. Write a program to read a csv file and analyze the data in the file in R.
8. Create pie chart and bar chart using R.
9. Create a data set and do statistical analysis on the data using R

### **PHP**

**[35 Hrs]**

1. String and Date functions in PHP.
2. Form creation using POST method
3. Database Operations using mysql.
4. Login form using session.
5. Class and Object in PHP.
6. Student mark list creation with validation.
7. Electricity bill preparation.
8. Develop a simple online shopping cart.
9. Develop a simple bank application.
10. Develop an application for employee pay slip.



<b>YEAR – I</b>	<b>PYTHON PROGRAMMING</b>	<b>PIT11A</b>
<b>SEMESTER – I</b>		<b>HRS/WK – 7</b>
<b>CORE – 1</b>		<b>CREDIT - 5</b>

### Objective

The objective of a Python programming course is to enable students to develop proficiency in Python programming, covering fundamental syntax, problem-solving skills, and practical application development for various domains such as web development, data science, and machine learning.

### Course Outcomes (CO's):

On successful completion of this course, the students will be able to:

- CO1: Acquire knowledge on the basic concepts in python language.**
- CO2: Apply the various data types and identify the usage of control statements, Loops, functions and modules in python for processing the data.**
- CO3: Analyze and solve problems using basic constructs and techniques of python.**
- CO4: Assess the approaches used in the development of interactive application.**
- CO5: To build real time programs using python.**

SEMESTER I	COURSE CODE: PIT11A					COURSE TITLE :PYTHON PROGAMMING					HOURS:7	CREDITS:5
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)					MEAN SCORE OF CO'S	
	PO 1	PO 2	PO 3	PO 4	PO 5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	5	5	5	5	5	5	5	5	5	5	5	
CO2	5	5	5	5	5	5	5	5	5	5	5	
CO3	4	4	4	4	4	5	5	5	5	5	4.5	
CO4	4	4	4	4	4	4	4	4	4	4	4	
CO5	4	4	4	4	4	4	4	4	4	4	4	
Mean Overall Score											4.5	

**Result: The score of this course is 4.5 (Very High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **VERY HIGH** association with Programme Outcomes and Programme Specific Outcomes.

## UNIT – I

[21Hrs]

**Core Python:** Introduction - Python Basics: Comments - Statements and Syntax - Variable assignment - Identifiers - Python objects: Built-in-types - Internal types - Standard type operators - Standard type-Built-in-functions. Numbers: Introduction to Numbers - Integers - Floating point numbers - Complex numbers - Operators - Built-in and factory functions –Conditionals and Loops - Sequences: Strings, Lists and Tuples.

## UNIT - II

[21Hrs]

**Mapping and set types.-** Functions and functional programming: **Introduction** - Calling functions - Creating functions - passing functions - Formal arguments - Variable - Length Arguments - Functional Programming - Variable Scope – Recursion.

## UNIT - III

[21Hrs]

**Modules:** Modules and Files – namespaces - Importing Modules - Features - Built-in functions. **Object Oriented Programming:** Introduction - Object Oriented Programming – Encapsulation Inheritance – Polymorphism - **Errors and Exceptions:** Introduction – Exceptions in Python.

## UNIT – IV

[21Hrs]

**GUI Programming:** Introduction – **Using Widgets:** Core widgets- Generic widget properties – Labels – Buttons – Radio Buttons – Check Buttons – Text – Entry – List Boxes – Menus – Frame – Scroll Bars –Scale

## UNIT – V

[21Hrs]

**Database Programming:** Connecting to a database using MongoDB - Creating Tables - INSERT-UPDATE - DELETE - READ operations.

## TEXT BOOKS:

1. E Wesley J. Chun, (2007), “Core Python Programming”, Pearson Education, Second Edition – (Unit I,II,III).
2. Charles Dierbach, (2015), “Introduction to Computer Science Using Python A Computational Problem-Solving Focus”, Wiley India Edition- (Unit III- Object Oriented Programming)
3. Martin C Brown, (2018), “The Complete Reference Python”, McGraw Hill Education (India) Private Limited – (Unit IV)

## REFERENCE BOOKS:

1. Mark Lutz, (2013), “Learning Python Powerful Object Oriented Programming”, O’reilly Media, 5 th Edition.
2. Timothy A. Budd, (2011), “Exploring Python”, Tata MCGraw Hill Education PrivateLimited, First Edition.
3. Allen Downey, Jeffrey Elkner, Chris Meyers, (2012), “How to think like a computerscientist: learning with Python”

<b>YEAR - I</b>	<b>PRACTICAL-I : PYTHON PROGRAMMING</b>	<b>PITP11A</b>
<b>SEMESTER - I</b>		<b>HRS/WK - 7</b>
<b>CORE - 2</b>		<b>CREDIT - 5</b>

## Objective

This course gives practical experience in Python basics, Object Oriented programming like Classes, Inheritance and Polymorphism, GUI Applications and Database connection.

## Course Outcomes (CO's):

On successful completion of this course, the students will be able to:

**CO1 : Understand the significance of control statements, loops and functions.**

**CO2 : Apply the core data structures available in python to store, process and sort the data.**

**CO3 : Analyze the real time problem using suitable python concepts.**

**CO4 : Assess the complex problems using appropriate concepts in python.**

**CO5 : Develop the real time applications using python programming language.**

SEMESTER I	COURSE CODE: PITP11A					COURSE TITLE PYTHON PROGRAMMING - PRACTICAL					HOURS:7	CREDITS:5
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)					MEAN SCORE OF CO'S	
	PO1	PO 2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	5	5	5	5	5	5	5	4	4	4	4.70	
CO2	4	4	4	4	4	4	4	4	4	4	4	
CO3	4	4	4	4	4	4	4	4	4	4	4	
CO4	4	4	4	4	4	4	4	4	4	4	4	
CO5	4	4	4	4	4	4	4	4	4	4	4	
Mean Overall Score											4.1	

**Result: The score of this course is 4.1 (Very High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **VERY HIGH** association with Programme Outcomes and Programme Specific Outcomes

## **Lab Exercise**

1. Python Basic programs
2. Control Structures
3. Lists
4. Functions and Recursions
5. Modules
6. String Processing
7. Dictionaries and Sets
8. Classes and Objects
9. Polymorphism
10. Inheritance
11. GUI Application

<b>YEAR – I</b>	<b>PRACTICAL-II : WEB DEVELOPMENT USING WORD PRESS</b>	<b>PITP12A</b>
<b>SEMESTER - I</b>		<b>HRS/WK - 6</b>
<b>CORE - 3</b>		<b>CREDIT – 4</b>

### Objective

The primary course objective of this paper is to learn the fundamental web concepts, HTML, DHTML, JavaScript and Word Press.

### Course Outcomes (CO's):

On successful completion of this course, the students will be able to:

- CO1 :** Identify the tools which will be suitable for the requirement of the webpage.
- CO2 :** Implement Java script and Style Sheets effectively in the Web Pages
- CO3 :** Analyze the different tools and built-in functions available to be applied in the webpage.
- CO4 :** Rate the design and effectiveness of the Web Pages created.
- CO5 :** Design and publish a website using Word press.

SEMESTER I	COURSE CODE: PITP12A					COURSE TITLE : WEB DEVELOPMENT USING WORD PRESS - PRACTICAL					HOURS:6	CREDITS:4
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)					MEAN SCORE OF CO'S	
	PO 1	PO 2	PO3	PO 4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	5	5	5	5	5	5	5	5	5	5	5	
CO2	5	5	5	5	5	5	5	5	5	5	5	
CO3	4	4	4	4	4	5	5	5	5	5	4.5	
CO4	4	4	4	4	4	5	5	5	5	5	4.5	
CO5	4	4	4	4	4	5	5	5	5	5	4.5	
Mean Overall Score											4.7	

**Result: The score of this course is 4.7 (Very High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **VERY HIGH** association with Programme Outcomes and Programme Specific Outcomes.

## **UNIT - I**

**[18 Hrs]**

Introduction to HTML - Lists - Adding Graphics to HTML Documents - Tables - Linking Documents - Frames- Developing HTML Forms

Exercises:

1. Creating ordered and unordered Lists using simple tags
2. Creating Tables
3. Creating Hyperlinks
4. Creating Frames

## **UNIT - II**

**[18 Hrs]**

Dynamic HTML - Cascading Style Sheets - Use of SPAN Tag - External Style Sheets -Use of DIV Tag - Developing Websites

Exercises:

1. Creating Embedded style sheet
2. Use of External style sheet
3. Creating Inline style sheet

## **UNIT – III**

**[18 Hrs]**

Introduction to JavaScript - JavaScript in Web Pages - Advantages - Writing JavaScript into HTML Basic Programming Techniques - Operators and Expressions- JavaScript Programming Construct: Conditional Checking, Controlled Loops, Functions: Built-in Functions, User-Defined Functions - Placing Text in a Browser - Dialog Boxes.

Exercises:

1. Using Conditional checking
2. Using Looping constructs
3. Using Arrays and Functions
4. Creating Dialog Box

## **UNIT - IV**

**[18 Hrs]**

JavaScript Document Object Model: Introduction - Understanding Objects in HTML - Handling Events using JavaScript. Forms used by a Website: Form Object - Built-in Objects.

Exercises:

1. Handling Events
2. Creating Forms
3. Form Validation for Name, E-Mail Id and Password
4. Form Validation for Date, Month and Year
5. Using Built-in Objects

## **UNIT – V**

**[18 Hrs]**

Word Press: Installation - Stetting and administration- Word press: Theming basics - Our First Word Press Website - Theme Foundation - Menu and navigation - Home page - Dynamic Sidebars and Widgets - Page - archive Page results - Testing and Launching.

Exercises:

Case Study: Design a complete website using word press and prepare it for publishing.

### **TEXT BOOKS:**

1. Ivan N. Bayross, (2005), Web Enabled Commercial Applications Development Using HTML, DHTML, JavaScript, perlCGI, 3<sup>rd</sup> Edition, BPB Publications. (Unit I, II, III and IV)
2. Jesse Friedman,( 2012), Web Designer's Guide to WordPress: Plan, Theme, Build, Launch (Voices That Matter), 1<sup>st</sup> Edition , New Riders. (Unit V)

### **REFERENCE BOOKS:**

1. N.P. Gopalan, J. Akilandeswari, (2009), Web Technology: A Developer's Perspective, Eastern Economy Edition, PHI Learning Private Limited.
2. Deitel&Deitel, (2000), Internet and World Wide Web How to program, Prentice Hall.
3. Jon Duckett, (2004), Beginning Web Programming with HTML, XHTML, and CSS, Wiley Publishing, Inc.

<b>YEAR - I</b>	<b>DATA STRUCTURES</b>	<b>EPIT12A</b>
<b>SEMESTER - I</b>		<b>HRS/WK - 5</b>
<b>ELECTIVE - I(1)</b>		<b>CREDIT - 3</b>

### Objective

The objective of studying data structures is to understand and implement efficient ways of organizing and manipulating data to optimize algorithmic performance and solve computational problems.

### Course Outcomes (CO's):

At the end of the Course the students should be able to exhibit

**CO1: Knowledge pertaining to basic data structures**

**CO2: The skill to identify the different operations and memory representations**

**CO3: The skill to Interpret different techniques with their complexities**

**CO4: Comparing abilities among the applications of various data structures**

**CO5: Skill to choose an algorithm to solve simple problems suited for appropriate situations**

SEMESTER 1	COURSE CODE: EPIT12A					COURSE TITLE DATA STRUCTURES					HOURS:5	CREDITS:3
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)					MEAN SCORE OF CO'S	
	PO 1	PO 2	PO3	PO 4	PO 5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	4	4	4	4	4	3	3	3	5	3	3.70	
CO2	4	4	4	4	3	3	3	3	5	4	3.70	
CO3	3	3	3	3	3	3	3	3	4	3	3.10	
CO4	3	3	3	3	3	3	3	3	4	3	3.10	
CO5	3	3	3	3	3	3	3	3	4	3	3.10	
Mean Overall Score											3.4	

**Result: The score of this course is 3.4 (High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

e is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

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## UNIT I

[15 Hrs]

**Introduction and Overview:** Definitions – Concept of Data Structures – Overview of Data Structures – Implementation of Data Structures – Arrays: Definition – One Dimensional Array – Multidimensional Arrays: Two Dimensional Array – Sparse Matrices – Three dimensional and n-dimensional Arrays – Stacks : Introduction – Definition – Representation of Stack – Operations on Stack – Applications of Stacks: Evaluation of Arithmetic Expressions – Implementation of Recursion - Tower of Hanoi Problem

## UNIT II

[15 Hrs]

**Queues:** Introduction – Definition – Representation of Queues – **Various Queue Structures :** Circular Queue – Deque – Priority Queue – **Applications of Queues :** Simulation – CPU Scheduling in a Multiprogramming Environment – Round Robin Algorithm – **Linked Lists:** Single Linked List – Circular Linked List – Double Linked List – Circular Double Linked List – **Applications of Linked List:** Polynomial Representation

## UNIT III

[15 Hrs]

**Trees:** Basic Terminologies – Representation of Binary Tree: Linear Representation – Linked Representation – **Operations:** Traversals – **Types of Binary Trees:** Expression Tree – Binary Search Tree – Splay tree

## UNIT IV

[15 Hrs]

**Sorting:** Bubble Sort, Insertion Sort, Selection Sort, Shell Sort – Quick Sort - Merge Sort -Radix Sort - Heap Sort – **Searching:** Linear Search - Binary Search

## UNIT V

[15Hrs]

**Graphs:** Introduction – Graph representation and its operations – Path Matrix – Graph Traversal - Application of DFS – Shortest Path Algorithm - **Minimum Spanning Tree :** Prim's Algorithm – Kruskal's Algorithm - Greedy – Knapsack – Back Tracking – 8 Queens

## TEXT BOOKS:

1. Debasis Samantha (2013), Classic Data Structures, Second Edition, PHI Learning Private Limited.
2. P. Sudharsan, J. John Manoj Kumar, C & Data Structures, Third Edition, RBA Publications. Unit 4: Chapter 14, Unit 5: Chapter 13
3. Ellis Horowitz, SartajSahni, Sanguthevar Rajeshakaran, (2007), Fundamentals of Computer Algorithms, Second Edition, Universities Press (P) Limited

## REFERENCE BOOKS:

1. Sara Baase, (1991), Computer Algorithms – Introduction to Design and Analysis, Addison- Wesley Publishing Company
2. Robert Kruse, C.L.Tondo, Bruce Leung, Data Structures and Program Design in C ,2<sup>nd</sup> Edition, PHI Publications

<b>YEAR - I</b>	<b>OPERATING SYSTEMS</b>	<b>EPIT13A</b>
<b>SEMESTER - I</b>		<b>HRS/WK - 5</b>
<b>ELECTIVE - II</b>		<b>CREDIT - 3</b>

### Objective

To develop fundamental knowledge of Operating systems, to become familiar with CPU scheduling, memory and file management concepts, to learn concepts and programming techniques of Linux.

### Course Outcomes (CO's):

At the end of the Course the students should be able to exhibit

**CO1: Knowledge on the fundamental concepts of an OS**

**CO2: The importance of open-source operating system commands**

**CO3: And Identify, stimulate management activities of operating system**

**CO4: Knowledge pertaining to the various services provided by the operating system**

**CO5: Skills to identify problems related to process, scheduling, deadlock, memory and files.**

SEMESTER I	COURSE CODE: EPIT13A					COURSE TITLE: OPERATING SYSTEMS					HOURS:5	CREDITS:3
COURSE LEARNING OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFIC OUTCOMES(PSO)					MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CLO1	4	4	4	4	3	3	3	3	5	4	3.70	
CLO2	4	4	4	4	4	3	3	3	5	3	3.70	
CLO3	3	3	4	4	4	3	3	3	4	3	3.40	
CLO4	3	3	4	4	4	3	3	3	4	3	3.40	
CLO5	3	3	4	4	3	3	3	3	4	4	3.40	
Mean Overall Score											3.5	

**Result: The score of this course is 3.5 (High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcomes and Programme Specific Outcomes.

## UNIT - I

[15 Hrs]

**Introduction :** Evolution of Operating System - Structure - Processes - The Process Concepts - Inter Process Communication - IPC Problems - Scheduling Levels - Preemptive Vs Non- Preemptive Scheduling - **Scheduling Algorithms:** First Come First Served - Shortest Job First - Shortest Remaining Time Next - Three Level Scheduling - Round Robin Scheduling - Priority Scheduling -Multiple Queues - Shortest Process Next - Guaranteed Scheduling - Lottery Scheduling - Fair-Share Scheduling - Thread Scheduling

## UNIT - II

[15 Hrs]

Swapping - Virtual Memory - Page Replacement Algorithm – Segmentation.

## UNIT - III

[15 Hrs]

**Deadlock** - Examples of Deadlock - Detection - Recovery - Avoidance - Prevention – Semaphore - Shared Memory.

## UNIT – I

[15 Hrs]

**File System** - Files - Directories - I/O Management - Disks - Disk Arm Scheduling Algorithm.

## UNIT – V

[15 Hrs]

**Introduction to Linux:** Introducing Shell Programming - Linux File Systems - Linux File system calls - Implementation of Linux File systems - Linux Commands - Directory Oriented Commands - File Oriented Commands - Communication Oriented Commands- General Purpose Commands.

## TEXT BOOKS:

1. Andrew S. Tanenbaum, (2001), Modern Operating Systems, 2<sup>nd</sup> Edition, Prentice Hall of India.
2. B.Mohamed Ibrahim, (2005) Linux Practical Approach, Firewall Media

## REFERENCE BOOKS:

1. Silberchatz, Galvin, Gagne, (2003), Operating Systems Concepts, 6<sup>th</sup> Edition Wiley India Edition.
2. Jhon Goerzen, (2002), Linux Programming Bible, 4<sup>th</sup> Edition, Wiley- dreamtech India (P) Ltd..

<b>II - B.COM</b>	<b>INDIAN ECONOMY</b> (For the Students Admitted from the year 2023 onwards)	<b>AECM202A</b>
<b>SEMESTER – II</b>		<b>HRS/WK – 6</b>
<b>ALLIED -2</b>		<b>CREDIT –4</b>

**Objectives:**

1. To help the students understand the nature of Indian economy.
2. To have an all-around information about the varied sectors of the Indian Economy.

**Course Outcomes:**

At the end of the Course the students should be able to exhibit the following;

**CO1:** knowledge about the developing nations and its obstacles of economic development.

**CO2:** understands national income concepts, computation & constraints faced while calculating the National Income & occupational structure.

**CO3:** understands the role of industries in the development of the nation.

**CO4:** acquire knowledge of infrastructure development in the country.

**CO5:** knowledge of various problems of Indian economy and measures to solve the problems

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes.**

SEMESTER-IV	COURSE CODE: AECM202A				COURSE TITLE: INDIAN ECONOMY				HOURS:6	CREDITS:4
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)				PROGRAMME SPECIFIC OUTCOMES(PSO)				MEAN SCORE OF CO'S	
	PO 1	PO 2	PO 3	PO 4	PSO1	PSO2	PSO3	PSO4		
CO1	4	4	4	4	4	4	4	4	4	
CO2	5	5	5	5	5	5	5	5	5	
CO3	4	4	4	4	5	5	5	5	4.5	
CO4	4	4	4	4	4	4	4	4	4	
CO5	5	5	5	5	5	5	5	5	5	
<b>Mean Overall Score</b>									<b>4.5</b>	

**Result: The Score of this Course is 4.5 ( Very High)**

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome.

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

**UNIT I: Introduction**

**(18 Hrs)**

Development-Economic Development- Economic Growth- Difference between Economic Growth and Economic Development –Features of a Developing Economy – Determinants of Development and Growth-Obstacles to Economic Development.

**UNIT II: National Income****(18 Hrs)**

National Income- Concepts-Estimates of National Income – Methods of Calculating National Income – Difficulties in the Calculation of National Income – Causes for Slow Growth of National Income – Occupational structure-Structural Changes in Indian Economy .

**UNIT III: Agriculture and Industrial Sector****(18 Hrs)**

Agriculture-Green revolution -Agriculture & Environment- Industrialization -Role-Large scale industries-Iron and Steel industry-Cotton industry-Sugar industry-Cement industry-Petro chemical industry-Automobile industry-Growth of IT industry in India-Role of Small Scale industries & Agro based industries in India-SIPCOT-TIDCO-SIDCO-TIIC-DIC.

**UNIT IV: Infrastructure for Economic Development****(18 Hrs)**

Infrastructure –Role of Infra structure in Economic development-Recent measures to develop Infrastructure-Transport and its types-Energy--Classification of Energy-Communication- Health-Education.

**UNIT V: Problems of the Indian Economy****(18 Hrs)**

Major Problems of the Indian Economy: Poverty - Inequality –Unemployment –Present status of Indian agriculture-Food Self-sufficiency and Food Security in India - Measures to Reduce Poverty –Employment Generation Schemes.

**TEXT BOOKS:**

1. I.C. Dingra , Indian Economy, Sultan Chand and Sons, New Delhi.
2. RuddarDutt and K .P. M. Sundharam , Indian Economy, S. Chand and Co.Pvt. Ltd (Recent edition), New Delhi.

**REFERENCE BOOKS:**

1. A. N. Agarwal, Indian Economy: Problems of Development and Planning, Wishwaprakashan, New Delhi.
2. S.K.Misra and V.K. Puri, Indian Economy: Its Development Experience, Himalaya Publishing House, Mumbai.
3. S.Sankaran, Indian Economy, Margham publication, Chennai.

### **Question Paper Pattern**

Time: 3 hours

Marks: 75

Part - A : (10 x 2 = 20 marks)  
All the questions are to be answered

Part – B: (5 x 5 = 25 marks)  
Five questions with internal choice.  
(Either or pattern)

Part – C: (3 x 10 = 30 marks)  
Three out of five with open choice

**Note:** Questions should be asked from all the **UNITs** with equal weightage.

4. Resolved to remove **Technology in Banking** (Allied subject) and **English Foundational course for Bank Examination** (Generic elective-2) from IV semester to accommodate Tamil and English subjects in IV semester.

5. Resolved that Discipline specific elective-2 in V Semester is changed as Generic Elective-1 titled "**Principles of Auditing**" which will be offered by BBA (CA) department.

6. Resolved to remove Discipline specific elective-IV titled **Services Marketing** in VI Semester and New Course Titled **Marketing Management** is introduced as Generic Elective-2 offered by BBA (CA) department .

7. Resolved to offer **Digital and Social Media Marketing** as Generic Elective-2 in VI semester to the department of BBA(CA).

**B.** The board has given following suggestions to strengthen and update the syllabi.

1. Resolved to include **Redemption of shares** in **Corporate Accounting** in unit I, semester III
2. Resolved to remove V unit **Marginal Costing** in **Cost Accounting** and to include **Process Costing** in IV Semester
3. Resolved to include Computation of tax liability of an individual in unit V in **Income Tax Law & Practice** in semester V
4. Resolved to revise the syllabi of **Entrepreneurial Development** in semester V
5. Resolved to introduce **Customer Relationship Management in Banking** in VI semester in the place of Customer Relationship Management.

**C. The board has resolved the following for the batch 2023- 26**

1. Resolved to introduce the Skill development Course (with 2 hours and 2 credits) of Naan Mudhalvan scheme in II, IV and IV semesters.
2. Resolved to introduce "**Effective English**" with 2 hours and 2 credits in II semester as Skill Development Course under Naan mudhalvan scheme.
3. Resolved to introduce "**Microsoft office Fundamentals**" with 2 hours and 2 credits in IV semester as Skill Development Course under Naan mudhalvan scheme.
4. Resolved to introduce "**Upskilling course- Insurance**" with 2 hours and 2 credits in VI semester as Skill Development Course under Naan mudhalvan scheme.
5. It is resolved to conduct exams internally for SDC in II, IV and VI semesters
6. To allot 40 marks for CIA component and 60 marks for external exam.
7. Resolved to remove Professional English in I and II semesters to accommodate Skill Development Courses under Naan Mudhalvan scheme.
8. Resolved to include **Depreciation** in unit1 in Financial Accounting I in semester I
9. Resolved to include **Matrix Organisation, Project Organisation, Network Organisation and Virtual Organisation** in Unit III in **Principles of Management** in semester I

## **Minutes of Board of studies -II**

The Board of Studies' meeting for Commerce (Bank Management) Programme was conducted on 15<sup>th</sup> November, 2023 at 5.30pm through Google meet <https://meet.google.com/vos-ftie-vni>. The Chairman, **Rev. Fr. Dr. A. Alex** welcomed and introduced the members.

The following items were discussed in the BOS meeting **for the batch of 2023 -26 ( First year even semester)**

### **1. Batch 2021-2024 and Batch 2022-2025**

The board decided to keep the syllabi for batches 2021-2024 and 2022-2025 unchanged.

### **2. Financial Accounting II**

The board recommended to include **Accounting Standards for financial reporting -IFRS ( International Financial Reporting Standards)** Theory only, in **Financial Accounting II**. Hence the Units are rearranged as

Unit 1: Account Current and Average Due Date

Unit 2: Branch and Departmental Accounts

Unit 3: Partnership accounts - I - Admission , Retirement and Death of a Partner

Unit 4: Partnership Accounts -II -Dissolution of partnership

Unit 5: Accounting Standards for financial reporting -IFRS Theory only

### **3. Business Correspondence**

The board suggested to introduce **Business Law** instead of **Business Correspondence**. This change is due to implementation of TANSCHÉ syllabus in the first semester. The course Business Correspondence was already included in the first semester.

**4.** The BOS meeting came to the end by Vote of Thanks proposed by Dr.R.Krishnaveni.



**Employability**

**Entrepreneurship**

**Skill development**

<b>I-BBM</b>	<b>FINANCIAL ACCOUNTING I</b>	<b>BM101A</b>
<b>SEMESTER – I</b>		<b>HRS/WK -5</b>
<b>CORE – 1</b>		<b>CREDIT –5</b>

<b>Learning Objectives</b>		
LO1	To understand the basic accounting concepts and standards.	
LO2	To know the basis for calculating business profits.	
LO3	To familiarize with the accounting treatment of depreciation.	
LO4	To learn the methods of calculating profit for single entry system.	
LO5	To gain knowledge on the accounting treatment of insurance claims.	
Prerequisites: Should have studied Accountancy in XII Std		
Unit	Contents	No. of Hours
I	<b>Fundamentals of Financial Accounting</b> Financial Accounting – Meaning, Definition, Objectives, Basic Accounting Concepts and Conventions - <b>Journal, Ledger Accounts– Subsidiary Books –</b> Trial Balance - Classification of Errors – Rectification of Errors – Preparation of Suspense Account	15
II	<b>Final Accounts</b> Final Accounts of Sole Trading Concern- Capital and Revenue Expenditure and Receipts – <b>Preparation of Trading, Profit and Loss Account and Balance Sheet with Adjustments.</b>	15
III	<b>Depreciation and Bills of Exchange</b> Depreciation - Meaning – Objectives – Accounting Treatments - Types - Straight Line Method – Diminishing Balance method. Bills of Exchange – Definition – Specimens – Discounting of Bills – Endorsement of Bill – Collection – Noting – Renewal – Retirement of Bill under rebate	15

IV	<b>Accounting from Incomplete Records – Single Entry System</b> Incomplete Records -Meaning and Features - Limitations - Difference between Incomplete Records and Double Entry System - Methods of Calculation of Profit - <b>Statement of Affairs Method – Preparation of final statements by Conversion method.</b>	15
V	<b>Royalty and Insurance Claims</b> Meaning – Minimum Rent – Short Working – Recoupment of Short Working – Lessor and Lessee – Sublease – Accounting Treatment. Insurance Claims –Calculation of Claim Amount-Average clause (Loss of Stock only)	15
TOTAL		75
<b>THEORY 20% &amp; PROBLEM 80%</b>		
<b>CO</b>	<b>Course Outcomes</b>	
<b>CO1</b>	Remember the concept of rectification of errors and Bank reconciliation statements	
<b>CO2</b>	Apply the knowledge in preparing detailed accounts of sole trading concerns	
<b>CO3</b>	Analyse the various methods of providing depreciation	
<b>CO4</b>	Evaluate the methods of calculation of profit	
<b>CO5</b>	Determine the royalty accounting treatment and claims from insurance companies in case of loss of stock.	
<b>Textbooks</b>		
<b>1.</b>	S. P. Jain and K. L. Narang Financial Accounting- I, Kalyani Publishers, New Delhi.	
<b>2.</b>	S.N. Maheshwari, Financial Accounting, Vikas Publications, Noida.	
<b>3.</b>	ShuklaGrewal and Gupta, “Advanced Accounts”, volume 1, S.Chand and Sons, New Delhi.	
<b>4.</b>	Radhaswamy and R.L. Gupta: Advanced Accounting, Sultan Chand, New Delhi.	

5.	R.L. Gupta and V.K. Gupta, “Financial Accounting”, Sultan Chand, New Delhi.
<b>Reference Books</b>	
1.	Dr.Arulanandan and Raman: Advanced Accountancy, Himalaya Publications, Mumbai.
2.	Tulsian , Advanced Accounting, Tata McGraw Hills, Noida.
3.	Charumathi and Vinayagam, Financial Accounting, S.Chand and Sons, New Delhi.
4.	Goyal and Tiwari, Financial Accounting, Taxmann Publications, New Delhi.
5.	Robert N Anthony, David Hawkins, Kenneth A. Merchant, Accounting: Text and Cases. McGraw-Hill Education, Noida.
<b>NOTE: Latest Edition of Textbooks May be Used</b>	
<b>Web Resources</b>	
1.	<a href="https://www.slideshare.net/mcsharma1/accounting-for-depreciation-1">https://www.slideshare.net/mcsharma1/accounting-for-depreciation-1</a>
2.	<a href="https://www.slideshare.net/ramusakha/basics-of-financial-accounting">https://www.slideshare.net/ramusakha/basics-of-financial-accounting</a>
3.	<a href="https://www.accountingtools.com/articles/what-is-a-single-entry-system.html">https://www.accountingtools.com/articles/what-is-a-single-entry-system.html</a>

**MAPPING WITH PROGRAMME OUTCOMES  
AND PROGRAMME SPECIFIC OUTCOMES**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
<b>CO1</b>	3	2	3	3	2	3	2	2	3	2	2
<b>CO2</b>	3	2	3	3	3	2	2	2	3	2	2
<b>CO3</b>	3	2	3	3	3	2	2	2	3	2	2
<b>CO4</b>	3	2	3	3	2	2	2	2	3	2	2
<b>CO5</b>	3	2	3	3	3	2	2	2	3	2	2
<b>TOTAL</b>	15	10	15	15	13	11	10	10	15	10	10
<b>AVERAGE</b>	3	2	3	3	2.6	2.2	2	2	3	2	2

**3 – Strong, 2- Medium, 1- Low**

**Question pattern**

**Continuous Internal Assessment (CIA) 25marks**

1. Two Internal Examinations	15 marks
2. Assignment/ Seminar	5 marks
3. Attendance	5 marks
<b>Total</b>	<b>25 marks</b>

**Semester Examination (75 marks)**

**Time: 3 Hours**

**Marks: 75**

**Part – A (10x2 =20) Marks**

**Answer all the Questions**

Two questions from each unit

**Part – B (5x5 = 25)**

**Answer ANY FIVE out of SEVEN**

One question from each unit and two questions from important topics

**Part – C (3x10 = 30)**

**Answer Any THREE out of FIVE**

One question from each unit

**Question Paper Pattern For Problem Papers**

Theory: 20%    Problems: 80%

<b>I-BBM</b>	<b>PRINCIPLES OF MANAGEMENT</b>	<b>BM102A</b>
<b>SEMESTER – I</b>		<b>HRS/WK -5</b>
<b>CORE – 2</b>		<b>CREDIT –5</b>

<b>Learning Objectives</b>		
<b>LO1</b>	To understand the basic management concepts and functions	
<b>LO2</b>	To know the various techniques of planning and decision making	
<b>LO3</b>	To familiarize with the concepts of organisation structure	
<b>LO4</b>	To gain knowledge about the various components of staffing	
<b>LO5</b>	To enable the students in understanding the control techniques of management	
<b>Prerequisites: Should have studied Commerce in XII Std</b>		
<b>Unit</b>	<b>Contents</b>	<b>No. of Hours</b>
I	<p><b>Introduction to Management</b></p> <p>Meaning- Definitions – Nature and Scope - Levels of Management – Importance - Management Vs. Administration – Management: Science or Art –Evolution of Management Thoughts – F. W. Taylor, Henry Fayol,</p> <p>Peter F. Drucker, Elton Mayo - Functions of Management - Trends and Challenges of Management. Managers – Qualification – Duties &amp; Responsibilities.</p>	<b>15</b>
II	<p><b>Planning</b></p> <p>Planning – Meaning – Definitions – Nature – Scope and Functions – Importance and Elements of Planning – Types – Planning Process - Tools and Techniques of Planning – Management by Objective (MBO). Decision Making: Meaning – Characteristics – Types - Steps in Decision Making – Forecasting.</p>	<b>15</b>

III	<p><b>Organizing</b></p> <p>Meaning - Definitions - Nature and Scope – Characteristics – Importance – Types - Formal and Informal Organization – Organization Chart – Organization Structure: Meaning and Types - Departmentalization– Authority and Responsibility – <b>Centralization and Decentralization – Span of Management.</b></p>	<b>15</b>
IV	<p><b>Staffing</b></p> <p>Introduction - Concept of Staffing- Staffing Process – Recruitment – Sources of Recruitment – Modern Recruitment Methods - Selection Procedure – Test- Interview– Training: Need - Types– Promotion –Management Games – Performance Appraisal - Meaning and Methods – 360 degree Performance Appraisal – Work from Home - Managing Work from Home [WFH].</p>	<b>15</b>
V	<p><b>Directing</b></p> <p>Motivation –Meaning - Theories – Communication – Types - Barriers to Communications – Measures to Overcome the Barriers. <b>Leadership – Nature - Types and Theories of Leadership – Styles of Leadership - Qualities of a Good Leader</b> – Successful Women Leaders – Challenges faced by women in workforce - Supervision.</p> <p><b>Co-ordination and Control</b></p> <p>Co-ordination – Meaning - Techniques of Co-ordination.</p> <p><b>Control - Characteristics - Importance – Stages in the Control Process - Requisites of Effective Control and Controlling Techniques</b> – Management by Exception [MBE].</p>	<b>15</b>
<b>Total</b>		<b>75</b>
<b>Course Outcomes</b>		
<b>CO1</b>	Demonstrate the importance of principles of management.	
<b>CO2</b>	Paraphrase the importance of planning and decision making in an organization.	
<b>CO3</b>	Comprehend the concept of various authorizes and responsibilities of an organization.	
<b>CO4</b>	Enumerate the various methods of Performance appraisal	

<b>CO5</b>	Demonstrate the notion of directing, co-coordination and control in the management.
<b>Textbooks</b>	
1	Gupta.C.B, -Principles of Management-L.M. Prasad, S.Chand& Sons Co. Ltd, New Delhi.
2	DinkarPagare, Principles of Management, Sultan Chand & Sons Publications, New Delhi.
3	P.C.Tripathi& P.N Reddy, Principles of Management. Tata McGraw, Hill, Noida.
4	L.M. Prasad, Principles of Management, S.Chand&Sons Co. Ltd, New Delhi.
5	R.K. Sharma, Shashi K. Gupta, Rahul Sharma, Business Management, Kalyani Publications, New Delhi.
<b>Reference Books</b>	
1	K Sundhar, Principles Of Management, Vijay Nichole Imprints Limited, Chennai
2	Harold Koontz, Heinz Weirich, Essentials of Management, McGraw Hill, Sultan Chand and Sons, New Delhi.
3	Griffffin, Management principles and applications, Cengage learning, India.
4	H.Mintzberg - The Nature of Managerial Work, Harper & Row, New York.
5	Eccles, R. G. &Nohria, N. Beyond the Hype: Rediscovering the Essence of Management. Boston The Harvard Business School Press, India.
<b>NOTE: Latest Edition of Textbooks May be Used</b>	
<b>Web Resources</b>	
1	<a href="http://www.universityofcalicut.info/syl/management">http://www.universityofcalicut.info/syl/management</a>
2	<a href="https://www.managementstudyguide.com/manpower-planning.htm">https://www.managementstudyguide.com/manpower-planning.htm</a>
3	<a href="https://www.businessmanagementideas.com/notes/management-notes/coordination/coordination/21392">https://www.businessmanagementideas.com/notes/management-notes/coordination/coordination/21392</a>

**MAPPING WITH PROGRAMME OUTCOMES  
AND PROGRAMME SPECIFIC OUTCOMES**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2	PSO 3
<b>CO1</b>	3	2	2	3	3	2	2	2	3	2	3
<b>CO2</b>	3	2	3	3	2	2	2	2	3	2	2
<b>CO3</b>	3	2	2	3	2	2	2	1	3	2	2
<b>CO4</b>	3	2	2	3	2	2	2	2	3	2	2
<b>CO5</b>	3	2	3	3	2	2	2	1	3	2	2
<b>TOTAL</b>	15	10	12	15	11	10	10	8	15	10	11
<b>AVERAGE</b>	3	2	2.4	3	2.2	2	2	1.6	3	2	2.2

**3 – Strong, 2- Medium, 1-**

**Question pattern**

**Continuous Internal Assessment (CIA) 25marks**

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<b>Total</b>	<b>25 marks</b>

**Semester Examination (75 marks)**

**Time: 3 Hours**

**Marks: 75**

**Part – A (10x2 =20) Marks**

**Answer all the Questions**

Two questions from each unit

**Part – B (5x5 = 25)**

**Answer ANY FIVE out of SEVEN**

One question from each unit and two questions from important topics

**Part – C (3x10 = 30)**

**Answer Any THREE out of FIVE**

One question from each unit



<b>I-BBM</b>	<b>DIGITAL BANKING</b>	<b>NBM101</b>
<b>SEMESTER – I</b>		<b>HRS/WK -2</b>
<b>SEC-NME I</b>		<b>CREDIT –2</b>

<b>Learning Objectives:</b>	
<b>LO1:</b>	To acquaint students with knowledge of Digital Banking Products.
<b>LO2:</b>	To enable the students to understand the knowledge of Digital Payment System
<b>LO3:</b>	To impart the students to understand the new concepts of Mobile and Internet Banking
<b>LO4:</b>	To enables the students to have depth knowledge in point of sale terminals
<b>LO5:</b>	To understand the ATM and cash deposit system
<b>Course Outcomes:</b>	
	After the successful completion of the course, the students will be able to:
<b>CO1:</b>	Explain the need for digital banking products and the usage of cards.
<b>CO2:</b>	Classify the usage of various payment systems.
<b>CO3:</b>	Discuss the profit ability, risk management and frauds of Mobile and internet banking.
<b>CO4:</b>	Analyze the approval processes of POS terminals.
<b>CO5:</b>	Explain the product features and services of ATM and Cash Deposit Machine.

### **Unit I: Digital Banking Products**

**(6 Hours)**

Digital Banking –Meaning – Features - **Digital Banking Products** -Features - Benefits – Bank Cards –Features and Incentives of Bank cards - Types of Bank Cards -New Technologies- Europay,Master and Visa Card(EMV)-Tap and Go,Near Field Communication (NFC) etc. - Approval Processes for Bank Cards – Customer Education for Digital Banking Products –Digital Lending– Digital Lending Process-Non-Performing-Asset(NPA).

### **Unit II: Payment System**

**(6 Hours)**

Overview of Domestic and Global Payment systems -RuPay and RuPay Secure - ImmediatePaymentService(IMPS)–NationalUnifiedUSSDPlatform(NUUP)- NationalAutomatedClearingHouse(NACH)-AadhaarEnabledPaymentSystem(AEPS)–ChequeTruncation System (CTS) –Real Time Gross Settlement Systems (RTGS)–National Electronic Fund Transfer(NEFT) –Innovative Banking & Payment Systems.

**Unit III: Mobile and Internet Banking (6 Hours)**

Mobile & Internet Banking - Overview – Product Features and Diversity - Corporate and Individual Internet Banking Integration with e-Commerce Merchant sites, IMPS - Profitability - Risk Management and Frauds - **Cyber Crime - Cyber Security** – Blockchain Technology-Types- Crypto currency and Bitcoins

**Unit IV: Point of Sale Terminals (6 Hours)**

Point of Sale (POS) Terminals - Overview - Features - Approval processes for POS Terminals - Key Components of POS - Hardware - Software - User Interface Design – Cloud based Point of Sale – Cloud Computing-Benefits of POS in Retail Business.

**Unit V: Automated Teller Machine and Cash Deposit Systems (6 Hours)**

Automated Teller Machine(ATM) – Cash Deposit Machine(CDM)& Cash Recyclers - Overview - Features - ATM Instant Money Transfer Systems - National Financial Switch (NFS) -Various Value Added Services - Proprietary, Brown Label and White Label ATMs - ATM & CDM Network Planning - Onsite / Offsite - ATM security, Surveillance and Fraud Prevention.

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**(6 Hours)**

Book-Keeping-Meaning -Definition –Objectives-Accounting-Meaning –Definition-Objectives-Importance-Functions-Advantages-Limitations-Methods of Accounting-Single Entry Double Entry-Steps involved in double entry system-Advantages of double entry system-Meaning of Debit and Credit-Types of Accounts and its rules-Personal Accounts-Real Accounts-Nominal Accounts.

### Unit III Marketing and Advertising

**(6 Hours)**

Meaning of Marketing-Definition-Functions of Marketing-Meaning of Consumer – Standardization and Grading -Pricing –Kinds of Pricing -AGMARK-ISI-Advertising: Meaning, Characteristics, Advertising Objectives, Advertising Functions Advantages of advertising, Kinds of Advertising, Advertising Media, Kinds of media

### Unit IV Auditing & Entrepreneurial Development

**(6 Hours)**

Introduction of Auditing -Origin and Evolution –Definition -Features of Auditing -Objectives of Auditing Advantages of Audit -Limitations of Auditing -Distinction between Auditing & Investigation -Distinction between Accounting & Auditing –Basic Principles of Audit-

Classification of Audit- Entrepreneurial Development-Characteristics of an entrepreneur-  
Functions of an entrepreneur-Types of an entrepreneur -Problems of Women entrepreneur-  
Concept of Women Entrepreneurs

**Unit V: Income Tax Law and Practice**

**6 Hours**

Tax history-Types –Various Terms in Tax-Exempted Income U/S 10-Canons of Taxation-  
Income Tax Authority and Administration-Slab Rate –Filing of Returns-Residential Status.

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<b>I-BBM</b>	<b>FINANCIAL ACCOUNTING II</b>	<b>BM203A</b>
<b>SEMESTER – II</b>		<b>HRS/WK -6</b>
<b>CORE – 3</b>		<b>CREDIT –4</b>

**Objective:**

To enable the students to acquire knowledge in preparation of Branch, Department and Partnership accounts.

**COURSE OUTCOMES (COs)**

**CO1:** To Calculate the average due date and account current.

**CO2:** To understand the allocation of expenses under departmental accounts.

**CO3:** To gain an understanding about partnership accounts relating to admission and retirement.

**CO4:** To acquire knowledge regarding Partnership Accounts relating to dissolution of firm.

**CO5:** To gain an knowledge on IFRS.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcome**

SEMESTER	COURSE CODE		COURSE TITLE										HO UR S	CREDI T
II	BM203A		FINANCIAL ACCOUNTING- II										6	4
COURSE OUTCOM ES	PROGRAMME OUTCOME (PO)					PROGRAMME SPECIFIC OUTCOME (PSO)								MEAN SCORE OF CO'S
	P O1	PO 2	PO 3	PO4	PO 5	PS O1	PS O2	PS O3	PS O4	PS O5	PS O6	PS O7	PS O8	
CO1	5	4	5	3	3	5	5	3	3	4	5	5	3	4.1
CO2	4	5	5	4	3	5	5	3	3	4	5	5	2	4.1
CO3	4	5	4	4	3	5	4	4	4	3	5	4	3	4.0
CO4	5	5	4	4	4	5	4	3	3	3	5	2	2	3.7
CO5	4	4	4	4	4	5	4	4	3	3	5	2	2	3.6
<b>Mean Overall Score</b>													<b>3.9</b>	

**.Result: The score of this course is 3.9 (High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **High** Association with Programme Outcome and Programme Specific Outcome

**UNIT 1 (17 Hrs)**

**Average Due Date And Account Current:** Average Due Date-meaning of Average due date-  
Uses of Average due date-basic problems in average due date-calculation of interests-account  
current-counting of days-methods of calculating interests-simple problems

#### **UNIT 2(20Hrs)**

**Branch and Departmental Accounts** :Branch – Dependent Branches: Accounting Aspects -  
Debtors system -Stock and Debtors system – Distinction between Wholesale Profit and Retail  
Profit – Independent Branches (Foreign Branches excluded) - Departmental Accounts: Basis of  
Allocation of Expenses – Inter- Departmental Transfer at Cost or Selling Price

#### **UNIT 3(20 Hrs)**

**Partnership Accounts - I** :Partnership Accounts: –Admission of a Partner – Treatment of  
Goodwill - Calculation of Hidden Goodwill –Retirement of a Partner – Death of a Partner.

#### **UNIT 4 (18 Hrs)**

**Partnership Accounts - II** :Dissolution of Partnership - Methods – Settlement of Accounts  
Regarding Losses and Assets – Realization account – Treatment of Goodwill – Preparation of  
Balance Sheet - One or more Partners insolvent – All Partners insolvent – Application of Garner  
Vs Murray Theory – Accounting Treatment - Piecemeal Distribution –Maximum Loss Method

#### **UNIT 5 (15Hrs)**

**Accounting Standards for Financial Reporting (Theory only):** Objectives and uses of  
Financial Statements for users - Roll of Accounting Standards - Development of Accounting  
Standards in India - Role of IFRS - IFRS Adoption vs Convergence Implementation Plan in  
India - Ind AS - An introduction - Difference between Ind AS and IFRS

#### **THEORY 20% & PROBLEMS 80%**

##### **Textbooks**

1. T.S. Reddy& A. Murthy, Financial Accounting, Margam Publishers,Chennai, 6<sup>th</sup> Revised Edition, 2021.
2. S P Jain and K. L. Narang: Financial Accounting- I, Kalyani Publishers, New Delhi, 12<sup>th</sup> Edition, 2019.

##### **Reference Books**

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4. S.N. Maheswari & S.K. Maheswari, Financial Accounting, Vikas Publishing House Pvt. Ltd., New Delhi, 2018.
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One question from each unit and two questions from important topics

**Part – C (3x10 = 30)**

**Answer Any THREE out of FIVE**

One question from each unit

**Question Paper Pattern For Problem Papers**

Theory: 20%    Problems: 80%



<b>I-BBM</b>	<b>BUSINESS LAW</b>	<b>BM204A</b>
<b>SEMESTER – II</b>		<b>HRS/WK -6</b>
<b>CORE – 4</b>		<b>CREDIT –4</b>

**Objective:**

To understand the various laws and provisions relating to contract, bailment, pledge and sale of goods Act.

**COURSE OUTCOMES(COs)**

**CO1:**To know the nature and objectives of Mercantile law and the essentials of valid contract.

**CO2:**To gain knowledge on performance contracts.

**CO3:**To be acquainted with the rules of Indemnity and Guarantee .

**CO4:**To make aware of the essentials of bailment and pledge.

**CO5:**To understand the provisions relating to sale of goods.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER	COURSE CODE	COURSE TITLE:												HOURS	CREDIT
II	BM204A	BUSINESS LAW												6	4
COURSE OUTCOMES	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)								MEAN SCORE OF CO'S	
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CO4	4	4	4	3	4	4	3	5	4	4	4	3	4	3.8	
CO5	5	3	4	4	3	3	4	3	3	4	3	4	4	4.3	
<b>Mean Overall Score</b>														<b>3.8</b>	

**Result: The score of this course is 3.8 (High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
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Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **High** association with Programme Outcomes and Programme Specific Outcome

**UNIT 1**

**(20 Hrs)**

**Elements of Contract Indian Contract Act 1872:** Definition of Contract, Essentials of Valid Contract, Classification of Contract, Offer and Acceptance – Consideration – Capacity to Contract – Free Consent - Legality of Object – Contingent Contracts – Void Contract

## UNIT 2

(17 Hrs)

**Performance of Contract :** Meaning of Performance, Offer to Perform, Devolution of Joint liabilities & Rights, Time and Place of Performance, Reciprocal Promises, Assignment of Contracts - Remedies for Breach of contract - Termination and Discharge of Contract - Quasi Contract

## UNIT 3

(15 Hrs)

**Contract of Indemnity and Guarantee** **Contract of Indemnity** and Contract of Guarantee - Extent of Surety's Liability, Kinds of Guarantee, Rights of Surety, Discharge of Surety

## UNIT 4

(20 Hrs)

**Bailment and Pledge :** Bailment and Pledge – Bailment – Concept – Essentials - Classification of Bailments, Duties and Rights of Bailor and Bailee – Law of Pledge – Meaning – Essentials of Valid Pledge, Pledge and Lien, Rights of Pawner and Pawnee.

## UNIT 5

(18 Hrs)

**Sale of Goods Act 1930:** Definition of Contract of Sale – Formation - Essentials of Contract of Sale - Conditions and Warranties - Transfer of Property – Contracts involving Sea Routes - Sale by Non-owners - Rights and duties of buyer - Rights of an Unpaid Seller

### Textbooks

1. N.D. Kapoor, Dr. Rajni Abbi , Bharat Bhushan, Rajiv Kapoor, *Business Laws*, Sultan Chand & Sons (P) Ltd, Revised Edition, 2019.
2. R.S.N. Pillai and Bagavathi, *Business Law-S.Chand & Company Ltd*, Third Edition, 2010 .

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1. PreethiAgarwal, *Business Laws, CA foundation study material*, Chennai, 2022.
2. P. Saravanavel & S. Sumathi, *Legal Aspects of Business*, Eswar Press, First Edition, 2012
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**Part – A (10x2 =20) Marks**

**Answer all the Questions**

Two questions from each unit

**Part – B (5x5 = 25)**

**Answer ANY FIVE out of SEVEN**

One question from each unit and two questions from important topics

**Part – C (3x10 = 30)**



**Answer Any THREE out of FIVE**

One question from each unit

<b>II-BBM</b>	<b>CORPORATE ACCOUNTING</b>	<b>BM306A</b>
<b>SEMESTER – III</b>		<b>HRS/WK -7</b>
<b>CORE – 6</b>		<b>CREDIT –5</b>

**Objective:**

To enable the students to understand the basic concepts relating to issue, redemption of shares, to prepare company final accounts and acquisition of business.

**COURSE OUTCOMES (COs):**

**CO1:** To understand the company law provisions and procedures of issue and redemption of shares to the public and able to pass journal entries of the issue in the books of the company

**CO2:** To gain knowledge to pass journal entries, preparing balance sheet of a company when it purchases the business of a sole trader and partnership and ability to calculate profit prior to incorporation.

**CO3:** To familiarise with company law provisions relating to schedules and final accounts of the company and able to prepare profit and loss accounts and balance sheet of company.

**CO4:** To acquire ability to prepare liquidators final statements when the company close its business and understand the winding up procedure and various modes of winding up of a company.

**CO5:** To acquaint with banking law provisions relating to bank’s final accounts and gain ability to prepare schedules, profit and loss account and balance sheet of the banks.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER	COURSE CODE	COURSE TITLE:											HOURS	CREDIT
III	BM306A	CORPORATE ACCOUNTING											7	5
COURSE OUTCOMES (COs)	PROGRAMME OUTCOMES (POs)					PROGRAMME SPECIFIC OUTCOMES (PSOs)								MEAN SCORE OF COs
	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO8	
CO1	4	5	4	5	4	5	4	5	3	4	5	5	3	4.3
CO2	4	5	4	3	3	5	4	4	3	4	5	3	2	3.7
CO3	5	5	5	4	2	5	5	5	3	4	5	5	2	4.2
CO4	4	4	3	3	2	5	5	4	3	4	5	5	2	3.7
CO5	4	5	4	4	3	5	5	5	2	4	5	5	3	4.1
Mean Overall Score													<b>4.0</b>	

**Result: the score of this course is 4.0 (High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **High Association** with programme outcomes and programme specific outcome

**UNIT -I** ( 25 hrs)

**Issue and Redemption of Shares:** Introduction-Meaning-Definition-Features- Kinds of Components-Under Subscription and Over Subscription-Issue of shares at par-At Premium-At - Discount-Calls-in-arrears-Calls-in-advance-Forfeiture of Shares-Reissue of Forfeited shares-Balance Sheet . (Revised Schedule VI). Redemption - at par out of profit -at premium out of profit -Partly out of profit and party out of fresh issue.

**UNIT-II** (20 hrs)

**Acquisition of Business:** Meaning-When new set of books are opened-Purchase consideration - Net asset method-Net payment method-Debtors and Creditors taken over on behalf of vendors - Profits prior to incorporation -Meaning-Methods of Ascertaining profit or loss Prior to Incorporation-Basis of Apportionment of Expenses.

**UNIT- III** (20 hrs)

**Final Accounts Of Companies:** Introduction-Statement of profit and loss- (Part II of Revised Schedule VI)-Balance Sheet- (Part I of Revised Schedule VI)-Managerial Remuneration.

**UNIT – IV** (20 hrs)

**Liquidation of Companies:** Meaning of liquidation or winding up – Modes of winding up – winding up by the Court, Compulsory, Voluntary, Members, Creditors – Order of Payment – Secured Creditors – Preferential Creditors – Liquidator’s Final Statement of accounts.

**UNIT-V** (20 hrs)

**Bank Accounts:**Bank-Meaning-Legal requirements-Preparation of profit and loss accounts (Form ‘B’ of Schedule III) and Balance Sheet (Form ‘A’ of Schedule III).

**Text Books:**

1. T.S. Reddy & A. Murthy -Corporate Accounting – Volume 2 (As Per Revised Schedule VI In New Format)-Publisher: Margham Publications-2020
2. R.L.Gupta and M.Radhaswamy“Advanced Accountancy” (Volume I)Sultan Chand& Sons-New Delhi, January ,2013

**Reference Books:**

1. S.P.Jain and K.L.Narang-Corporate Accounting (Volume I) -Kalyani Publishers-Ludhiana-19th Revised Edition- 2019
2. .M.A. Arulanandam& K.S. Raman, “Advanced Accountancy” Vol-I, Sixth Edition, 2015, Himalaya Publishing House, Mumbai.
3. .Dr.S.N. maheswariCasharad K .maheswari ,& Dr. sunilK.Maheswari – Corporate accounting - Vikas Publications 6<sup>th</sup> edition- 2018

<b>II-BBM</b>	<b>COST ACCOUNTING</b>	<b>BM409A</b>
<b>SEMESTER – IV</b>		<b>HRS/WK -7</b>
<b>CORE – 8</b>		<b>CREDIT - 5</b>

**Objective:**

To familiarize the students on the use of cost accounting system in different nature of businesses

**COURSE OUTCOMES (COs):**

**CO1:**To acquire knowledge of the basic concepts of cost, costing methods and able to prepare cost sheet of product and service to determine cost of production and fixing selling price.

**CO2:** To develop ability to maintain to keep store ledger, fixing stock level and economic order quantity and determine the price at which materials issued to the production centre.

**CO3:** To understand the primary and secondary distribution of overheads to different production and service departments and to know how the overheads charged to a product/service.

**CO4:**Toacquire knowledge in preparing contract account and able to calculate profit of each contract.

**CO5:** To acquaint a skill of critical and rational thinking, and understanding the procedures of Process Costing.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER	COURSE CODE	COURSE TITLE:												HOURS	CREDIT
IV	BM409A	COST ACCOUNTING												7	5
COURSE OUTCOMES	PROGRAMME OUTCOME (PO)					PROGRAMME SPECIFIC OUTCOME (PSO)								MEAN SCORE OF COs	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8		
CO1	5	5	4	4	3	5	5	4	3	4	5	4	4	4.2	
CO2	4	4	4	3	3	5	4	4	3	4	5	3	3	3.7	
CO3	4	4	4	3	3	5	4	4	3	4	5	3	3	3.7	
CO4	5	5	4	4	4	5	5	4	5	3	5	4	2	4.2	
CO5	4	5	4	3	3	5	5	3	3	3	5	5	3	3.9	
Mean Overall Score														<b>3.9</b>	

**Result: the score of this course is 3.9 (High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **High** associationwithProgramme Outcomes and Programme Specific Outcome.

**UNIT -I****(20 Hrs)**

**Cost Sheet:** Cost accounting – Meaning – definition – objectives – advantages – limitations – methods of costing – types of costing – differences between cost accounting, management accounting and financial accounting -Cost – Element of cost– meaning – definition– cost sheet– Meaning – Preparation of cost sheet – tenders and quotation.

**UNIT – II****(25 Hrs)**

**Material Costing:** Material control - Meaning objectives – need – advantages - Inventory control and its techniques – Stock levels and EOQ- methods of pricing material issues – FIFO – LIFO – HIFO – Simple average method – Weighted average method – Standard price method – Base stock method.

**UNIT - III****(20 Hrs)**

**Overheads:** Overheads -meaning – definitions – importance – classifications – primary distribution– secondary distribution of overheads – machine hour rate computation.

**UNIT-IV****(22 Hrs)**

**Contract Costing:** Meaning, features of contract costing, Applications of contract costing, similarities and dissimilarities between job and contract costing, procedure of contract costing, profit on incomplete contracts, Problems.

**UNIT- V****(18 Hrs)**

**Process Costing:** Meaning – Characteristics – Types of Industries using Process Costing – Advantages – Disadvantages – Difference between Process Costing and Job Costing – Process Costing Procedure.(Simple Process Account Only)

**Text Books :**

1. Ts.Reddy, Y.Hariprasad Reddy – Cost Accounting – Margam Publications – 2017.
2. A.Murthy& S. Gurusamy – Cost Accounting – TATA McGraw Hill publishing co Ltd- 2<sup>nd</sup> edition – 2009.

**Reference Books:**

1. MN.Arrora – Cost Accounting – Vikas Publishing House Pvt Ltd- 3<sup>rd</sup> edition – 2019.
2. V. Rajesh Kumar, RK. Sreekantha- Cost Accounting- McGraw Hill Education Pvt Ltd – 2018.
3. Dr. SN Maheswari,Dr.S.N.Mittal – Cost Accounting: Theory and problems –Shree Mahavir Book Depot(Publishers) – 2008.

<b>III – BBM</b>	<b>INCOME TAX LAW AND PRACTICE</b>	<b>CODE –BM501B</b>
<b>SEMESTER – V</b>		<b>HRS/WK – 7</b>
<b>CORE –9</b>		<b>CREDIT – 5</b>

**Objective:**

To enable the students to understand basic concepts and to compute the income of individuals under various heads of income.

**COURSE OUTCOMES (COs):**

**CO1:** To enlighten with the basic concepts related to Income Tax and Residential Status.

**CO2:** To obtain the knowledge on the computation of Income on Salaries.

**CO3:** To procure skills related to the computation of Income from House Property.

**CO4:** To understand the procedures and techniques for computing income from Business and related deductions and depreciation thereof.

**CO5:** To acquire knowledge on the methods of computation of Income from Capital Gains, other sources and computation of tax liability of individuals

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER	COURSE CODE	COURSE TITLE											HOURS	CREDIT
V	BM501B	INCOME TAX LAW AND PRACTICE											7	5
COURSE OUTCOMES (COs)	PROGRAMME OUTCOMES (POs)					PROGRAMME SPECIFIC OUTCOMES (PSOs)								MEAN SCORE OF COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	
CO1	4	4	3	3	3	4	4	5	3	3	4	3	3	3.5
CO2	3	4	3	4	4	3	5	3	4	3	4	3	3	3.5
CO3	4	3	5	4	3	4	3	4	3	4	4	3	4	3.6
CO4	3	4	3	3	4	3	4	3	5	3	3	4	4	3.5
CO5	3	3	4	4	3	5	3	4	4	3	3	3	3	3.4
Mean Overall Score													<b>3.5</b>	

**Result: the score of this course is 3.5 (High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **High** association with Programme Outcomes and Programme Specific Outcomes

**UNIT – I** (15 Hrs)

**Introduction And Residential Status:** Concepts of Assessment Year, Previous Year, Person, Assessee, Income, Gross Total Income – Total Income – Residential status – Exempted Income – Agricultural Income

**UNIT – II** (25 Hrs)

**Income From Salaries:** Computation of Salary Income – Taxable Allowances, Perquisites and Profit in lieu of salary.

**UNIT – III** (20 Hrs)

**Income From House Property:** Computation of Income from House Property – Annual value – Deductions.

**UNIT – IV** (21 Hrs)

**Profits And Gains Of Business Or Profession:** Profits & Gains from business or Profession – Expressly allowed and disallowed – deductions – Depreciation (Theory Only)– Block of assets ( theory only).

**UNIT – V** (24 Hrs)

**Capital Gains And Income From Other Sources:** Income from Capital gains – deductions and exemptions – Income from other sources – Grossing up of interest – Deemed Income – Set off and Carry forward of Losses – Deductions u/s 80C to 80U- Computation of Tax liability of an Individual.

**Text Books:**

1. Dr. A. Murthy, Income Tax Law and Practice, Vijay Nicole Imprints Private Limited, Chennai.
2. T. S. Reddy , Hari Prasad Reddy- Income tax law and practice , Margam Publications, Chennai

**Reference Books:**

1. Dr. Vinod K Singhania—Monica Singhania- Students Guide To Income Tax, Taxmann Publications, New Delhi.
2. Dr. H. C. Mehrotra- Income Tax Law & Practice, Sri Venkateswara Publication, Chennai.

<b>III – BBM</b>	<b>ENTREPRENEURIAL DEVELOPMENT</b>	<b>CODE: BM503B</b>
<b>SEMESTER -V</b>		<b>HRS/WK – 6</b>
<b>CORE- 1I</b>		<b>CREDIT - 5</b>

### Objective

To impart basic entrepreneurial skills and understandings to run a small business efficiently.

### COURSE OUTCOMES (CO's):

**CO1:** To understand the basic concepts and theories of entrepreneurship.

**CO2:** To exemplify knowledge on course contents, curriculum and constraints of EDP.

**CO3:** To conceive business ideas and convert them into business projects.

**CO4:** To learn the MSMEs schemes provided to budding entrepreneurs

**CO5:** To become familiar with institutions support various forms of assistances and subsidies.

### Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester	Course Code	Course Title												Hours	Credit
V	BM503B	Entrepreneurial Development												6	5
Course Outcomes (COS)	Programme Outcomes (PO's)					Programme Specific Outcomes (PSO's)								Mean Score Of CO'S	
	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8		
CO1	5	4	5	4	5	4	5	4	5	4	5	4	3	4.38	
CO2	4	4	4	5	4	5	4	3	3	2	4	5	5	4.08	
CO3	5	5	3	4	5	5	3	5	2	5	4	5	3	4.15	
CO4	3	4	3	4	5	4	4	3	4	4	5	5	5	4.08	
CO5	3	3	4	5	5	4	4	5	5	4	5	4	5	4.31	
												<b>Mean Overall Scores</b>		<b>4.20</b>	

**Result: The Score of this Course is 4.20 (Very High)**



Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	$0 \leq \text{rating} \leq 1$	$1.1 \leq \text{rating} \leq 2$	$2.1 \leq \text{rating} \leq 3$	$3.1 \leq \text{rating} \leq 4$	$4.1 \leq \text{rating} \leq 5$
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **Very High** association with Programme Outcome and Programme Specific Outcome.

#### UNIT -I (20 Hrs)

**Introduction to Entrepreneurship:** Entrepreneurship: Meaning- Nature-Importance-Theories- Entrepreneur: Meaning-Definition-Characteristics-Qualities- Classification of Entrepreneurs - Roles of an Entrepreneur-Entrepreneur vs Intrapreneur - Women Entrepreneur: Concept and Definition - Problems of Women Entrepreneurs - Factors Promoting an Entrepreneur - Factors affecting Entrepreneurial Growth in India - Role of entrepreneurs in India's Economic Development

#### UNIT -II (15 Hrs)

**Entrepreneurship Development Programmes:** Meaning-Needs-Objectives –Course Contents and Curriculum-Phases of EDP-Problems and Constraints of EDP- Organizations providing Entrepreneurship Development Programmes– Entrepreneurial Ecosystem.

#### UNIT -III (20 Hrs)

**New Venture:** Meaning – Promoting New Venture –Sources of Business Ideas - Idea Generation Techniques-Sources of Product for Business - Prefeasibility Study - Criteria for Selection of Product - Procedures to Start a New Venture- Start-up – Need for Start-up- Business Plan for Starts up – Contents and Evaluation Criteria – Unicorn - Decacorn.

#### UNIT -IV (15 Hrs)

**Managing MSME:** Classification of Enterprises- Memorandum of MSMEs-Registration of MSMEs- MUDRA Scheme, Prime Minister's Employment Generation Programme (PMEGP), STAND-UP INDIA and START-UP INDIA, Sickness in small Business - Preventing Sickness and Rehabilitation of Business Units.

#### UNIT –V (20 Hrs)

**Resource Mobilization Institutional Support and Subsidies :** Resource Mobilization- Financial resources-Human resources-Material-Physical resources - Sources of Raising Funds for an Entrepreneur (traditional and modern sources)- Angel Investors-Venture Capital - Various Institutions supporting Entrepreneurial growth - Incentives and Subsidies: Meaning-Needs-Incentives and Subsidies available to Entrepreneurs– DIC- Industrial Estates – Business Incubators

**Text Books:**

1. Dr.S.S.Khanka, Entrepreneurial Development, Sultan Chand Company Ltd.
2. C.B. Gupta&N.P. Sreenivasan: Entrepreneurial Development, Sultan Chand.

**Reference Books:**

1. PoornimaM.Charantimath ,Entrepreneurship Development & Small Business Enterprises – Second Edition, , Pearson
2. Prasanna Chandra: Project Planning, Analysis, Selection, Implementation and Review, Tata McGraw Hill.
3. Vasantha Desai: Dynamics of Entrepreneurial Development, Himalaya.
4. P.Saravanel, Entrepreneurial Development, Ess Pee kayPublishing House, Chennai - 1997.

<b>III-BBM</b>	<b>CUSTOMER RELATIONSHIP MANAGEMENT IN BANKING</b>	<b>CODE- BM601A</b>
<b>SEMESTER - VI</b>		<b>HRS/WK -6</b>
<b>CORE – 12</b>		<b>CREDIT -5</b>

**Objective:**

To provide insight on the organizational need, benefits and process of creating long-term value for individual customers through expertise in banking and technology.

**COURSE OUTCOMES (COs):**

**CO1: To familiarize the Basic Concepts about the Customer Relationship Management.**

**CO2: To attaining the knowledge about E- CRM.**

**CO3: To securing the significance of Customer satisfaction and its outcomes.**

**CO4: To acquainting the need of CRM in Banking.**

**CO5: To acknowledging the impact of CRM Technology in Banking.**

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER	COURSE CODE	COURSE TITLE												HOURS	CREDIT
VI	BM601A	CUSTOMER RELATIONSHIP MANAGEMENT IN BANKING												6	5
COURSE OUTCOMES	PROGRAMME OUTCOMES (POs)					PROGRAMME SPECIFIC OUTCOMES (PSOs)								MEAN SCORE OF CO'S	
	PO 1	PO 2	PO 3	PO 4	PO 5	PS O1	PS O2	PS O3	PS O4	PS O5	PS O6	PS O7	PSO 8		
CO1	4	3	4	4	5	3	4	4	3	3	3	3	3	3.5	
CO2	3	3	4	3	4	3	5	4	4	4	4	3	4	3.6	
CO3	3	3	3	5	3	4	3	3	4	3	4	3	3	3.3	
CO4	4	3	3	3	4	5	3	3	3	4	3	4	3	3.4	
CO5	3	4	4	4	4	5	3	4	3	4	3	4	3	3.6	
<b>Mean Overall Score</b>														<b>3.4</b>	

**Result: The score of this course is 3.4 (High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **High** association with Programme Outcomes and Programme Specific Outcomes.

#### **UNIT – I**

**(20 Hrs)**

**CRM:** Customer Relationship Management (CRM): Meaning – Definitions– Objectives – Benefits – Advantages and Disadvantages – Types – CRM Cycle – Necessity for adoption in CRM – Implementation of CRM – Reasons and failure of CRM.

#### **UNIT – II**

**(20 Hrs)**

**E-CRM:** Electronic Customer Relationship Management (E-CRM): Meaning -Definition – Features – Advantages and Disadvantages –Difference between CRM and E-CRM – Components and Challenges of E-CRM.

#### **UNIT – III**

**(15 Hrs)**

**Customer Satisfaction:** Meaning – Definition – Significance – Components – Factors affecting Customer satisfaction. Customer Delight: Meaning – Purpose – Principles–Difference between Customer Satisfaction and Customer Delight.

#### **UNIT – IV**

**(15 Hrs)**

**CRM in Banking:** Origin– Impact– Need– Benefits –Banking Challenges solved by CRM – Factors determining CRM in Banking – CRM as a Bank’s Sales Tool.

#### **UNIT – V**

**(20 Hrs)**

**CRM in Banking with Technology:** Components – Role –SWOT (Strength, Weakness, Opportunities, Threats) analysis on CRM technology – Artificial Intelligence – Meaning, AI-powered CRM platforms –AI for customer-centric approaches in Banking.

#### **Text Books:**

1. Customer Relationship Management, Dr. K. GovindaBhat, Himalaya Publishing House, Mumbai, 2016.
2. CRM Practices in Banking sector, Anuradha Reddy Malipatel, Ravi Akula, LAP Lambert Academic Publishing, India, 2019.

#### **Reference Books:**

1. Customer Relationship Management, P.P.Singh and JinendarKum, Regal publications, New Delhi, 2017.
2. Customer Relationship Management: Emerging concepts, tools, and applications, Jagdish N. Sheth, AtulParvatiyar, G.Shainesh, Tata Mcgraw-Hill Education, Noida, 2015.
3. Adoption and Implementation of AI in Customer Relationship Management, Surabhi Singh, Business Science Reference, United States, 2021.

**Question pattern**

**For Theory and problem papers**

**Continuous Internal Assessment (CIA) 25marks**

1. Two Internal Examinations	15 marks
2. Assignment/ Seminar	5 marks
3. Attendance	5 marks
<b>Total</b>	<b>25 marks</b>

**Semester Examination (75 marks)**

**Time: 3 Hours**

**Marks: 75**

**Part – A (10x2 =20) Marks**

**Answer all the Questions**

Two questions from each unit

**Part – B (5x5 = 25)**

**Answer ANY FIVE out of SEVEN**

One question from each unit and two questions from important topics

**Part – C (3x10 = 30)**

**Answer Any THREE out of FIVE**

One question from each unit

**Question Paper Pattern For Problem Papers**

Theory: 20%    Problems: 80%

<b>Year : I</b>	<b>PRINCIPLES OF MANAGEMENT</b>	<b>Hours / Week : 5</b>
<b>Semester : I</b>		<b>Credit : 4</b>
<b>Core Paper : 1</b>		<b>Code : BB101A</b>
<b>CIA - 25 Marks</b>		<b>External - 75 Marks</b>

<b>Course Learning Objectives</b>	
<b>CO 1</b>	To impart knowledge about evolution of management
<b>CO 2</b>	To provide understanding on planning process and importance of decision making in organization
<b>CO 3</b>	To learn the application of principles in organization
<b>CO 4</b>	To study the process of effective controlling in organization
<b>CO 5</b>	To familiarize students about significance of ethics in business and its implications.

<b>Unit</b>	<b>Course Contents</b>	<b>Number of hours</b>	<b>Learning Objectives</b>
<b>I</b>	Management: Importance – Definition – Nature and Scope of Management - Process – Role and Functions of a Manager – Levels of Management – Development of Scientific Management and other Schools of thought and approaches.	<b>15</b>	<b>CO 1</b>
<b>II</b>	<b>Planning:</b> Nature – Importance – Forms – Types – Steps in Planning – Objectives – Policies – Procedures and Methods – Natures and Types of Policies – Decision – making – Process of Decision – making – Types of Decision.	<b>15</b>	<b>CO 2</b>
<b>III</b>	<b>Organizing:</b> Types of Organizations – Organization Structure – Span of Control and Committees – Departmentalization – Informal Organization- Authority – Delegation – Decentralization – Difference between Authority and Power – Responsibility.	<b>15</b>	<b>CO 3</b>
<b>IV</b>	<b>Direction:</b> – Nature and Purpose. Co- ordination – Need, Type and Techniques and requisites for excellent Co- ordination – Controlling – Meaning and Importance – Control Process.	<b>15</b>	<b>CO 4</b>
<b>V</b>	Definition of Business ethics - Types of Ethical issues - Role and importance of Business Ethics and Values in Business - Ethics internal - Ethics External - Environment Protection - Responsibilities of Business	<b>15</b>	<b>CO 5</b>
<b>Total Hours</b>		<b>75</b>	

<b>Course Outcomes</b>		
<b>Course Outcomes</b>	On completion of this course, students will;	<b>Program Outcomes</b>
<b>CO1</b>	Describe nature, scope, role, levels, functions and approaches of management	PO5
<b>CO2</b>	Apply planning and decision making in management	PO2, PO5, PO6, PO8
<b>CO3</b>	Identify organization structure and various organizing techniques	PO1, PO4
<b>CO4</b>	Understand Direction, Co-ordination & Control mechanisms	PO2, PO6
<b>CO5</b>	Relate and infer ethical practices of organisation.	PO3, PO8

<b>Text Books</b>	
1	JAF Stoner, Freeman R.E and Daniel R Gilbert “Management”, 6th Edition, Pearson Education, 2004.
2	Griffin, T.O., Management, Houghton Mifflin Company, Boston, USA, 2014.
3	Stephen A. Robbins & David A. Decenzo & Mary Coulter, “Fundamentals of Management” 7th Edition, Pearson Education, 2011
4	Stoner, Freeman, Gilbert Jr. (2014). Management (6th edition), New Delhi: Prentice Hall India
5	Robbins, S., Coulter, M., Sidani, D., and Jamali, D., Management: Arab World Edition, Pearson, 2014.
<b>References Books</b>	
1	P.C. Tripathi & P.N Reddy; Principles of Management, Sultan Chand& Sons,6th Edition, 2017
2	L.M.Prasad; Principles & Practice of Management, Sultan Chand & Sons, 8 th Edition.
3	Stephen P. Robbins & Mary Coulter; Management, Pearson Education, 13th Edition, 2017
4	Dr.C.B.Gupta; Principles of Management, Sultan Chand& Sons, 3 rd Edition.
5	Harold Koontz, Hienz Weihrich, A Ramachandra Aryasri; Principles of Management, McGraw Hill, 2nd edition, 2015
<b>Web Resources</b>	
1	<a href="https://www.toolshero.com/management/14-principles-of-management/">https://www.toolshero.com/management/14-principles-of-management/</a>
2	<a href="https://open.umn.edu/opentextbooks/textbooks/693">https://open.umn.edu/opentextbooks/textbooks/693</a>
3	<a href="https://open.umn.edu/opentextbooks/textbooks/34">https://open.umn.edu/opentextbooks/textbooks/34</a>
4	<a href="https://openstax.org/subjects/business">https://openstax.org/subjects/business</a>
5	<a href="https://blog.hubspot.com/marketing/management-principles">https://blog.hubspot.com/marketing/management-principles</a>

**Mapping with program outcomes**

	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PO 6</b>	<b>PO 7</b>	<b>PO 8</b>
<b>CO 1</b>	M	L	S	S	S	S	M	S
<b>CO 2</b>	M	S	S	S	M	M	L	S
<b>CO 3</b>	M	S	S	M	S	S	M	S
<b>CO 4</b>	S	M	S	S	S	S	L	S
<b>CO 5</b>	M	S	S	S	S	S	M	S

<b>CO /PO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	3	3	3	3	3
<b>CO2</b>	3	3	3	3	3
<b>CO3</b>	3	3	3	3	3
<b>CO4</b>	3	3	3	3	3
<b>CO5</b>	3	3	3	3	3
<b>Weightage</b>	15	15	15	15	15
<b>Weighted percentage of Course Contribution to Pos</b>	3.0	3.0	3.0	3.0	3.0

**S –Strong    M-Medium    L-Low**

**CO-PO Mapping with program specific outcomes**



<b>Year : I</b>	<b>ACCOUNTING FOR MANAGEMENT</b>	<b>Hours / Week : 5</b>
<b>Semester : I</b>		<b>Credit : 4</b>
<b>Core Paper : 2</b>		<b>Code : BB102A</b>
<b>CIA - 25 Marks</b>		<b>External - 75 Marks</b>

<b>Course Learning Objectives</b>	
<b>CO 1</b>	To impart knowledge about basic concepts of accounting its applications
<b>CO 2</b>	To analyze and interpret financial reports of a company
<b>CO 3</b>	To understand the gross profit and net profit earned by organization
<b>CO 4</b>	To foster knowledge on Hire Purchase system
<b>CO 5</b>	To understand the procedures of Accounting under Single entry system.

<b>Unit</b>	<b>Course Contents</b>	<b>Number of hours</b>	<b>Learning Objectives</b>
<b>I</b>	Meaning and scope of Accounting, Basic Accounting Concepts and Conventions – Objectives of Accounting – Accounting Transactions – Double Entry Book Keeping – Journal, Ledger, Preparation of Trial Balance	<b>15</b>	<b>CO 1</b>
<b>II</b>	Subsidiary book – Preparation of cash Book – Bank reconciliation statement – rectification of errors – Suspense account	<b>15</b>	<b>CO 2</b>
<b>III</b>	Preparation of Final Accounts – Adjustments – Closing stock, outstanding, prepaid and accrued, depreciation, bad and doubtful debts, provision and discount on debtors and creditors, interest on drawings and capital.	<b>15</b>	<b>CO 3</b>
<b>IV</b>	Hire Purchase System – Default and Repossession – Hire Purchase Trading Account – Installment System.	<b>15</b>	<b>CO 4</b>
<b>V</b>	Single Entry – Meaning, Features, Defects, Differences between Single Entry and Double Entry System – Statement of Affairs Method – Conversion Method	<b>15</b>	<b>CO 5</b>
<b>Total Hours</b>		<b>75</b>	

<b>Course Outcomes</b>		
<b>Course Outcomes</b>	On completion of this course, students will;	<b>Program Outcomes</b>
<b>CO1</b>	Prepare Journal, ledger, trial balance and cash book	PO2, PO1
<b>CO2</b>	Classify errors and making rectification entries	PO1
<b>CO3</b>	Prepare final accounts with adjustments	PO2, PO6
<b>CO4</b>	To understand Hire Purchase system	PO2, PO6
<b>CO5</b>	Prepare single and double entry system of accounting.	PO6

<b>Text Books</b>	
1	Goel.D.K and Shelly Goel, 2018, Financial Accounting, Arya Publications, 2nd edition.
2	Jain .S.P &Narang .K, 1999, Financial Accounting, Kalyani Publishers, Ludhiana, 4th edition
3	Rakesh Shankar. R &Manikandan.S, Financial Accounting, SCITECH, 3rd edition.
4	Shukla&Grewal, 2002, Advanced Accounting, Sultan Chand &Sons,New Delhi, 15th edition.
5	Tulsian P.C., 2006, Financial Accounting, Pearson Education
<b>References Books</b>	
1	Dr.K.Ganesan & S.Ushena Begam – Accounting for Managers - Volume 1, Charulatha Publications, Chennai
2	TS Reddy & amp; A.Murthy; Financial Accounting -Margham Publications , 6th Edition, 2019
3	David Kolitz; Financial Accounting – Taylor and Francis group, USA 2017
4	M N Arora; Accounting for Management- Himalaya Publications House 2019.
5	SN Maheswari; Financial Accounting - Vikas Publishing House, Jan 2018.
<b>Web Resources</b>	
1	<a href="https://ebooks.lpude.in/management/mba/term_1/DMGT403_ACCOUNTING_FOR MANAGERS.pdf">https://ebooks.lpude.in/management/mba/term_1/DMGT403_ACCOUNTING_FOR MANAGERS.pdf</a>
2	<a href="https://www.drnishikantjha.com/booksCollection/Accounting%20for%20Management%20for%20MBA%20.pdf">https://www.drnishikantjha.com/booksCollection/Accounting%20for%20Management%20for%20MBA%20.pdf</a>
3	<a href="https://www.accountingtools.com/articles/2017/5/15/basic-accounting-principles">https://www.accountingtools.com/articles/2017/5/15/basic-accounting-principles</a>
4	<a href="https://en.wikipedia.org/wiki/Single-entry_bookkeeping_system">https://en.wikipedia.org/wiki/Single-entry_bookkeeping_system\</a>
5	<a href="https://www.profitbooks.net/what-is-depreciation">https://www.profitbooks.net/what-is-depreciation</a>

**Mapping with program outcomes**

	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PO 6</b>	<b>PO 7</b>	<b>PO 8</b>
<b>CO 1</b>	M	M	M	M	M	S	L	M
<b>CO 2</b>	S	M	M	M	M	S	L	S
<b>CO 3</b>	S	M	M	M	M	S	L	S
<b>CO 4</b>	S	M	M	M	M	S	L	M
<b>CO 5</b>	S	M	M	M	M	S	L	M

**S-Strong      M-Medium      L-Low**

**CO-PO Mapping with program specific outcomes (Course Articulation Matrix)**

**Level of Correlation between PSO's and CO's**

<b>CO /PO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	3	3	3	3	3
<b>CO2</b>	3	3	3	3	3
<b>CO3</b>	3	3	3	3	3
<b>CO4</b>	3	3	3	3	3
<b>CO5</b>	3	3	3	3	3
<b>Weightage</b>	15	15	15	15	15
<b>Weighted percentage of Course Contribution to Pos</b>	3.0	3.0	3.0	3.0	3.0

<b>Year : I</b>	<b>BASICS OF EVENT MANAGEMENT</b>	<b>Hours / Week : 2</b>
<b>Semester : I</b>		<b>Credit : 2</b>
<b>SEC : 1</b>		<b>Code : NBB101</b>
<b>CIA - 25 Marks</b>		<b>External - 75 Marks</b>

<b>Course Learning Objectives</b>	
<b>CO 1</b>	To know the basic of event management its concepts
<b>CO 2</b>	To make an event design
<b>CO 3</b>	To make feasibility analysis for event.
<b>CO 4</b>	To understand the 5 Ps of Event Marketing
<b>CO 5</b>	To know the financial aspects of event management and its promotion

<b>Unit</b>	<b>Course Contents</b>	<b>Number of hours</b>	<b>Learning Objectives</b>
<b>I</b>	Introduction: Event Management – Definition, Need, Importance, Activities.	6	<b>CO 1</b>
<b>II</b>	Concept and Design of Events: Event Co-ordination, Developing &, Evaluating event concept – Event Design	6	<b>CO 2</b>
<b>III</b>	Event Feasibility: Resources – Feasibility, SWOT Analysis	6	<b>CO 3</b>
<b>IV</b>	Event Planning & Promotion – Marketing & Promotion – 5Ps of Event Marketing – Product, Price, Place, Promotion, Public Relations	6	<b>CO 4</b>
<b>V</b>	Event Budget – Financial Analysis – Event Cost – Event Sponsorship	6	<b>CO 5</b>
<b>Total Hours</b>		30	

<b>Course Outcomes</b>		
<b>Course Outcomes</b>	On completion of this course, students will;	<b>Program Outcomes</b>
<b>CO1</b>	Understand basics of event management	PO1, PO6
<b>CO2</b>	Design events	PO5, PO6
<b>CO3</b>	Study feasibility of organising an event	PO2, PO6
<b>CO4</b>	Gain Familiarity with marketing & promotion of event	PO6
<b>CO5</b>	Develop event budget	PO6, PO8

<b>Text Books</b>	
1	Event Management: A Booming Industry and an Eventful Career by Devesh Kishore, Ganga Sagar Singh - Har-Anand Publications Pvt. Ltd.
2	Event Management by Swarup K. Goyal - Adhyayan Publisher - 2009
3	Event Management & Public Relations by Savita Mohan - Enkay Publishing House
4	Event Planning - The ultimate guide - Public Relations by S.J. Sebellin Ross
5	Event Management By Lynn Van Der Wagen & Brenda R Carlos, Pearson Publishers

<b>References Books</b>	
1	Event Management By Chaudhary, Krishna, Bio-Green Publishers
2	Successful Event Management By Anton Shone & Bryn Parry
3	Event management, an integrated & practical approach By Razaq Raj, Paul Walters & Tahir Rashid
4	Event Planning Ethics and Etiquette: A Principled Approach to the Business of Special Event Management by Judy Allen, Wiley Publishers
5	Event Planning: Management & Marketing For Successful Events: Management & Marketing for Successful Events: Become an Event Planning Pro & Create a Successful Event Series by Alex Genadinik CreateSpace Independent Publishing Platform, 2015
<b>Web Resources</b>	
1	<a href="https://ebooks.lpude.in/management/bba/term_5/DMGT304_EVENT_MANAGEMENT.pdf">https://ebooks.lpude.in/management/bba/term_5/DMGT304_EVENT_MANAGEMENT.pdf</a>
2	<a href="https://www.inderscience.com/jhome.php?jcode=ijhem">https://www.inderscience.com/jhome.php?jcode=ijhem</a> International Journal of Hospitality & Event Management
3	<a href="https://www.emeraldgrouppublishing.com/journal/ijefm">https://www.emeraldgrouppublishing.com/journal/ijefm</a> International Journal of Event and Festival Management
4	<a href="https://www.eventbrite.com/blog/?s=roundup">https://www.eventbrite.com/blog/?s=roundup</a>
5	<a href="https://www.eventindustrynews.com/">https://www.eventindustrynews.com/</a>

### Mapping with program outcomes

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO 1	M	S	S	S	M	S	S	S
CO 2	M	S	S	S	M	S	S	S
CO 3	S	M	S	S	S	S	S	M
CO 4	S	M	S	S	S	S	S	S
CO 5	M	S	S	S	M	S	S	S

S-Strong    M-Medium    L-Low  
CO-PO Mapping (Course Articulation Matrix)

Level of Correlation between PSO's and CO's

CO /PO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage of Course Contribution to Pos	3.0	3.0	3.0	3.0	3.0

<b>Year : I</b>	<b>MANAGERIAL COMMUNICATION</b>	<b>Hours / Week : 2</b>
<b>Semester : I</b>		<b>Credit : 2</b>
<b>FC : 1</b>		<b>Code : FBB101</b>
<b>CIA - 25 Marks</b>		<b>External - 75 Marks</b>

<b>Course Learning Objectives</b>	
<b>CO 1</b>	To educate students role & importance of communication skills
<b>CO 2</b>	To build their listening, reading, writing & speaking communication skills.
<b>CO 3</b>	To introduce the modern communication for managers.
<b>CO 4</b>	To understand the skills required for facing interview
<b>CO 5</b>	To facilitate the students to understand the concept of Communication.

<b>Unit</b>	<b>Course Contents</b>	<b>Number of hours</b>	<b>Learning Objectives</b>
<b>I</b>	Definition – Methods – Types – Principles of effective Communication – Barriers to Communication – Communication etiquette.	<b>6</b>	<b>CO 1</b>
<b>II</b>	Business Letter – Layout- Kinds of Business Letters: application, offer, acceptance/ acknowledgement and promotion letters. Business Development Letters – Enquiry, replies, Order, Sales, circulars, Grievances.	<b>6</b>	<b>CO 2</b>
<b>III</b>	Interviews- Direct, telephonic & Virtual interviews- Group discussion – Presentation skills – body language	<b>6</b>	<b>CO 3</b>
<b>IV</b>	Communication through Reports – Agenda- Minutes of Meeting - Resume Writing	<b>6</b>	<b>CO 4</b>
<b>V</b>	Modern Forms of Communication: podcasts, Email, virtual meetings – Websites and their use in Business – social media- Professional Networking sites	<b>6</b>	<b>CO 5</b>
<b>Total Hours</b>		<b>30</b>	

<b>Course Outcomes</b>		
<b>Course Outcomes</b>	<b>On completion of this course, students will;</b>	<b>Program Outcomes</b>
<b>CO1</b>	Understand communication process and its barriers.	PO1, PO2, PO3, PO4, PO8
<b>CO2</b>	Develop business letters in different scenarios	PO1, PO2, PO3, PO4, PO5, PO6
<b>CO3</b>	Develop oral communication skills & conducting interviews	PO2, PO3, PO4, PO5, PO6, PO7
<b>CO4</b>	Use managerial writing for business communication	PO1, PO2, PO4, PO5, PO6, PO8
<b>CO5</b>	Identify usage of modern communication tools & its significance for managers	PO3, PO4, PO5, PO6, PO7, PO8

<b>Text Books</b>	
1	Krishan Mohan & Meena Banerji, Developing Communication Skills, Macmillan India Ltd, 2008
2	Mallika Nawal –Business Communication – CENGAGE
3	Bovee, Thill, Schatzman, Business Communication Today - Peason Education Private Ltd - New Delhi.
4	Michael Brown, Making Presentation Happen, Allen & Unwin, Australia, 2008
5	Sundar K.A, Business communication Vijay Nicole imprints Pvt. Ltd., Chennai.
<b>References Books</b>	
1	Rajendra Paul & J S Kovalahalli, Essentials of Business Communication, Sultan Chand & Sons, New Delhi, 2017
2	Dr. C B Gupta, Basic Business Communication, Sultan Chand & Sons, New Delhi, 2017
3	R C Sharma & Krishan Mohan, Business Correspondance and Report Writing, Mc Graw Hill, India Pvt Ltd., New Delhi, 2006
4	Kevin Galaagher, Skills Development for Business and Management Students, Oxford University Press, Delhi, 2010
5	R C Bhatia, Business Communication, Ane Books Pvt Ltd., Delhi, 2015
<b>Web Resources</b>	
1	<a href="https://www.managementstudyguide.com/business_communication.html">https://www.managementstudyguide.com/business_communication.html</a>
2	<a href="https://studiousguy.com/business-communication/">https://studiousguy.com/business-communication/</a>
3	<a href="https://www.oercommons.org/curated-collections/469">https://www.oercommons.org/curated-collections/469</a>
4	<a href="https://www.scu.edu/mobi/business-courses/starting-a-business/session-8-communication-tools/">https://www.scu.edu/mobi/business-courses/starting-a-business/session-8-communication-tools/</a>
5	<a href="https://open.umn.edu/opentextbooks/textbooks/8">https://open.umn.edu/opentextbooks/textbooks/8</a>

**Mapping with program outcomes**

	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PO 6</b>	<b>PO 7</b>	<b>PO 8</b>
<b>CO 1</b>	S	S	M	S	M	S	S	S
<b>CO 2</b>	S	S	S	S	S	S	M	M
<b>CO 3</b>	M	S	S	S	S	S	S	M
<b>CO 4</b>	S	S	M	S	S	S	M	S
<b>CO 5</b>	M	M	S	S	S	S	S	S

**S-Strong    M-Medium    L-Low**

**CO-PO Mapping with program specific outcomes (Course Articulation Matrix)**

**Level of Correlation between PSO's and CO's**

<b>CO /PO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	3	3	3	3	3
<b>CO2</b>	3	3	3	3	3
<b>CO3</b>	3	3	3	3	3
<b>CO4</b>	3	3	3	3	3
<b>CO5</b>	3	3	3	3	3
<b>Weightage</b>	15	15	15	15	15
<b>Weighted percentage of Course Contribution to Pos</b>	3.0	3.0	3.0	3.0	3.0



<b>Year : I</b>	<b>MARKETING MANAGEMENT</b>	<b>Hours / Week : 6</b>
<b>Semester : II</b>		<b>Credit : 4</b>
<b>Core Paper : 3</b>		<b>Code: BB203B</b>
<b>CIA - 25 Marks</b>		<b>External - 75 Marks</b>

<b>Course Learning Objectives</b>	
<b>CO 1</b>	To understand the marketplace.
<b>CO 2</b>	To identify the market segmentation and the Product mix
<b>CO 3</b>	To select the different pricing methods and channels of distribution.
<b>CO 4</b>	To know the communication mix and sales promotion tools
<b>CO 5</b>	To prepare according to the latest trends in market.

<b>Unit</b>	<b>Course Contents</b>	<b>Number of hours</b>	<b>Learning Objectives</b>
<b>I</b>	Fundamentals of Marketing – Role of Marketing – Relationship of Marketing With Other Functional Areas- Concept of Marketing Mix – Marketing Approaches – Various Environmental Factors Affecting the Marketing Functions.	<b>18</b>	<b>CO 1</b>
<b>II</b>	Segmentation – Need And Basis of Segmentation - Targeting – Positioning, Product – Characteristics – Benefits – Classifications – Consumer Goods – Industrial Goods. Product Mix - New Product Development Process - Product Life Cycle. Branding – Packaging.	<b>18</b>	<b>CO 2</b>
<b>III</b>	Pricing – Factors Influencing Pricing Decisions – Pricing Objectives. Market Physical Distribution: Importance – Various Kinds of Marketing Channels – Distribution Problems.	<b>18</b>	<b>CO 3</b>
<b>IV</b>	A Brief Overview of Communication Mix- Types of Media & its Characteristics- Print - Electronic - Outdoor – Internet - A tool to customer loyalty. Sales Promotion tools - IMC (Integrated marketing communication) - Definition, Process, Need & Significance - CRM – Importance.	<b>18</b>	<b>CO 4</b>
<b>V</b>	Sales Force Management: Personal Selling Process- Motivation, Compensation and Control of Sales Force– Digital Marketing: Introduction- Applications & Benefits	<b>18</b>	<b>CO 5</b>
<b>Total Hours</b>		<b>90</b>	

<b>Course Outcomes</b>		
<b>Course Outcomes</b>	On completion of this course, students will;	<b>Program Outcomes</b>
<b>CO1</b>	List and identify the core concepts of Marketing and its mix.	PO1, PO2, PO3
<b>CO2</b>	Sketch the market segmentation, nature of product, PLC	PO1, PO2, PO3, PO6, PO8
<b>CO3</b>	Analyze the appropriate pricing methods	PO1 PO2, PO3, PO4, PO8
<b>CO4</b>	Determine the importance of various media	PO1, PO2, PO6
<b>CO5</b>	Assess the sales force and applications of digital marketing	PO1, PO2, PO7

<b>Text Books</b>	
1	Philip Kotler & Gary Armstrong, Principles of Marketing: A South Asian Perspective, Pearson Education, 2018.
2	Rajan Saxena, Marketing Management, Tata Mc Graw Hill, 2017.
3	L.Natarajan, Marketing, Margham Publications, 2017.
4	J P Mahajan & Anupama Mahajan, Principles of Marketing, Vikas Publishing House, 2017.
5	K Karunakaran, Marketing Management, Himalaya Publishing House, 2017.
<b>References Books</b>	
1	C. B. Gupta & Rajan Nair Marketing Management, Sultan Chand & Son 2020
2	V.S. Ramaswamy & S. Namakumari, 2002, Principles of Marketing, first edition, S.G. Wasani / Macmillan India Ltd,
3	Cranfield, Marketing Management, Palgrave Macmillan.
4	Harsh V Verma & Ekta Duggal, Marketing, Oxford University Press, 2017.
5	Sontakki C.N, Marketing Management, Kalyani Publishers, Ludhiana. 2016
<b>Web Resources</b>	
1	<a href="http://eprints.stiperdharmawacana.ac.id/24/1/%5BPhillip_Kotler%5D_Marketing_Management_14th_Edition%28BookFi%29.pdf">http://eprints.stiperdharmawacana.ac.id/24/1/%5BPhillip_Kotler%5D_Marketing_Management_14th_Edition%28BookFi%29.pdf</a>
2	<a href="https://mrcet.com/downloads/MBA/digitalnotes/Marketing%20Management.pdf">https://mrcet.com/downloads/MBA/digitalnotes/Marketing%20Management.pdf</a>
3	<a href="https://www.enotesmba.com/2013/01/marketing-management-notes.html">https://www.enotesmba.com/2013/01/marketing-management-notes.html</a>
4	Industrial Marketing Management   Journal   ScienceDirect.com by Elsevier
5	Journal of Marketing Management   Taylor & Francis Online (tandfonline.com)

**Mapping with program outcomes**

	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PO 6</b>	<b>PO 7</b>	<b>PO 8</b>
<b>CO 1</b>	S	S	M	M	M	S	M	M
<b>CO 2</b>	S	S	M	S	M	S	M	S
<b>CO 3</b>	S	S	M	M	M	S	M	S
<b>CO 4</b>	S	S	M	M	M	S	M	M
<b>CO 5</b>	S	S	M	M	M	S	M	S

**S-Strong      M-Medium      L-Low**

**CO-PO Mapping with Programme Specific Outcomes (Course Articulation Matrix):  
Level of Correlation between PSO's and CO's**

<b>CO /PO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	3	3	3	3	3
<b>CO2</b>	3	3	3	3	3
<b>CO3</b>	2	3	3	3	3
<b>CO4</b>	3	3	3	3	3
<b>CO5</b>	3	3	3	2	3
<b>Weightage</b>	14	15	15	14	15
<b>Weighted percentage of Course Contribution to Pos</b>	2.8	3.0	3.0	2.8	3.0

<b>Year : I</b>	<b>FINANCIAL MANAGEMENT</b>	<b>Hours / Week : 6</b>
<b>Semester : II</b>		<b>Credit : 3</b>
<b>Core Paper : 4</b>		<b>Code : BB204B</b>
<b>CIA - 25 Marks</b>		<b>External - 75 Marks</b>

<b>Course Learning Objectives</b>	
<b>CO 1</b>	To understand the basics of finance and roles of finance manager
<b>CO 2</b>	To evaluate capital structure & Cost of capital
<b>CO 3</b>	To evaluate capital budgeting
<b>CO 4</b>	To assess dividends
<b>CO 5</b>	To appraise working Capital

<b>Unit</b>	<b>Course Contents</b>	<b>Number of hours</b>	<b>Learning Objectives</b>
<b>I</b>	Meaning, objectives and Importance of Finance – Sources of finance – Functions of financial management – Role of financial manager in Financial Management.	<b>18</b>	<b>CO 1</b>
<b>II</b>	Capital structures planning - Factors affecting capital structures – Determining Debt and Equity proportion – Theories of capital structures – Leverage concept. Cost of capital – Cost of equity – Cost of preference share capital – Cost of debt – Cost of retained earnings – Weighted Average (or) Composite cost of capital (WACC)	<b>18</b>	<b>CO 2</b>
<b>III</b>	Capital Budgeting: ARR, Payback period, Net present value, IRR, Capital rationing, simple problems on capital budgeting methods.	<b>18</b>	<b>CO 3</b>
<b>IV</b>	Dividend policies – Factors affecting dividend payment - Company Law provision on dividend payment – Various Dividend Models (Walter’s Gordon’s–M.M. Hypothesis)	<b>18</b>	<b>CO 4</b>
<b>V</b>	Working capital – Components of working capital – operating cycle – Factors influencing working capital – Determining (or) Forecasting of working capital requirements.	<b>18</b>	<b>CO 5</b>
<b>Total Hours</b>		<b>90</b>	

<b>Course Outcomes</b>		
<b>Course Outcomes</b>	On completion of this course, students will;	<b>Program Outcomes</b>
<b>CO1</b>	Understand the basics of finance and roles of finance manager	PO1, PO5,PO6
<b>CO2</b>	Evaluate Capital structure & Cost of capital	PO1,PO2,PO6
<b>CO3</b>	Evaluate Capital budgeting	PO1, PO6
<b>CO4</b>	Assessing dividends	PO1, PO6
<b>CO5</b>	Appraise Working Capital	PO1, PO6

<b>Text Books</b>	
1	DrKulkarni and Dr. SathyaPrasad, Financial Management, 13 <sup>th</sup> Edition 2011
2	Advanced Financial Management kohok, M A, Everest Publishing House
3	Financial Management Kishore R M, Taxman Allied Service
4	Strategic Financial Management Jakhotiya
5	Financial Management & Policy Srivastava, R M Himalaya
<b>References Books</b>	
1	Dr. K. Ganesan & S.Ushena Begam, Financial Management, Charulatha Publications , Chennai
2	Financial Management - I.M.Pandey, 2009 Vikas Publishing
3	Financial Management – PrasannaChandra , 2008, Tata McGraw Hill, New Delhi
4	Financial Management – S.N.Maheswari
5	Financial Management – Y. Khan and Jain 2009 Edition, Sultan Chand & Sons
<b>Web Resources</b>	
1	<a href="https://mycbseguide.com/blog/financial-management-class-12-notes-business-studies/">https://mycbseguide.com/blog/financial-management-class-12-notes-business-studies/</a>
2	<a href="https://images.topperlearning.com/topper/revisionnotes/8006_Topper_21_101_504_553_10201_Financial_Management_up201904181129_1555567170_5654.pdf">https://images.topperlearning.com/topper/revisionnotes/8006_Topper_21_101_504_553_10201_Financial_Management_up201904181129_1555567170_5654.pdf</a>
3	Journal of Financial Management (esciencepress.net)
4	Financial Management on JSTOR
5	Financial Management Wiley online library

**Mapping with program outcomes**

	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PO 6</b>	<b>PO 7</b>	<b>PO 8</b>
<b>CO 1</b>	S	M	M	M	M	S	L	M
<b>CO 2</b>	S	S	M	M	M	S	L	S
<b>CO 3</b>	S	S	M	M	M	S	L	S
<b>CO 4</b>	S	S	M	M	M	S	L	M
<b>CO 5</b>	S	S	M	M	M	S	L	M

**S-Strong      M-Medium      L-Low**

**CO-PO Mapping (Course Articulation Matrix)**

**Level of Correlation between PSO's and CO's**

<b>CO /PO</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	3	3	3	3	3
<b>CO2</b>	3	3	3	3	3
<b>CO3</b>	3	3	2	3	3
<b>CO4</b>	3	3	3	3	3
<b>CO5</b>	3	3	3	3	3
<b>Weightage</b>	15	15	14	15	15
<b>Weighted percentage of Course Contribution to Pos</b>	3.0	3.0	2.8	3.0	3.0

Year : II	<b>FUNDAMENTAL OF TALLY</b>	Hours / Week : 2
Semester : III		Credit : 2
SDC : 2		Code : FBB301
		Total - 100 Marks

<b>Course Learning Objectives</b>	
<b>CO 1</b>	To impart knowledge about basic use of Tally and its functions
<b>CO 2</b>	To understand the creation of groups and Ledgers
<b>CO 3</b>	To provide understanding about Data Management in Tally
<b>CO 4</b>	To understand the process of GST, EPF etc.
<b>CO 5</b>	To familiarize students about significance of Tally in implications in the Organizations

Semester	Course Code	Course Title													Hours	Credit
		<b>Fundamental of Tally</b>													2	2
Course Outcomes (COS)	Programme Outcomes (PO's)					Programme Specific Outcomes (PSO's)									Mean Score Of CO'S	
	P O 1	P O 2	P O 3	P O 4	P O 5	PS O 1	P S O 2	P S O 3	PS O 4	P S O 5	PS O 6	PS O 7	PS O 8			
CO1	5	4	5	4	5	4	5	4	5	4	5	4	3	4.38		
CO2	4	4	4	5	4	5	4	3	3	2	4	5	5	4.08		
CO3	5	5	3	4	5	5	3	5	2	5	4	5	3	4.15		
CO4	3	4	3	4	5	4	4	3	4	4	5	5	5	4.08		
CO5	3	3	4	5	5	4	4	5	5	4	5	4	5	4.31		
<b>Mean Overall Scores</b>													<b>4.20</b>			

**Result: The Score of this Course is 4.20 (Very High)**

Association Scale	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	$0 \leq \text{rating} \leq 1$	$1.1 \leq \text{rating} \leq 2$	$2.1 \leq \text{rating} \leq 3$	$3.1 \leq \text{rating} \leq 4$	$4.1 \leq \text{rating} \leq 5$
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **VERY HIGH** association with Programme Outcomes and Programme Specific Outcomes.

Unit	Course Contents	Number of hours	Learning Objectives
I	Basic of Accounting & Fundamentals of Tally. ERP 9: Accounting Principles or Concepts, Rules for Accounting, Creation/ Setting up of Company in Tally ERP 9 and Configuration.	6	CO 1
II	Accounting Master in Tally. ERP 9: Groups & Ledgers Creation Inventory Master in Tally. ERP 9: Creation of Stock Groups and Categories and Units of Measure.	6	CO 2
III	Vouchers Entries & Advance Accounting in Tally. ERP 9: Types of Vouchers, Invoicing, Bill Wise Details, Cost Centers and Bank Reconciliation and Scenarios Management.	6	CO 3
IV	Advance Inventory & Taxes in Tally. ERP 9: Order processing, Batch Wise Details, POS, TDS, TDS Returns Filing, TCS, GST Returns, EPF, ESIC & Professional Tax.	6	CO 4
V	Technological Advantages, Payroll, Report Generations, Short Keys in Tally. ERP 9	6	CO 5
<b>Total Hours</b>		<b>30</b>	

Course Outcomes		
Course Outcomes	On completion of this course, students will;	Program Outcomes
CO1	Understand about the basic accounting and Tally. ERP 9	
CO2	Identify the maintained of Ledger and inventory system	
CO3	Creation of various vouchers and bill wise details	
CO4	Understand various taxes returns and filing	
CO5	Relate and infer various reports generated in Tally. ERP 9	

Text Books	
1	Journal of Emerging Technologies and Innovative Research
2	Global Journal for Research Analysis
3	Tally.ERP 9 with GST in Simple Steps by DT Editorial Services, Dreamtech Press
4	Vikas Gupta, Comdex Tally, ERP 9 Course Kit with GST and MS Excel, Wiley India, 2017
5	Official Guide To Financial Accounting Using Tally.Erp 9 With Gst by Tally Education, BPB Publications



<b>References Books</b>	
1	Shraddha Singh & Navneet Mehra, Tally. ERP 9, V & S Publishers, 2015
2	Official Guide to Financial Accounting using Tally. ERP 9, Fourth Revised & Updated Edition, BPB Publications
3	Vinod Kumar, Tally. ERP 9 Made Easy, Accounting Education
4	Bimlendu Shekhar, Tally Practical Work Book -1, 2 <sup>nd</sup> Edition
5	Asian's Quintessential Course Tally.ERP 9 with GST by Vishnu Priya Singh edition 2020
<b>Web Resources</b>	
1	<a href="https://tallysolutions.com/learning-hub/">https://tallysolutions.com/learning-hub/</a>
2	<a href="https://www.tutorialkart.com/tally/tally-tutorial/">https://www.tutorialkart.com/tally/tally-tutorial/</a>
3	<a href="https://sscstudy.com/tally-erp-9-book-pdf-free-download/">https://sscstudy.com/tally-erp-9-book-pdf-free-download/</a>
4	<a href="https://tallysolutions.com/tally/how-to-use-gst-in-tally-erp-9/">https://tallysolutions.com/tally/how-to-use-gst-in-tally-erp-9/</a>
5	<a href="https://www.javatpoint.com/tally">https://www.javatpoint.com/tally</a>

YEAR - II	ENTREPRENEURIAL DEVELOPMENT	CODE – BB401C
SEMESTER – IV		HOURS / WEEK – 6
CORE THEORY - 7		CREDIT – 5

### Objectives:

To develop and strengthen entrepreneurial quality and motivation in students.

To impart basic entrepreneurial skills and understandings to run a small business efficiently.

### Course Outcomes (CO's): After completing this course, the student will be able to:

CO1: Understand the basic concepts and theories of entrepreneurship.

CO2: Exemplify knowledge on course contents, curriculum and constraints of EDP.

CO3: Conceive business ideas and convert them into business projects.

CO4: Become familiar with institutions support various forms of assistances and subsidies.

CO5: Learn the MSMEs schemes provided to budding entrepreneurs.

Semester	Course Code	Course Title	Hours	Credit										
IV	BB401C	Entrepreneurial Development	6	5										
Course Outcomes (COS)	Programme Outcomes (PO's)					Programme Specific Outcomes (PSO's)								Mean Score Of CO'S
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	
CO1	5	4	5	4	5	4	5	4	5	4	5	4	3	4.38
CO2	4	4	4	5	4	5	4	3	3	2	4	5	5	4.08
CO3	5	5	3	4	5	5	3	5	2	5	4	5	3	4.15
CO4	3	4	3	4	5	4	4	3	4	4	5	5	5	4.08
CO5	3	3	4	5	5	4	4	5	5	4	5	4	5	4.31
Mean Overall Scores													4.20	

**Result: The Score of this Course is 4.20 (Very High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **VERY HIGH** association with Programme Outcomes and Programme Specific Outcomes.

**Unit -I Introduction to Entrepreneurship (20 Hrs.)**

Entrepreneurship: Meaning- Nature-Importance-Theories- Entrepreneur: Meaning-Definition- Characteristics-Qualities- Classification of Entrepreneurs - Roles of an Entrepreneur- Entrepreneur vs Intrapreneur - Women Entrepreneur: Concept and Definition - Problems of Women Entrepreneurs - Factors Promoting an Entrepreneur - Factors affecting Entrepreneurial Growth in India - Role of entrepreneurs in India's Economic Development

**Unit -II Entrepreneurship Development Programmes (15 Hrs.)**

EDP- Meaning-Needs-Objectives –Course Contents and Curriculum-Phases of EDP-Problems and Constraints of EDP- Organizations providing Entrepreneurship Development Programmes– Entrepreneurial Ecosystem.

**Unit -III New Venture (20 Hrs.)**

Meaning – Promoting New Venture –Sources of Business Ideas - Idea Generation Techniques- Sources of Product for Business - Prefeasibility Study - Criteria for Selection of Product - Procedures to Start a New Venture- Start-up – Need for Start-up- Business Plan for Starts up – Contents and Evaluation Criteria – Unicorn - Decacorn.

**Unit –IV Resource Mobilization Institutional Support and Subsidies (20 Hrs.)**

Resource Mobilization- Financial resources - Human resources – Material - Physical resources - Sources of Raising Funds for an Entrepreneur (traditional and modern sources)- Angel Investors- Venture Capital - Various Institutions supporting Entrepreneurial growth - Incentives and Subsidies: Meaning-Needs-Incentives and Subsidies available to Entrepreneurs– DIC- Industrial Estates – Business Incubators.

**Unit - V Managing MSME (15 Hrs.)**

Introduction- Classification of Enterprises- Memorandum of MSMEs-Registration of MSMEs- MUDRA Scheme, Prime Minister's Employment Generation Programme (PMEGP), STAND-UP INDIA and START-UP INDIA, Sickness in small Business - Preventing Sickness and Rehabilitation of Business Units.

**Text Books**

1. Dr.S.S Khanka, Entrepreneurial Development, Sultan Chand company Ltd.
2. AbhaJaiswal Micro, Small & Medium Enterprises Development Act, (Law, Policies & Incentives), Bharat Law House Pvt. Ltd

**Reference Books**

1. Vasant Desai, Small-Scale Industries and Entrepreneurship, Himalaya Publishing House, 2017
2. Prasanna Chandra- Project Preparation, Appraisal, Implementation, Tata Mc-Graw Hill, New Delhi.
3. G.N.Pande- A Complete Guide To Successful Entrepreneurship- Vikas Publishing House, New Delhi

Year : III	<b>LOGISTICS AND SUPPLY CHAIN MANAGEMENT</b>	Hours / Week : 6
Semester : V		Credit : 5
Core Paper : 9		Code :
CIA - 25 Marks		External - 75 Marks

<b>Course Learning Objectives</b>	
<b>CO 1</b>	Understand the various basic concepts and terms relating to Logistics
<b>CO 2</b>	Comprehend the importance of customer service and outsourcing relevant to logistics
<b>CO 3</b>	Evaluate the importance and issues in global logistics
<b>CO 4</b>	Possess an overall knowledge about the services and factors allied to logistics
<b>CO 5</b>	Understand the technological impact of logistics

Semester	Course Code	Course Title	Hours	Credit										
V		<b>Logistics and Supply Chain Management</b>	6	5										
Course Outcomes (COS)	Programme Outcomes (PO's)					Programme Specific Outcomes (PSO's)								Mean Score Of CO'S
	P O 1	P O 2	P O 3	P O 4	P O 5	PS O 1	P S O 2	P S O 3	PS O 4	P S O 5	PS O 6	PS O 7	PS O 8	
CO1	5	4	5	4	5	4	5	4	5	4	5	4	3	4.38
CO2	4	4	4	5	4	5	4	3	3	2	4	5	5	4.08
CO3	5	5	3	4	5	5	3	5	2	5	4	5	3	4.15
CO4	3	4	3	4	5	4	4	3	4	4	5	5	5	4.08
CO5	3	3	4	5	5	4	4	5	5	4	5	4	5	4.31
<b>Mean Overall Scores</b>													<b>4.20</b>	

**Result: The Score of this Course is 4.20 (Very High)**

Association Scale	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **VERY HIGH** association with Programme Outcomes and Programme Specific Outcomes.

<b>Unit</b>	<b>Course Contents</b>	<b>Number of hours</b>	<b>Learning Objectives</b>
<b>I</b>	Introduction to Logistics: History of Logistics-Supply chain management and logistics- Need, principles, benefits, types of logistics - cost saving & Productivity improvement. Basic concepts of national logistics policy	<b>15</b>	<b>CO 1</b>
<b>II</b>	Customer Service and outsourcing: Definition of Customer Service - Elements of Customer Service Phases in Customer Service. Customer Retention. Procurement and Outsourcing Definition of Procurement /Outsourcing Benefits of Logistics Outsourcing. Critical Issues in Logistics Outsourcing	<b>15</b>	<b>CO 2</b>
<b>III</b>	Global Logistics and Supply Chain: Organizing for Global Logistics - Strategic Issues in Global Logistics - Forces driving Globalization Modes of Transportation in Global Logistics - Barriers to Global Logistics - Financial Issues in Logistics Performance Need for Integrated logistics-Role of 3PL & 4PL. Brief overview of EXIM	<b>15</b>	<b>CO 3</b>
<b>IV</b>	Key Logistics Activities: Warehousing: Meaning, Types, Benefits. Transportation: Meaning, Types of Transportations, efficient transportation system and its benefits. Courier / Express logistics Meaning, Categorization of consignments, Courier Guidelines, Pricing in Courier - Express service for international and domestic shipping.	<b>15</b>	<b>CO 4</b>
<b>V</b>	Technology & Logistics: Informatics, using logistics system to support time - based competition - Bar coding, GPS, Point of sale data - Artificial Intelligence. Electronic data interchange-types-benefits	<b>15</b>	<b>CO 5</b>
<b>Total Hours</b>		<b>75</b>	

<b>Course Outcomes</b>		
<b>Course Outcomes</b>	<b>On completion of this course, students will;</b>	<b>Program Outcomes</b>
<b>CO1</b>	Explain the basic concepts relating to logistics	PO4
<b>CO2</b>	Analyse the role of outsourcing and customer service in logistics	PO1, PO6, PO8
<b>CO3</b>	Appraise the needs, modes and issues relating to global logistics	PO1, PO2, PO4, PO6, PO8
<b>CO4</b>	Describe about the different activities allied to logistics	PO4, PO6
<b>CO5</b>	Identify the various areas of logistics where technology can be applied	PO7, PO6

<b>Text Books</b>	
1	Vinod V. Sople (2009) Logistic Management (2nd Edn.) Pearson Limited
2	Logistics Management for International Business: Text and Cases, Sudalaimuthu & Anthony Raj, PHI Learning, First Edition, 2009
3	Logistics and Supply Chain Management, Martin Christopher, Pearson Education Limited 2012
4	Satish C. Ailawadi, Rakesh P. Singh, Logistics & Supply Chain Management, HI Learning Private Limited, 2011
5	Paul Myerson, Lean Supply Chain and Logistics Management, Mc Graw Hill, 2012
<b>References Books</b>	
1	Janat Shah, Supply Chain Management – Text and Cases, Pearson Education, 5 th edition, 2012.
2	Sunil Chopra and Peter Meindl, Supply Chain Management-Strategy Planning and Operation, PHI Learning / Pearson Education, 5th edition, 2012.
3	Fundamentals of Logistics Management (The Irwin / Mcgraw-Hill Series in Marketing), Douglas Lambert, James R Stock, Lisa M. Ellram, McGraw-hill/Irwin, First Edition, 1998
4	Fundamentals of Logistics Management, David Grant, Douglas M. Lambert, James R. Stock, Lisa M. Ellram, McGraw Hill Higher Education, 1997.
5	Logistics Management, Ismail Reji, Excel Book, First Edition, 2008.
<b>Web Resources</b>	
1	<a href="https://www.techtarget.com/searcherp/definition/logistics-management">https://www.techtarget.com/searcherp/definition/logistics-management</a>
2	<a href="https://logistikknowhow.com/en/sorter-packing-department/the-packaging-logistics/">https://logistikknowhow.com/en/sorter-packing-department/the-packaging-logistics/</a>
3	<a href="https://www.track-pod.com/blog/functions-of-logistics/">https://www.track-pod.com/blog/functions-of-logistics/</a>
4	<a href="https://www.projectmanager.com/blog/logistics-management-101">https://www.projectmanager.com/blog/logistics-management-101</a>
5	<a href="https://angelikafinntelm.files.wordpress.com/2017/05/fundamentals-of-logistics-management-by-david-grant-douglas-m-lambert-james-r-stock-lisa-m-ellram.pdf">https://angelikafinntelm.files.wordpress.com/2017/05/fundamentals-of-logistics-management-by-david-grant-douglas-m-lambert-james-r-stock-lisa-m-ellram.pdf</a>

YEAR - III	HUMAN RESOURCE MANAGEMENT	CODE- BB601B
SEMESTER -VI		HRS/WK – 6
CORE THEORY - 12		CREDIT - 4

**Objective:** To understand and familiarize the concepts of Human Resource Management.

**Course Outcomes (CO's):**

**CO1:** To understand fundamentals about human resource management, qualities of a HR manager

problems and challenges faced by a HR manager.

**CO2:** To understand the human resource planning process, analysis of job and various methods of job analysis.

**CO3:** Will know the methods of recruitment and selection process.

**CO4:** Will have the knowledge about the need for training, training and evaluation methods.

**CO5:** Will have the knowledge about performance and potential appraisal, grievance handling and disciplinary procedures.

Semester	Course Code	Course Title												Hours	Credit
VI	BB601B	Human Resource Management												6	4
Course Outcomes (COS)	Programme Outcomes (PO's)					Programme Specific Outcomes (PSO's)								Mean Score Of COS	
	P O 1	P O 2	P O 3	P O 4	P O 5	PS O 1	PS O 2	PS O 3	PS O 4	PS O 5	PS O 6	PS O 7	PS O 8		
CO1	5	4	3	5	3	5	4	5	3	4	5	4	3	4.1	
CO2	5	4	5	3	5	5	3	4	5	3	5	4	5	4.3	
CO3	5	3	5	5	4	4	3	5	4	3	4	5	4	4.2	
CO4	5	5	4	5	4	4	5	5	4	3	3	3	4	4.2	
CO5	4	5	5	4	5	4	3	3	4	5	4	5	4	4.2	
Mean Overall Scores													4.2		

**Result: The Score of this Course is 4.2 (Very High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **VERY HIGH** association with Programme Outcomes and Programme Specific Outcomes

**Unit - I:** [18 Hrs]

**Human Resources Management** – definition, meaning and function of HRM -qualities and roles of HR manager - problems and challenges of a HR manager.

**Unit -II:** [18 Hrs]

**Human Resource Planning** – definition – importance - HRP process - Job analysis – nature, process, concept of job design, methods- techniques– Job description- job specification

**Unit -III:** [18 Hrs]

**Recruitment and selection** – meaning and definition, objectives - sources of recruitment, process, methods, and recruitment practice in India- interviews.

**Unit- IV:** [18 Hrs]

**Training and Development Methods-** Meaning – nature, principles, assessing the needs of training, training and development as source of competitive advantage – methods of training, evaluation of effectiveness of training programme.

**Unit- V:** [18 Hrs]

**Performance And Potential Appraisal** - meaning, purpose-process - methods, problem - managing grievances and discipline.

**Text books:**

- 1.K. A. Aswathappa, Human resource management,McGraw Hill Education; 6th edition (2010)
2. Venkata Ratnam C.S. & Srivastava B.K.: Personnel Management and Human Resources, Tata Mc-Graw Hill, (1994)

**Reference books:**

1. Personnel Management and Industrial Relations- P.C. Tripathi -Sultan Chand & sons- 19th Edition- (2006)
2. Personnel& Human Resource Management- P.SubbaRao, Himalaya Publishing House, Mumbai, 3<sup>rd</sup>Edition, (2003)
3. Human Resource management- M.S. Saiydyan, Tata McGraw Hill Publishing, New Delhi, 1st Edition.



## QUESTION PAPER PATTERN

### **For Business Administration Papers**

**Time: 3 Hours**

**Marks: 75**

1. Part - A =  $10 \times 2 = 20$  Marks – All the questions are to be answered.
2. Part – B =  $5 \times 5 = 25$  Marks – Answer five out of seven – Open choice.
3. Part – C =  $3 \times 10 = 30$  Marks – Answer three out of five – Open Choice.

**Note:** Questions should be asked from all the units with equal weightage.

### **For Computer Applications Papers**

**Time: 3 Hours**

**Marks: 75**

- 1) Part - A =  $5 \times 5 = 25$  Marks – Answer five out of eight – Open choice
- 2) Part – B =  $5 \times 10 = 50$  Marks – Answer five out of eight – Open choice

Note: Questions should be asked from all Units. Equal importance should be given to all units.

### **Computer Applications Lab**

Internal - 40 Marks

External – 60 Marks

### **For Accounting Papers**

**Time: 3 Hours**

**Marks: 75**

- 1) Part - A =  $10 \times 2 = 20$  Marks – All the Questions are to be answered.
- 2) Part – B =  $5 \times 5 = 25$  Marks – Answer five out of seven – Open choice.
- 3) Part – C =  $3 \times 10 = 30$  Marks – Answer three out of five – Open Choice.

Note: Questions should be asked from all Units. Equal importance should be given to all Units.

**Theory: 20% Problems: 80%**

<b>I M.S.W</b>	<b>SOCIAL WORK PROFESSION</b>	<b>PSW11B</b>
<b>SEMESTER – I</b>		<b>HRS/WK – 5</b>
<b>CORE – I</b>		<b>CREDIT – 5</b>

**OBJECTIVE:**

- To understand the basic concepts of Social Work and Social Work Profession.

**COURSE OUTCOMES (COs):**

After completing this course, students will:

**CO1:** Be familiar with the Social Work and related concept along with social work theories.

**CO2:** Know the history, philosophy, and fields of Social Work.

**CO3:** Understand the social work profession and relationship with other professions and its problems.

**CO4:** Discover Social Work education in India.

**CO5:** Be relevant to the skills of Social Work in the major fields of Social Work.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

<b>SEMESTER I</b>	<b>COURSE CODE: PSW11B</b>					<b>COURSE TITLE: SOCIAL WORK PROFESSION</b>					<b>HOURS:5</b>	<b>CREDITS:5</b>
<b>COURSE OUTCOMES (CO)</b>	<b>PROGRAMME OUTCOMES (PO)</b>					<b>PROGRAMME SPECIFIC OUTCOMES (PSO)</b>					<b>MEAN SCORE OF CO'S</b>	
	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PS O1</b>	<b>PS O2</b>	<b>PS O3</b>	<b>PS O4</b>	<b>PS O5</b>		
<b>CO1</b>	5	4	4	3	5	5	4	3	5	5	<b>4.3</b>	
<b>CO2</b>	5	3	5	4	5	5	5	3	5	5	<b>4.5</b>	
<b>CO3</b>	5	3	4	4	5	5	5	4	5	5	<b>4.5</b>	
<b>CO4</b>	5	4	5	4	5	5	5	4	4	5	<b>4.6</b>	
<b>CO5</b>	5	3	5	4	5	5	5	4	5	5	<b>4.6</b>	
<b>Mean Overall Score</b>											<b>4.5</b>	

**Result: The Score of this Course is 4.5 (Vey High)**

<b>Association</b>	<b>1%-20%</b>	<b>21%-40%</b>	<b>41%-60%</b>	<b>61%-80%</b>	<b>81%-100%</b>
<b>Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Interval</b>	<b>0&lt;=rating&lt;=1</b>	<b>1.1&lt;=rating&lt;=2</b>	<b>2.1&lt;=rating&lt;=3</b>	<b>3.1&lt;=rating&lt;=4</b>	<b>4.1&lt;=rating&lt;=5</b>
<b>Rating</b>	<b>Very Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>High</b>	<b>Very High</b>

This Course is having **Very High** association with Programme Outcome and Programme Specific Outcome.

## **UNIT – I**

**Fundamental concepts of Social Work** - Social Work - Definition, Objectives, Philosophy and scope Principles, Nature, Goals and Process. Concept of related terms: Social Service, Social Policy, Social Legislation, Social Transformation, Social Welfare, Social Security, Social Defense, Social Justice, Gender Equity Sustainable Development and Human Development Index and Social Development. Introduction to the Methods of Social Work.

## **UNIT – II**

**Historical Development of Social Work** - Evolution of Social Work in the across the world (UK, USA and India). Social Work in India. Religious Foundation of Social Work in India. Gandhian Thoughts of Social Work. Social Reform: Contribution of Social Reformers in 19th and 20th Century in the development of Professional Social Work in India.

## **UNIT – III**

**Philosophies and Ethics of Social work** - Social Work as a Profession: Nature and characteristics of a profession. Social Work Values – Competencies and Code of Ethics in Social Work practice. Social Work Principles. Models of Social work. Roles and Responsibilities of a Professional Social Worker. Theories for Social Work Practice: system theory, social learning theory, conflict theory, cultural lag theory.

## **UNIT – IV**

**Development of Social Work Education** - Social Work Education in India - Focus, Nature and Content of Social Work Education. Field Work in Social Work Profession: Objectives, Need and Importance- Significance of Field Work Supervision. Role of Voluntary Organizations and Government in promoting social work profession in India. National and International Professional Associations. Social Work Profession and Education in Global perspective. Problems and Prospects of Social work profession in India.

## **UNIT – V**

**Social Work Practice in Different settings** - Fields of Social Work practice: Community Settings, Family and Child Welfare – Youth Welfare – Educational Settings - Medical and Psychiatric settings – Industrial Settings - Correctional Social Work - Social Work with Marginalized and Vulnerable sections – Persons with Disability and Social Work, Geriatric Social Work, Environment, Women and Welfare, Healthcare and Disaster Management. Emerging Perspectives, Trends and Challenges of Social Work for Practice.

### **Text Books**

1. Encyclopedia of Social work in India, 1987 Vol.1,2,3. Director, publication division, ministry of information and broadcasting, New Delhi.
2. Hajira, Kumar 1995 Theories in social work practice, New Delhi: Friends Publication, India.
3. Paul Chowdary, 2018 Social Work –Introduction to Social Work - History, Concept, Methods and Fields, Atma Ram & Sons, New Delhi.
4. Sanjay Bhattacharya, 2013. Social Work Interventions and Management. New Delhi: Deep and Deep Publications.
5. Sanjay Bhattacharya, 2018. Social Work an Integrated Approach, Deep and Deep Publications Pvt., Ltd., New Delhi.

### **Books for References**

1. Bogo, Marion. 2007. Social Work Practice – Concepts, Processes & Interviewing. Jaipur: Rawat Publications.
2. Cox, David & Manohar Pawar. 2006. International Social Work – Issues, Strategies and Programs. New Delhi: Vistar Publications.
3. Desai, M. 2000, Curriculum Development on history of ideologies for social change and social work, Mumbai.
4. Desai, Murali 2002 Ideologies and Social Work: Historical and Contemporary Analysis, Jaipur: Rawat Publication.
5. Dominelli, Lena. 2004. Social Work: Theory and Practice for a Changing Profession. London: Polity Press
6. Gilbert, Neil. et. al. 2002. An Introduction to Social Work Practice. New Jersey: Prentice Hall.
7. Jha, Jainendra Kumar. 2002. Practice of Social Work. New Delhi: Anmol Publications
8. Narendra Mohan, 2017, Philosophy of Social Work, Centum Press, New Delhi
9. Sheldon, B., & Macdonald, G., 2010 A Textbook of Social Work, London: Routledge.

<b>I M.S.W</b>	<b>SOCIAL CASE WORK</b>	<b>PSW12A</b>
<b>SEMESTER – I</b>		<b>HRS/WK – 5</b>
<b>CORE– II</b>		<b>CREDIT – 5</b>

**OBJECTIVE:**

To know the basic concepts of a Social Case Work and its Practice.

**COURSE OUTCOMES (COs):**

After completing this course, students will:

**CO1:** Acquire knowledge on the foundation of case work

**CO2:** Diagnose the problems of individuals and treat them effectively

**CO3:** Gain knowledge on the models and approaches of Social Case Work and its application

**CO4:** Use various tools and techniques to help the individuals

**CO5:** Apply the Knowledge of case work in different settings

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

<b>SEMESTER I</b>	<b>COURSE CODE: PSW12A</b>					<b>COURSE TITLE: SOCIAL CASE WORK</b>					<b>HOURS:5</b>	<b>CREDIT S:5</b>
<b>COURSE OUTCOMES (CO)</b>	<b>PROGRAMME OUTCOMES (PO)</b>					<b>PROGRAMME SPECIFIC OUTCOMES (PSO)</b>					<b>MEAN SCORE OF CO'S</b>	
	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PS O1</b>	<b>PS O2</b>	<b>PS O3</b>	<b>PS O4</b>	<b>PS O5</b>		
<b>CO1</b>	5	3	5	4	5	5	5	3	4	4	<b>4.3</b>	
<b>CO2</b>	5	3	5	4	4	5	5	4	5	5	<b>4.5</b>	
<b>CO3</b>	4	3	5	4	5	5	5	4	4	4	<b>4.3</b>	
<b>CO4</b>	5	4	5	5	5	4	5	5	4	4	<b>4.6</b>	
<b>CO5</b>	5	4	5	4	5	5	5	3	5	5	<b>4.6</b>	
<b>Mean Overall Score</b>											<b>4.46</b>	

**Result: The Score of this Course is 4.46 (Very High)**

<b>Association Scale</b>	<b>1%-20%</b>	<b>21%-40%</b>	<b>41%-60%</b>	<b>61%-80%</b>	<b>81%-100%</b>
<b>Interval</b>	<b>0&lt;=rating &lt;=1</b>	<b>1.1&lt;=rating &lt;=2</b>	<b>2.1&lt;=rating &lt;=3</b>	<b>3.1&lt;=rating &lt;=4</b>	<b>4.1&lt;=rating &lt;=5</b>
<b>Rating</b>	<b>Very Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>High</b>	<b>Very High</b>

This Course is having **Very High** association with Programme Outcome and Programme Specific Outcome

**UNIT – I**

**Social Casework as a method of Social Work:** Concepts, Meaning, objectives, purpose, Historical Development of Social Case Work in West and India. Social Roles, Social Functioning, Need Assessment, Adaptation, Social environment, Person-in-Environment Fit, Principles of Case Work. Skills in social case work. Case Worker – Client relationship and the use of Professional Self, Problems in professional relationship.

## **UNIT – II**

**Tools and techniques in Case Work:** Tools and techniques in casework: observation, interview, collateral contacts, home visits, referrals, Verbal and nonverbal communication, Techniques in practice – ventilation, emotional support, advocacy, Environment modification, modelling, role-playing, confrontation, – Case history taking, Recording – Uses, principles, types, structure and content. Use of genograms, and eco-maps, family schema in records.

## **UNIT – III**

**Case Work Components and Process:** Components of Case Work, Process of Case Work: Intake; Study; Assessment / Social Diagnosis; Treatment / Intervention; Evaluation: Termination; Follow-up. Techniques of Case Work Intervention, Characteristics of Professional relationship in social case work. Principles of Interviewing.

## **UNIT – IV**

**Theoretical Approaches to Case Work / Models of case work practice:** Psychosocial model, Diagnostic Model, Functional model, Life model, Problem solving model, Task Centred and Radical Approach. Crisis intervention, Eclectic approach, Family centred approach, Behavior Modification, and eco-system perspective in social casework. Psychotherapy, Counselling and Social Case Work- similarities and differences.

## **UNIT – V**

**Social Case Work application / Practice in different settings** : Case work practice in different settings in India. Social case work practice with Family and Child Welfare, Educational settings, Industrial settings, De-addiction, Community, Medical and Psychiatric institutions. Correctional settings: geriatric care & aged and the terminally ill, persons with disability, de-addiction, Rehabilitation centres, Delinquency, LGBT and in foster home and

non-institutional services such as adoption, sponsorship. Use of single case evaluation and ethnography as research method in social case work. Limitations of Social Case Work practice in India in current scenario.

### **Text Books**

1. Upadhyay, R. K, 2003 Social Casework: A Therapeutic Approach, Rawat Publications, India.
2. Johnson E.J., Huggins C.L. (2019) Social Casework Methodology: A Skills Handbook for the Caribbean Human Services Worker. Springer Briefs in Social Work. Springer, Cham.
3. Johnson, L. C. & Yanaca S. J. (2015). Social Work Practice: A generalist approach, Pearson.
4. Hamilton, G., 2013\_Theory and Practice of Social Case Work, Rawat Publications, India.
5. Perlman, H.H., 2011, Social Case Work-A Problem Solving Process, Rawat Publications
6. Sanjay Bhattacharya, 2008, \_Social Work intervention and management‘, Deep & Deep publication (p) Ltd

### **Books for References**

1. Healy, K. 2012, Social Work Methods and Skills, Palgrave MacMillan
2. Bogo, M. (2007). Social work practice: Concepts, process & Interviewing, Rawat Publication.
3. Misra P.D., BeenaMisra, 2004, Social Work Profession in India, New Royal book Com. Lacknow
4. Mathew, Grace (1992) An Introduction to Social Casework. Bombay: Tata Institute of Social Sciences.

<b>I.M.S.W</b>	<b>SOCIAL GROUP WORK</b>	<b>PSW13A</b>
<b>SEMESTER – I</b>		<b>HRS/WK – 5</b>
<b>CORE – III</b>		<b>CREDIT – 4</b>

**OBJECTIVE:**

- To understand the basic concepts of Social Group Work and responsibility of group worker.

**COURSE OUTCOMES (COs):**

After completing this course, students will:

- CO1:** Develop theoretical understanding on Group Work as a method of Social Work
- CO2:** Be exposed to the theories, models and approaches of Social Group Work
- CO3:** Demonstrate ethical standards in working with the group
- CO4:** Practice Social Group Work as a method of Social Work in the field
- CO5:** Utilize programme media in Social Work practice

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

<b>SEMESTER I</b>	<b>COURSE CODE: PSW13A</b>					<b>COURSE TITLE: SOCIAL GROUP WORK</b>					<b>HOURS: 5</b>	<b>CREDITS: 4</b>
<b>COURSE OUTCOMES (CO)</b>	<b>PROGRAMME OUTCOMES (PO)</b>					<b>PROGRAMME SPECIFIC OUTCOMES (PSO)</b>					<b>MEAN SCORE OF CO'S</b>	
	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PS O1</b>	<b>PS O2</b>	<b>PS O3</b>	<b>PS O4</b>	<b>PS O5</b>		
<b>CO1</b>	5	4	3	5	4	4	5	3	5	5	<b>4.3</b>	
<b>CO2</b>	4	3	4	4	5	5	5	3	5	5	<b>4.3</b>	
<b>CO3</b>	5	4	5	4	5	5	5	3	5	5	<b>4.6</b>	
<b>CO4</b>	5	4	4	5	5	5	4	3	5	4	<b>4.4</b>	
<b>CO5</b>	4	4	5	5	5	5	5	4	5	5	<b>4.7</b>	
<b>Mean Overall Score</b>											<b>4.46</b>	

**Result: The Score of this Course is 4.46(Very High)**

<b>Association</b>	<b>1%-20%</b>	<b>21%-40%</b>	<b>41%-60%</b>	<b>61%-80%</b>	<b>81%-100%</b>
<b>Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Interval</b>	<b>0&lt;=rating&lt;= 1</b>	<b>1.1&lt;=rating&lt;= 2</b>	<b>2.1&lt;=rating&lt;= 3</b>	<b>3.1&lt;=rating&lt;= 4</b>	<b>4.1&lt;=rating&lt;= 5</b>
<b>Rating</b>	<b>Very Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>High</b>	<b>Very High</b>

This Course is having **Very High** association with Programme Outcome and Programme Specific Outcome



## **UNIT – I**

**Introduction to Social Group Work:** The Group: Definition, characteristics, types, functions and group structure, classification and making of groups. Social Group Work: Definitions, objective, Values and Principles of Social Group Work. Skills, Roles and Responsibility of Social Group Worker. History of Social Group Work in India and abroad. Social Group Work as a method of Social Work.

## **UNIT – II**

**Group Dynamics and Group functioning:** Dynamics of Groups: Bond, Acceptance, Isolation, Rejection, Subgroups, Conflict and Control. Group Membership, Group Norm, Group Cohesiveness, Group Culture, Group Morale, Group Attraction. Leadership and Communication in groups. Relationships- Sociometry. Issues of Identity, Diversity and Marginalization.

## **UNIT – III**

**Group formation and Group work process:** Group Formation Phases: Forming- Storming, Norming, Performing, Adjourning. Group Work Process: Phases of Social Group Work Process: Intake, Study, Analysis and Assessment, Negotiating, Contracts, Treatment, Evaluation, Termination, Stabilization of change effort. Decision making and Problem Solving Process.

## **UNIT – IV**

**Types and models of group work:** Models of Social Group Work: Remedial, Mediating or Reciprocal, Developmental, Social Goal Model and Consensus Model. Theories of Leadership, Skills, Qualities and Roles and responsibilities of group leader. Techniques and Skills in Group Work, Group therapy: Significance of Group therapy. Recording in Social Group Work: Principles, Structure and Types. Monitoring and Evaluation.

## **UNIT – V**

**Application of Social Group Work:** Application of Social Group Work in School Settings, Community Settings, Health Settings, Family Welfare Settings, Industrial Settings, Women welfare and Child care Settings, Correctional Settings, Older Persons, Oppressed Groups, Religious Minorities, Persons who are Gay & Lesbian and other Socially and Economically Disadvantaged Groups

### **Books**

1. Alissi,A.S (1980) Perspectives on social group work practice; A book of Reading, New York: The free press.
2. Dave Capuzzi, Douglas R.Gross, Mark D. Stauffer (2010) Introduction to Group Work, New Delhi, Rawat Publication.
3. David, C., Douglas, R.G. & Mark, D.S. (2010) Introduction To Group Work, New Delhi, Rawat Publication
4. Gravin, Charles. D. Lorriae& M. Gulier. (2007). A Hand Book of Social Work with Groups .New Delhi: Rawat Publications.
5. Toseland, Ronald & Rivas, Robert (2001), Introduction to Group Work Practice, Allyn and Bacon, London.

### **References**

1. Bradler,S and Roman C.P (2016) Group work Skills and strategies for effective Interventions New York: The Howorth Press.
2. Delbecq, A. L. and Van de Ven, A. H. (1977) 'A group process model for problem identification and program planning', in N. Gilbert and H. Specht (eds), Planning For Welfare, Englewood Cliffs, NJ, Prentice-Hall.
3. Gerald Corey (2000) Theory and practice of group Counselling , Wordsworth, London.
4. Siddiqy, H Y (2008), Group Work: Theories and Practices, Rawat Publications.
5. Trecker, Harleigh B (2020) Social Group Work: Principles and Practice, New Delhi, Pranava Books.

<b>I – M.S.W</b>	<b>FIELD WORK– I</b>	<b>PSWF1A</b>
<b>SEMESTER – I</b>		<b>HRS/WK : 10*</b>
<b>CORE PRACTICAL – I</b>		<b>CREDIT : 3</b>

**OBJECTIVE:**

- To know about different field of Social Work Profession through observation visits and to learn about street theatre.

**COURSE OUTCOMES (COs):**

After completing this course, students will:

- CO1:** Be exposed to different fields of Social Work
- CO2:** Understand the role of professional Social Worker in a structured agency
- CO3:** Understand and reflect on diverse needs and problems of the target groups
- CO4:** Appraise on the theoretical framework, approaches, models and practices
- CO5:** Develop positive framework about the profession

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

<b>SEMESTER I</b>	<b>COURSE CODE: PSWF1A</b>					<b>COURSE TITLE: FIELD WORK – I</b>					<b>HOURS: 10</b>	<b>CREDITS: 3</b>
<b>COURSE OUTCOMES (CO)</b>	<b>PROGRAMME OUTCOMES (PO)</b>					<b>PROGRAMME SPECIFIC OUTCOMES (PSO)</b>					<b>MEAN SCORE OF CO'S</b>	
	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PSO 1</b>	<b>PSO 2</b>	<b>PSO 3</b>	<b>PSO 4</b>	<b>PSO 5</b>		
<b>CO1</b>	5	4	5	4	5	5	5	3	4	5	<b>4.5</b>	
<b>CO2</b>	5	4	4	3	5	5	4	3	4	4	<b>4.1</b>	
<b>CO3</b>	4	4	5	4	5	5	5	3	5	5	<b>4.5</b>	
<b>CO4</b>	5	4	5	4	5	5	4	3	5	5	<b>4.5</b>	
<b>CO5</b>	5	4	5	3	5	5	4	3	4	5	<b>4.3</b>	
<b>Mean Overall Score</b>											<b>4.38</b>	

**Result: The Score of this Course is 4.38(Very High)**

<b>Association</b>	<b>1%-20%</b>	<b>21%-40%</b>	<b>41%-60%</b>	<b>61%-80%</b>	<b>81%-100%</b>
<b>Scale</b>	1	2	3	4	5
<b>Interval</b>	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
<b>Rating</b>	<b>Very Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>High</b>	<b>Very High</b>

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome

### **Field Work Components:**

The students of I MSW are required to complete the following components, document various activities and field assignments, submit the same to the department with the consent of their concerned faculty guide and approved by Head of the department to sit for viva-voce examination at the end the of the semester.

#### **Component – 1: Observational Visit**

The first-year students during the first semester go for observational visits to various social welfare agencies in Medical & Psychiatric, Rural Community Setting, Slums, Tribal Setting, Industrial Setting and Correctional Setting. They must have minimum 6 visits to different settings. The purpose of the visits is to get them acquainted with the structure, functioning and staffing pattern and activities of the organization and to document the observational learning of the visit.

#### **Component – 2: Street Theatre training**

Students are taught the art of doing street plays for sensitizing the problematic community and folk arts are also taught to enable them to undertake community organization programme. Training on theatre for self-transformation is undertaken for a period of 7 days which strengthen them to be conscious, sociable, responsive and human in understanding the existing issues in the society and to address these by relevant interventions.

#### **Component – 3: Rural Awareness Camp**

Rural Camp is an integral part of the social work curriculum and mandatory course for all first-year students. It involves organising rural camp by the first-year students under the guidance of faculty of the department for a duration of 7 days in order to enable students experience Rural Living and Group Life Process. The students have to undertake pilot visits in order to identify appropriate rural community, identify relevant projects, coordinate and work in small committees to execute tasks, network with various NGOs and government officials for programme implementation, analyse, document & evaluate the process and its outcomes and integrate the learning to build professional competence. Pre-camp planning, execution of camp,

#### **Component – 4: Project Field Work**

Project Field Work is a unique component in Field – 1 which provides an opportunity for the students for their skill development. Students can be divided into groups based on total number of students admitted in the class and can undertake field projects either in community or school or any other setting. Each group is guided by the faculty in the department to plan, implement and document the project. Street play, sensitizing the prevalent issue through chart work, oral presentation, and puppet show can be performed by the students for making people aware of the issues.

Every week the students write report of their activities and submit to the concerned faculty supervisor on Mondays. The supervisor conducts individual and group conference every week regularly. At the end of the semester Viva Voce is conducted by an external examiners and marks are awarded. The Internal Mark is 40 and the External Mark is 60.

#### **Evaluation pattern for Field Work Components:**

<b>Internal Assessment</b>	<b>Marks</b>	<b>External Assessment</b>	<b>Marks</b>
Completion of Field work requirements	10	Presentation in the viva-voce	25
Guidance & Report Writing	20	Quality of consolidated report	25
Skills Acquired	10	Professional attitude, knowledge and Skills	10
	<b>40</b>		<b>60</b>

<b>I – M.S.W</b>	<b>SOCIOLOGICAL AND PSYCHOLOGICAL FOUNDATIONS FOR SOCIAL WORK</b>	<b>EPSW14A</b>
<b>SEMESTER – I</b>		<b>HRS/WK : 5</b>
<b>ELECTIVE – I (A)</b>		<b>CREDIT : 3</b>

**OBJECTIVE:**

- To establish the linkage between psychology, sociology and Human behaviour for effective social work practice.

**COURSE OUTCOMES**

On the successful completion of the course, student will be able:

**CO1:** To get an in depth knowledge on the basic concepts of Psychology.

**CO2:** To understand the basic principles of Human growth and Development

**CO3:** To develop understanding on the basic concepts of society and social change

**CO4:** To analyse the basics of Social Interaction and Social processes and understand about Social Institutions

**CO5:** To analyse the social Institutions and critically evaluate modern trends in social institutions

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER I	COURSE CODE: EPSW14A					COURSE TITLE: PSYCHOLOGY FOR SOCIAL WORKERS					HOURS: 5	CREDITS: 3
	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)						
COURSE OUTCOMES (CO)	PO 1	PO 2	PO 3	PO 4	PO 5	PS O1	PS O2	PS O3	PS O4	PS O5		
CO1	5	3	5	3	5	5	4	3	5	5	4.3	
CO2	4	4	4	4	5	4	5	3	4	5	4.2	
CO3	4	4	4	4	5	5	5	3	4	4	4.2	
CO4	4	4	5	4	5	5	5	4	5	4	4.5	
CO5	5	3	5	4	5	5	5	3	5	4	4.4	
<b>Mean Overall Score</b>											<b>4.32</b>	

**Result: The Score of this Course is 4.32(Very High)**

<b>Association</b>	<b>1%-20%</b>	<b>21%-40%</b>	<b>41%-60%</b>	<b>61%-80%</b>	<b>81%-100%</b>
<b>Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Interval</b>	<b>0&lt;=rating&lt;=1</b>	<b>1.1&lt;=rating&lt;=2</b>	<b>2.1&lt;=rating&lt;=3</b>	<b>3.1&lt;=rating&lt;=4</b>	<b>4.1&lt;=rating&lt;=5</b>
<b>Rating</b>	<b>Very Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>High</b>	<b>Very High</b>

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome

## **UNIT – I**

**Introduction to Psychology:** Definition and branches of Psychology, Psychology for Social Work practice, Perception: Process of Perception, Social Perception. Learning: Classical Conditioning and Operant Conditioning. Memory: Sensory memory, Short-term memory, long term memory. Attitude formation and Theories of Collective Behaviour.

## **UNIT – II**

**Human Development:** Developmental Psychology - Meaning and principles of growth and development, Family, heredity, environment and ecological influences. Human Behaviour: Normal and Abnormal Behaviour Determinants. Brief outline of Human Development: Development Tasks and Hazards during Pre Natal, Infancy, Babyhood, Childhood, Puberty, Adolescence, Adulthood, Middle Age and Old Age. Theories of Personality: Psycho Analytic Theory and Humanistic theory.

## **UNIT – III**

**Sociology and related Concepts:** Meaning and definition of Sociology. Social Structure, Social Institution, Social Group, Socialization, Social Control and Social Change. Society: Meaning, definition and characteristics. Approaches to the study of Society: Functionalist, Conflict, Structuralism and Post Modernism. Culture: Definition, characteristics, functions.

## **UNIT – IV**

**Social Interaction & Social Process:** Competition, Co-operation, Conflict, Accommodation & Assimilation. Socialization: Definition, Characteristics, Types, Agencies of Socializations and Theories of Socialization. Social Stratification: Definition, Characteristics, Forms & Approaches - Marxist, Functionalist and Weberian approach.

## **UNIT – V**

**Social Institutions: Types of Social institutions:** Marriage, Family, Religion, Education, Economy. Norms, Values, Folkways & Mores. Social Movements: Origin, Nature, Types of Movements. Social Movements in India – Chipko Movement, Narmadha Bacho Andolan, Dalit Movement, Women Movement, Self-respect Movement. Problems of Sub altern.

### **Text Books**

1. Vidya, Bhushan., Sachdeva, D. (2005). Introduction to Sociology. Allahabad: Kitab Mahal.
2. Haralambos. (2014). Sociology: Themes and perspectives. Harper Collins; Eight edition
3. Hurlock, Elizabeth B. (1996). Developmental Psychology-a life span approach. Tata New Delhi: Mcgraw - Hill Publishing Co. Ltd.
4. Shankar Rao, C. N. (2007). Sociology: Principles of Sociology with an Introduction to Social Thought. New Delhi: S Chand & Co. Ltd.
5. MacIver, R.M., Page, C.H. (2000). Society an Introductory Analysis. New Delhi: Macmillan Publishers India

### **Books for References**

1. Madan, G.R. (2002). Indian Social Problems, Mumbai: Allied Publishers Pvt. Ltd
2. Morgan, C.T., King, R.A., Weisz, J.R., & Schopler, J (2004) Introduction to Psychology. New Delhi: Tata Mc Graw-Hill book Co.
3. Ram Ahuja (2014) Social Problems in India, Third Edition, Rawat Publications
4. Rawat, H. (2007). Sociology Basic Concepts. Jaipur: Rawat Publications
5. Zastrow, C. & K. (2010). Understanding Human Behavior and the Social Environment. Chicago: Nelson-Hall.
6. Elgin, F.H.& David, C. (2017), Social Science- An Introduction to the Study of Society. (13<sup>th</sup> ed.). New York: Pearson
7. Hutchison, E. (2007). Dimensions of Human Behavior: Person and Environment. Thousand Oaks: Sage Publications, Inc



I – M.S.W	SOCIETY AND HUMAN BEHAVIOUR	EPSW14B
SEMESTER – I		HRS/WK: 5
ELECTIVE – I (B)		CREDIT: 3

**OBJECTIVE:**

- To understand the realm of social issues and its Socio-economic linkages and its link with human behaviour.

**COURSE OUTCOMES**

On the successful completion of the course, student will be able:

**CO1:** To be aware of the concepts related to Sociology and Social Work

**CO2:** To understand various patterns of Social Interaction, social processes and its dimensions

**CO3:** To understand the basic concepts in Psychology and Human Behaviour

**CO4:** To Understand Social Stratification and the impact of changing Societies

**CO5:** To understand various social issues and existing agencies of social control.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER I	COURSE CODE: EPSW14B					COURSE TITLE: SOCIETY AND HUMAN BEHAVIOUR					HOURS:5	CREDITS:3
COURSE OUTCOMES (CO)	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)					MEAN SCORE OF CO'S	
	PO 1	PO 2	PO 3	PO 4	PO 5	PS O1	PS O2	PS O3	PS O4	PS O5		
CO1	5	3	5	3	5	5	4	3	5	5	4.3	
CO2	4	4	4	4	5	4	5	3	4	5	4.2	
CO3	4	4	4	4	5	5	5	3	4	4	4.2	
CO4	4	4	5	4	5	5	5	4	5	4	4.5	
CO5	5	3	5	4	5	5	5	3	5	4	4.4	
<b>Mean Overall Score</b>											<b>4.1</b>	

**Result: The Score of this Course is 4.1(Very High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome

## **UNIT – I**

**Introduction to Psychology:** Definition and branches of Psychology, Psychology for Social Work practice, Perception: Process of Perception, Social Perception. Learning: Classical Conditioning and Operant Conditioning. Memory: Sensory memory, Short-term memory, long term memory. Attitude formation and Theories of Collective Behaviour.

## **UNIT – II**

**Human Development:** Developmental Psychology - Meaning and principles of growth and development, Family, heredity, environment and ecological influences. Human Behavior: Normal and Abnormal Behaviour Determinants. Brief outline of Human Development: Development Tasks and Hazards during Pre Natal Period, Infancy, Babyhood, Childhood, Puberty, Adolescence, Adulthood, Middle Age and Old Age. Theories of Personality: Psycho Analytic Theory of Personality, Behavioural theories and Humanistic theories.

## **UNIT – III**

**Sociological Concepts:** Social Structure, Social Institutions and Social Groups, Social Control and Social Change. Society: Meaning, definition and characteristics. Approaches to the study of Society: Functionalist, Conflict, Structuralism and Post Modernism. Culture: Definition, characteristics, structure, functions.

## **UNIT – IV**

**Social Interaction & Social Process:** Competition, Co-operation, Conflict, Accommodation & Assimilation. Socialization: Definition, Characteristics, Types, Agencies of Socializations and Theories of Socialization. Social Stratification: Definition, Characteristics, forms, Approaches - Marxist, Functionalist and Max Weber.

## **UNIT – V**

**Social Institutions: Types of Social institutions:** Marriage, Family, Religion, Education, Economy. Norms, Values, Folkways & Mores. Social Movements: Origin, Nature, Types of Movements. Social movements in India: Narmadha Bacho Andolan, Dalit movement, Women movement, Dalit movement, Self-respect movement. Problems of Sub altern.

### **Text Books**

1. Elgin, F.H.& David, C.(2017),Social Science- An Introduction to the Study of Society. (13<sup>th</sup> ed.). Newyork: Pearson
2. Francis, Abraham, M. (2006). Contemporary Sociology. Oxford Oxfordshire: Oxford University Press
3. Madan, G.R. (2002) .Indian Social Problems, Mumbai : Allied Publishers Pvt. Ltd
4. Shankar Rao, C. N. (2007). Sociology: Principles of Sociology with an Introduction to Social Thought. New Delhi: S Chand & Co. Ltd.
5. MacIver, R.M., Page, C.H. (2000). Society an Introductory Analysis. New Delhi: Macmillan Publishers India.

### **Books for References**

1. Feldman, R.S. (2004). Understanding Psychology (6th Edition), New Delhi, Tata-McGraw Hill.
2. Haralambos. (2014). Sociology: Themes and perspectives. Harper Collins; Eight edition
3. Madan, G.R. (2002). Indian Social Problems, Mumbai : Allied Publishers Pvt. Ltd
4. Morgan, C.T., King, R.A., Weisz, J.R., & Schopler, J (2004) Introduction to Psychology. New Delhi: Tata Mc Graw-Hill book Co.
5. Ram Ahuja (2014). Social Problems in India ,Third Edition ,Rawat Publications
6. Hutchison, E. (2007). Dimensions of Human Behavior: Person and Environment. Thousand Oaks: Sage Publications, Inc
7. Rajendra K Sharma (2007), Social change and Social Control, New Delhi, Atlantic Publishers.
8. Shah, G. 1990. Social Movements in India: A Review of Literature. New Delhi: Sage Publications.
9. Zastrow, C. &, K. (2010). Understanding Human Behavior and the Social Environment. Chicago: Nelson-Hall.

<b>I – M.S.W</b>	<b>SOCIAL WORK RESEARCH AND SOCIAL STATISTICS</b>	<b>PSW21A</b>
<b>SEMESTER – II</b>		<b>HRS/WK : 5</b>
<b>CORE– IV</b>		<b>CREDIT : 4</b>

**OBJECTIVE:**

To understand the concept of Social Work Research and Social Statistics.

**COURSE OUTCOMES (COs):**

After completing this course, students will:

**CO1:** Develop the theoretical understanding of Social Work Research.

**CO2:** Employ suitable research design and formulate research hypothesis.

**CO3:** Adopt suitable sampling technique, tool and method of data collection.

**CO4:** Identify appropriate statistical tests for data analysis and gain insights for data interpretation.

**CO5:** Develop skills to write research proposal and prepare research report.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

<b>SEMESTER II</b>	<b>COURSE CODE: PSW21A</b>					<b>COURSE TITLE: SOCIAL WORK RESEARCH AND SOCIAL STATISTICS</b>					<b>HOURS: S:5</b>	<b>CREDITS: S:4</b>
<b>COURSE OUTCOMES (CO)</b>	<b>PROGRAMME OUTCOMES (PO)</b>					<b>PROGRAMME SPECIFIC OUTCOMES (PSO)</b>					<b>MEAN SCORE OF CO'S</b>	
	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>		
<b>CO1</b>	4	5	4	5	4	4	4	5	4	4	<b>4.3</b>	
<b>CO2</b>	3	5	4	4	4	4	4	5	3	3	<b>3.9</b>	
<b>CO3</b>	2	4	3	4	2	3	3	4	3	3	<b>3.1</b>	
<b>CO4</b>	2	4	3	3	2	3	3	4	3	3	<b>3</b>	
<b>CO5</b>	4	5	4	4	4	4	3	4	3	3	<b>3.8</b>	
<b>Mean Overall Score</b>											<b>3.62</b>	

**Result: The Score of this Course is 3.62 (High)**

<b>Association</b>	<b>1%-20%</b>	<b>21%-40%</b>	<b>41%-60%</b>	<b>61%-80%</b>	<b>81%-100%</b>
<b>Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Interval</b>	<b>0&lt;=rating&lt;=1</b>	<b>1.1&lt;=rating&lt;=2</b>	<b>2.1&lt;=rating&lt;=3</b>	<b>3.1&lt;=rating&lt;=4</b>	<b>4.1&lt;=rating&lt;=5</b>
<b>Rating</b>	<b>Very Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>High</b>	<b>Very High</b>

**This Course is having HIGH association with Programme Outcome and Programme Specific Outcome**

## **UNIT I**

Social Work Research: Meaning, Definition, Types – Qualitative, Quantitative and Mixed, Purpose of Research, Social Research and Social Work Research. Scientific Method: Nature, Characteristics, Purpose and Steps in Research Process; Concepts: Operationalization of Concepts, Variables and its Types, Hypothesis: Sources, Formulation, Attributes of Hypothesis and Types. Review of the Literature.

## **UNIT II**

Research Design and Sampling: Types of Research Design: Concept and Types. Identification and Formulation of Research Problems. Sampling: Definition, Principles, Types and procedures; Population and Universe; Measurement of Scales: Meaning, Concept; Levels of Measurement; Validity and Reliability.

## **UNIT III**

Sources and Methods of Data Collection: Sources: Primary and Secondary; Quantitative Method Research Tools: Observation, Survey Methods: Interview Guide, Interview Schedule, and Questionnaire: Construction of Questionnaire or Interview Schedule – Concept, Types of Questions. Qualitative Method: Focused Group Discussion and Case Studies. Pilot Study and Pre- testing.

## **UNIT IV**

Data Processing and Analysis: Editing, Coding, Code Book preparation, Frequency distribution, Tabulation; Diagrammatic and Graphical Representation of Data: Types, Report writing and Referencing; Interpretation and Discussion of results. Agencies involved in Social Research; Ethical Considerations of Social Work Research. Research Proposal Writing.

## **UNIT V**

Social Statistics: Statistics: Meaning, Use and its Limitations in Social Work Research, Descriptive and Inferential Statistics, Measures of Central Tendency: Arithmetic Mean, Median and Mode, Measures of Dispersion: Range, Standard Deviation and Mean Deviation. Tests of significance: 't' Test, Chi-Square Test, ANOVA. Correlation: Meaning, Types and Uses. Karl Pearson's Coefficient of Correlation and Rank Correlation, Spearman's Rank Correlation. Manual Calculation: Mean, Median, Mode, Standard Deviation, Correlation, Chi-Square Test.

**TEXT BOOKS:**

1. Annie E. Fortune, William J. Beird, 2017. Research in Social Work, 3rd edition, Rawat Publications.
2. Dr. N. Arumugam, Research Methodology for Life Sciences, Saras Publications.
3. P. Ravi Lochanan, 2013, Research Methodology with Business Correspondence and Report Writing, Margham Publications.
4. PC. Vainketesh, 2012, Essentials of Research Methodology, Mark Publishers.
5. Professor D. K. Karyap, 2017The Hand Book of Social Work Research and Methods, Shikar Publications.
6. Robert C. Bogdan Sari Knopp Biklen, Qualitative Research for Education an Introduction to Theories and Methods, Fifth Edition.

**REFERENCE BOOKS:**

1. Ahuja R, 2010, Research Methods, Rawat Publications, Jaipur.
2. Alston M, Bowles W, 2012, Research for Social Workers, An introduction to methods, 3<sup>rd</sup> Edition, Australian Publications, Australia.
3. Babbie E, 2013, The Practice of Social Research, 13<sup>th</sup> Edition Cengage Learning, USA.
4. Chakraborty D, 2009, Research Methodology, SAURABH Publishing, New Delhi.
5. Dawson C, 2010, Introduction to Research Methods, A practical guide for anyone undertaking aResearch Project, Viva Books, New Delhi.
6. Gupta B L, 2010, Research studies in Staff Development, Mahamaya Publishing house, NewDelhi.
7. Pawar B S, 2009, Theory building for Hypothesis Specification in Organizational Studies,Response Books, New Delhi.
8. Rajathi A, Chandran P, 2010, SPSS for you, MJP Publications, Chennai
9. Tripathi P C, 2010, Research Methodology in Social Sciences, Sultan Chand and Sons, NewDelhi.

I – M.S.W	<b>SOCIAL WELFARE ADMINISTRATION AND SOCIAL LEGISLATIONS</b>	<b>Code: PSW22A</b>
<b>SEMESTER – II</b>		<b>HOURS: 5</b>
<b>CORE– V</b>		<b>CREDIT: 4</b>

**OBJECTIVE:**

To gain the competences in social work administration and to acquire knowledge on various social legislations in India

**COURSE OUTCOMES (COs):**

After completing this course, students will:

**CO1:** To understand the procedures and functions of Social Welfare Organisation.

**CO2:** To know the administrative process of Social Welfare Organizations.

**CO3:** To gain knowledge on policies, legislations and related concepts.

**CO4:** To acquire knowledge on social legislations for the underprivileged people.

**CO5:** To understand implementation of various legislations for the safeguard of women and children.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER II	COURSE CODE: PSW22A					COURSE TITLE: SOCIAL WELFARE ADMINISTRATION AND SOCIAL LEGISLATIONS					HOURS: 5	CREDITS: 4
COURSE OUTCOMES (CO)	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)					MEAN SCORE OF CO'S	
	PO 1	PO 2	PO 3	PO 4	PO 5	PS O1	PS O2	PS O3	PS O4	PS O5		
CO1	5	3	4	4	5	5	4	3	4	4	4.1	
CO2	5	3	5	3	4	5	4	3	4	5	4.1	
CO3	5	3	5	4	4	5	4	3	4	5	4.2	
CO4	4	3	4	3	3	4	3	2	2	3	3.1	
CO5	4	3	4	3	4	4	3	3	4	4	3.6	
<b>Mean Overall Score</b>											<b>3.82</b>	

**Result: The Score of this Course is 3.82 (High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcome and Programme Specific Outcome.

## UNIT I

Social Welfare Organization: Concept, Objectives, Types, Organizational structure – Functions of Boards and committees, Qualities of an Executive. Procedures in Registering an organization - Societies Registration Act, 1860 (Recent amendment), Indian Trust Act, 1882 (Recent amendment), Section 8 of Indian Companies Act, 2013 (Recent amendment).

## UNIT II

Social Welfare Administration Process: Meaning, Administrative Principles: POSDCORB, Office administration: Meaning, maintenance of records. Accounting and Auditing, Fundraising practice, Exemption from Income tax. Foreign Contribution and Regulation Act – 1976 (FCRA Latest amendment 2020)

## UNIT III

Social Policy: Meaning, Objectives. Policies in India – Education, Health, Environment, Child, Women, Elderly, Disabled. Introduction to Indian Constitution: Fundamental Rights, Duties and Directive Principles of State Policy. Indian Judicial System – Law enactment procedure and agencies. Public Interest Litigation. Lok Adalat, Family Court Social legislation: Meaning, Definition, Scope. Free Legal Aid. Indian Penal Code.

## UNIT IV

Legislations related to Underprivileged: Protection of Civil Rights Act 1955; The SC/ST (Prevention of Atrocities) Act, 1989 & Amendment Act 2015; Protection of Human Rights Act, 1993; Rights of Persons with Disabilities Act 2016. Legislations related to Labour: Rural Employment Guarantee Act, 2005, Bonded Labour System (Abolition) Act, 1976

## UNIT V

Legislations related to Children: The Juvenile Justice (Care and Protection of Children), Act 2015; Hindu Adoption and Maintenance Act 1956; Child Labour (Prohibition and Regulation) Act, 1986; Protection of Children from Sexual Offences (POCSO) Act, 2012. Legislations related to Women: The Protection of Women from Domestic Violence Act, 2005; Immoral Traffic (Prevention) Act, 1956; Dowry Prohibition Act, 1961; Indecent Representation of Women (Prohibition) Act, 1986; Prevention of Sexual Harassment at Work Place Act, 2013; Pre-Natal Diagnostic Techniques (Regulation and Prevention of Misuse) Act, 1994.



**TEXT BOOKS:**

1. Bradford W. Shea, Charles J. Horejsi, 2011, Techniques and Guidance for Social Work Practice Ninth Edition, Eastern Economy Edition.
2. D. Paul Chowdhry Social Welfare Administration
3. P. D Mishra, Social Work Philosophy and Methods, Inter India Publications.
4. Roger A. Lohmann, Nancy Lohmann, 2015, Social Administration, Rawat Publications.
5. Sanjay Bhattacharya, 2017, Social Welfare Administration and Development, Rawat Publications.
6. Suresh Chandra Anne Karen Trollope, 2015, Non-Governmental Organization Origin and Development, Rawat Publications.

**REFERENCE BOOKS:**

1. Batra, Nitin. (2004). Administration of social Welfare in India. Jaipur: Raj Publishing House.
2. Bhattachary, Sanjay. (2009). Social Work Administration and Development. New Delhi: Rawat Publication
3. Gaikwad, P. E. (2004). Law Basic Concepts. Pune: Yashada.
4. Gangrade, K.D. (1978). Social Legislation in India Vol. 1 & 2, Concept Publishing Co. New Delhi.
5. Mathew, P. D. (1993). Constitution of India Simplified, New Delhi: Indian Social Institute.
6. Purohit, B. R. & Joshi, Sandeep (Ed) (2003). Social Justice in India, Jaipur: Rawat Publication.
7. Shanmuga Velayutham, K, (1998). Social Legislation and Social Change, Vazha Valamudan Publishers, Chennai.
8. Sooryamoorthy R and Gangrade K.D. (2006). NGOs in India-A cross Sectional study New Delhi: Rawat Publication.

<b>I M.S.W</b>	<b>COMMUNITY ORGANIZATION AND SOCIAL ACTION</b>	<b>PSW23A</b>
<b>SEMESTER – II</b>		<b>HRS/WK : 5</b>
<b>CORE– 6</b>		<b>CREDIT : 4</b>

**OBJECTIVE:**

To know about Community Organization and Social Action.

**COURSE OUTCOMES (COs):**

After completing this course, students will:

CO1: Develop theoretical understanding on Community Organization as a method Social Work.

CO2: Be aware of theories, models and approaches of Community Organization.

CO3: Practice Community Organization as a method of Social Work in the field of Social Work.

CO4: Extend theoretical understanding on Social Action as a method of Social Work.

CO5: Apply Social Action as a method of Social Work.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

<b>SEMESTER I</b>	<b>COURSE CODE: PSW23A</b>					<b>COURSE TITLE: COMMUNITY ORGANIZATION AND SOCIAL ACTION</b>					<b>HOURS: 5</b>	<b>CREDITS: 4</b>
<b>COURSE OUTCOMES (CO)</b>	<b>PROGRAMME OUTCOMES (PO)</b>					<b>PROGRAMME SPECIFIC OUTCOMES (PSO)</b>					<b>MEAN SCORE OF CO'S</b>	
	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PSO 1</b>	<b>PSO 2</b>	<b>PSO 3</b>	<b>PSO 4</b>	<b>PSO 5</b>		
<b>CO1</b>	5	5	5	4	4	5	5	5	4	4	<b>4.6</b>	
<b>CO2</b>	5	5	5	4	5	5	5	5	4	5	<b>4.2</b>	
<b>CO3</b>	5	4	5	4	5	5	5	5	4	5	<b>4.7</b>	
<b>CO4</b>	5	4	5	4	5	5	5	4	4	5	<b>4.6</b>	
<b>CO5</b>	5	5	5	4	4	5	5	4	4	4	<b>4.5</b>	
<b>Mean Overall Score</b>											<b>4.5</b>	

**Result: The Score of this Course is 4.5(Very High)**

<b>Association</b>	<b>1%-20%</b>	<b>21%-40%</b>	<b>41%-60%</b>	<b>61%-80%</b>	<b>81%-100%</b>
<b>Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Interval</b>	<b>0&lt;=rating&lt;=1</b>	<b>1.1&lt;=rating&lt;=2</b>	<b>2.1&lt;=rating&lt;=3</b>	<b>3.1&lt;=rating&lt;=4</b>	<b>4.1&lt;=rating&lt;=5</b>
<b>Rating</b>	<b>Very Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>High</b>	<b>Very High</b>

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome

## **UNIT I**

Community: Meaning, Types and Characteristics; Community Power Structure and Minority groups. Community Dynamics: Integrative and Disintegrative Processes in the Community. Leadership: Definitions, Types and Qualities; Leadership in different types of Communities.

## **UNIT II**

Community Organization: Concepts, Definition, Objectives, Models, Philosophy, Approaches and Principles; Community Organization as a method of social work; Community Welfare Councils and Community Chests. Methods of Community Organization: Planning, Education, Communication, Community Participation, Collective Decision Making, Involvement of groups and Organizations, Resource Mobilization, Co-ordination. Skills in Community organization. Awareness Creation based on social issues.

## **UNIT III**

Phases of Community Organization: Assessment of community using PRA, Study, Assessment, Discussion, Organization, Action, Evaluation, Modification, Continuation; Community study; Community Organization in emergencies like Fire, Famine, Flood, Drought, Earthquake and War; Community Organization at Local, State and National level; Community organization in Rural, Urban, Slum and Tribal Areas.

## **UNIT IV**

Social Action: Definition, Objectives, Principles, Approaches, Methods and Strategies; Social Action as Method of Social Work; Social work and social action. Medha Patkar's & Sunderlal Bahuguna's case studies. Roles and Responsibilities of Social Activist. Process of Social Action; Scope for Social Action in India.

## **UNIT V**

Social Reform and Social movements - Various contributions to the theory of Social Action: Mahatma Gandhi, Periyar, Ambedkar, Paulo Freire, Saul Alinsky, Martin Luther King, and Karl Marx. Role of Social Workers in Community Organization and Social Action.

**TEXT BOOKS:**

1. Asha Ramagonda Patil, 2013, Community Organization and Development an Indian Perspective, Eastern Economy Edition.
2. Christopher, A.J and William, Thomas, 2006, Community Organization and Social Action, Himalaya Publication House, New Delhi.
3. Gangrade, K.D, Community Organization in India, Popular Prakasan, Bombay.
4. Samuel H Taylor, 2013, Theory and Practice of Community Social Work, New Delhi.
5. W. Sheafor Charles J. Horejsi, 2011, Techniques and Guidance for Social Work Practice, Ninth Edition, Bradford Eastern Economy Edition.

**REFERENCE BOOKS:**

1. Beher A & Samuel J. 2006. Social Watch in India: Citizens Report on Governance and Development, Pune: NCAS
2. Chambers Robert 2005 Ideas for Development, Earth Scan, London
3. Christopher, A.J and William, Thomas, 2006, Community Organization and Social Action, Himalaya Publication House, New Delhi.
4. Delgado, M. & Humm-Delgado, D. (2013). Assets assessments and community social work practice. New York: Oxford University Press.
5. Homan, M.S. (2011). Theoretical frameworks for community change.
6. Macmillan, Wayne: Community organization for social welfare, University of Chicago press.

<b>I – M.S.W</b>	<b>FIELD WORK - II</b>	<b>PSWF2A</b>
<b>SEMESTER – II</b>		<b>HOURS : 9*</b>
<b>CORE PRACTICAL – II</b>		<b>CREDIT : 4</b>

**OBJECTIVE:**

To practice the theoretical knowledge in the field of NGO/Hospital/Company settings.

**COURSE OUTCOMES (COs):**

After completing this course, students will:

CO1: Be exposed as a social worker in different settings.

CO2: Be exposed to different NGO, agency and company.

CO3: Be known to handle the client as a case worker.

CO4: Understand the group work process.

CO5: Organize Community organization programme.

Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes

<b>SEMESTER II</b>	<b>COURSE CODE: PSWF2A</b>					<b>COURSE CONCURRENT WORK PRACTICUM – II</b>					<b>TITLE: FIELD</b>	<b>HOURS : 9</b>	<b>CREDITS: 4</b>
<b>COURSE OUTCOMES (CO)</b>	<b>PROGRAMME OUTCOMES (PO)</b>					<b>PROGRAMME SPECIFIC OUTCOMES (PSO)</b>					<b>MEAN SCORE OF CO'S</b>		
	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PSO 1</b>	<b>PSO 2</b>	<b>PSO 3</b>	<b>PSO 4</b>	<b>PSO 5</b>			
<b>CO1</b>	5	4	5	5	5	5	5	4	5	5	<b>4.8</b>		
<b>CO2</b>	5	4	5	5	5	5	4	4	5	5	<b>4.7</b>		
<b>CO3</b>	5	4	5	4	5	5	5	4	5	5	<b>4.7</b>		
<b>CO4</b>	4	3	5	4	5	5	5	3	5	5	<b>4.4</b>		
<b>CO5</b>	5	3	4	5	4	5	5	3	5	5	<b>4.4</b>		
<b>Mean Overall Score</b>											<b>4.6</b>		

**Result: The Score of this Course is 4.6(Very High)**

<b>Association</b>	<b>1%-20%</b>	<b>21%-40%</b>	<b>41%-60%</b>	<b>61%-80%</b>	<b>81%-100%</b>
<b>Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Interval</b>	<b>0&lt;=rating&lt;=1</b>	<b>1.1&lt;=rating&lt;=2</b>	<b>2.1&lt;=rating&lt;=3</b>	<b>3.1&lt;=rating&lt;=4</b>	<b>4.1&lt;=rating&lt;=5</b>
<b>Rating</b>	<b>Very Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>High</b>	<b>Very High</b>

This Course is having VERY HIGH association with Programme Outcome and Programme Specific Outcome.

The first year students during the second semester go for practice based social work for two days in a week and expected to spend a minimum of 10 hours per week in the field. The first year students are placed in villages or hospitals or schools or NGOs or government offices or counselling centers or welfare organizations or service organization for a semester.

During the placement they have to practice all the primary methods of social work. One has to complete 5 cases in casework, two group work following all the stages of group work practice with 5 sessions which include the formation, naming, fixing of objectives, organizing programmes based on the objectives, evaluation, sociometry and sociogram. In the community students are expected to conduct one programme or solve an issue of the community following the principles of community organization and social action. The community organization programme is being organized by each student to promote extension activities towards different villages, institutions and organizations.

Every week the students write a report of their activities and submit to the concerned field work supervisor. The supervisor conducts individual and group conference every week regularly. At the end of the semester Viva- Voce is conducted by two examiners, one being an external examiner and the other would be the supervisor. 20 marks are being awarded by the internal faculty supervisor, 20 Marks are awarded by the Agency Supervisor and 60 marks are being awarded by the external examiner.

#### **Tasks to be accomplished in the Field Work:**

1. Understanding field work agency and the beneficiaries of programmes implemented by the agency.
2. Equipping knowledge of administrative procedures, programme management, intervention models and so on for human development.
3. Practicing primary and secondary methods in the field for experiential learning.
4. Undertaking the components of field work instructed by the department.
5. Developing skills and nurturing values to be a perfect social work professional.

#### **Process of Field Work:**

- Field work for two days in every week
- Reporting, recording and documenting Field work activities.
- Faculty-student individual conference or group conferences

#### **Marks Allotments**

S. No	Assigned Work	Internal	External
		Faculty	External Examiner
1	Case Work, Group Work, Community Organization Programme	40	
2	Presentation, Quality in Components, Communication		60
	<b>Total</b>		<b>100</b>

\* Number of hours spent for two days in a week by a student in the field.

<b>I – M.S.W</b>	<b>COUNSELLING: THEORY AND PRACTICE</b>	<b>CODE: EPSW24A</b>
<b>SEMESTER – II</b>		<b>HRS/WK: 4</b>
<b>ELECTIVE II (A)</b>		<b>CREDIT: 4</b>

**OBJECTIVE:**

To understand the theories of Counselling and its application in different fields.

**COURSE OUTCOMES (COs)**

After completing this course, students will:

CO1: Understand counselling as a professional practice.

CO2: Acquire knowledge on the process and theories related to counselling.

CO3: Know about the practice of counselling in different setting.

CO4: Gain knowledge on family and marital counselling.

CO5: Learn the ethical principles and professional guidelines for counselling practice.

Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes

<b>SEMESTER II</b>	<b>COURSE CODE: EPSW24A</b>					<b>COURSE TITLE: COUNSELLING: THEORY AND PRACTICE</b>					<b>HOURS:4</b>	<b>CREDITS:4</b>
<b>COURSE OUTCOMES (CO)</b>	<b>PROGRAMME OUTCOMES (PO)</b>					<b>PROGRAMME SPECIFIC OUTCOMES (PSO)</b>					<b>MEAN SCORE OF CO'S</b>	
	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PSO 1</b>	<b>PSO 2</b>	<b>PSO 3</b>	<b>PSO 4</b>	<b>PSO 5</b>		
<b>CO1</b>	5	4	5	4	4	4	4	3	4	4	<b>4.1</b>	
<b>CO2</b>	5	3	4	3	4	5	5	4	4	4	<b>4.1</b>	
<b>CO3</b>	4	3	5	3	4	5	5	4	4	5	<b>4.2</b>	
<b>CO4</b>	5	4	4	3	5	5	5	3	4	5	<b>4.3</b>	
<b>CO5</b>	5	4	5	4	4	5	5	4	4	5	<b>4.5</b>	
<b>Mean Overall Score</b>											<b>4.24</b>	

**Result: The Score of this Course is 4.24(Very High)**

<b>Association</b>	<b>1%-20%</b>	<b>21%-40%</b>	<b>41%-60%</b>	<b>61%-80%</b>	<b>81%-100%</b>
<b>Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Interval</b>	<b>0&lt;=rating&lt;=1</b>	<b>1.1&lt;=rating&lt;=2</b>	<b>2.1&lt;=rating&lt;=3</b>	<b>3.1&lt;=rating&lt;=4</b>	<b>4.1&lt;=rating&lt;=5</b>
<b>Rating</b>	<b>Very Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>High</b>	<b>Very High</b>

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome

## UNIT I

Introduction to Counselling: Meaning, Definition, Types, Needs, Importance of Counselling and Professional Counselling. Basic Principles of Counselling: Participation, Individualization, Confidentiality, Communication, Acceptance, Self-Confidence, Self-Awareness and other Principles governing the Counselling Relationship. Qualities of Counsellor.

## UNIT II

Counselling Process: Interview and its Significance in Counselling – Use of Observation in Counselling and Understanding of Emotions in Counselling. Theories of Counselling: Psychoanalytic, Adlerian, Client Centered, Behavioral, Rational Emotion, Reality, Gestalt, Transactional analysis, Family System Theory and Electric Theories.

## UNIT III

Counsellor as Professional; Ethical standards in Counselling; Relevance of Counselling as a Social Work Practice; Role of Professional Social Worker in Counselling field. Alternative Therapies: Art, Music, Recreation, Laughter, Play and Yoga – Counselling amidst COVID19 Pandemic Situation.

## UNIT IV

Family and Marital Counselling: Family System – Factors affecting Communication in families – Marriage and family; Aims and types of Marriage; factors contributing to marital conflicts – Family Counselling; Infertility Counselling; Marital Therapy; Pre – Marital Counselling – Approaches to Marital therapy

## UNIT V

Counselling in different settings: School Counselling, Career Counselling, Industrial Counselling, Alcoholic and De-Addiction Counselling, Crisis and Trauma Counselling, Supportive Counselling with Persons Living with HIV, TB Patients, Persons with Disabilities, Counselling against Suicidal thoughts and Community Counselling. Application of Counselling theory in Social Work Practice - Techniques and Strategies in Counselling. Barriers to Effective Counselling Sessions; Counselling Evaluation.



#### TEXT BOOKS:

1. Colin Feltam, Windy Dryden, 2010. Brief Counselling a Practical Integrative Approach, Tata McGraw – Hill publishing company limited, New Delhi.
2. Baumgardener S, Crothers M 2015, Positive Psychology, Dorling Kindersley.
3. Robert L. Gibson, Marianne H. Mitchell, 2009, Introduction to Counselling and Guidance, PHI Learning Private Limited, New Delhi.
4. S. Narayana Rao, 2007, Counselling and Guidance, Tata McGraw – Hill publishing company limited, 2nd Edition, New Delhi.
5. Samuel T. Gladding, 2009, Counselling A Comprehensive Profession, Pearson, New Delhi.
6. Seligman M 2013, Authentic Happiness, Atria Books
7. Snyder, Lopez, & Pedrotti, 2011, Positive Psychology: The Science and Practical explorations of human strength 2nd Edition, Sage Publications.
8. Sister Mary Vishala, 2006, Guidance and Counselling (for teachers, parents & students), S. Chand & Company Limited, New Delhi.

#### REFERENCE BOOKS:

1. Egan, Gerard, 2006 The skilled helper: A problem management and opportunity, Development Approach to helping, Wadsworth publishers, Boston, USA
2. Mcleod & John, 2003 Introduction to Counselling, Open university press, UK
3. Neukrug. E, 2012 Counselling theory and practice.
4. Palmer, 2004 Counselling, The BAC Counselling reader, British Association for Counselling, Vol. 1 & 2, Sage publications, New Delhi, India
5. Randy J Larsen. Personality psychology, New Delhi, 2011
6. Rao, Narayana, 2003 Counselling and Guidance, Tata McGraw Hill, New Delhi. India.
7. Sanders, 2002. First steps in Counselling, PCCS Books Ltd, UK.
8. Seligman M, 2011, Flourish: A New Understanding of Happiness and Wellbeing: and How to Achieve Them. Nicholas Brealey Publishing, London, Boston.

<b>I – M.S.W</b>	<b>ENTREPRENEURSHIP DEVELOPMENT</b>	<b>EPSW24B</b>
<b>SEMESTER – II</b>		<b>HRS/WK: 4</b>
<b>ELECTIVE - II (B)</b>		<b>CREDIT: 4</b>

**OBJECTIVE:**

To understand the concept of Entrepreneurship Development.

**COURSE OUTCOMES (COs):**

After completing this course, students will:

CO1: To enable the students to understand the concept of Entrepreneurship and to learn the professional behaviour expected of an entrepreneur.

CO2: To identify significant changes and trends which create business opportunities and to analyse the environment for potential business opportunities.

CO3: To provide conceptual exposure on converting idea to a successful entrepreneurial firm.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER II	COURSE CODE: EPSW24B					COURSE TITLE: ENTREPRENEURSHIP DEVELOPMENT					HOURS: 4	CREDITS: 4
	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)					MEAN SCORE OF CO'S	
COURSE OUTCOMES (CO)	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5		
CO1	5	5	4	4	5	5	5	4	4	4	4.5	
CO2	4	3	4	3	4	5	5	4	4	4	4	
CO3	3	3	3	4	4	4	3	3	4	4	3.5	
CO4	5	4	4	4	4	5	5	4	4	4	4.3	
CO5	5	4	4	4	5	5	4	5	4	4	4.4	
<b>Mean Overall Score</b>											<b>4.14</b>	

**Result: The Score of this Course is 4.14(Very High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having VERYHIGH association with Programme Outcome and Programme Specific Outcome

**UNIT I:**

Entrepreneurship Entrepreneur: Meaning of entrepreneurship – Types of Entrepreneurship – Traits of entrepreneurship – Factors promoting entrepreneurship- Barriers to entrepreneurship- the entrepreneurial culture- Stages in entrepreneurial process – Women entrepreneurship and economic development- SHG.

**UNIT II:**

Developing Successful Business Ideas Recognizing opportunities – trend analysis – generating ideas – Brainstorming, Focus Groups, Surveys, Customer advisory boards, Day in the life research – Encouraging focal point for ideas and creativity at a firm level-Protecting ideas from being lost or stolen – Patents and IPR.

**UNIT III:**

Opportunity Identification and Evaluation Opportunity identification and product/service selection – Generation and screening the project ideas – Market analysis, Technical analysis, Cost benefit analysis and network analysis- Project formulation – Assessment of project feasibility- Dealing with basic and initial problems of setting up of Enterprises.

**UNIT IV:**

Business Planning Process Meaning of business plan- Business plan process- Advantages of business planning- preparing a model project report for starting a new venture (Team-based project work).

**UNIT V:**

Funding Sources of Finance- Venture capital- Venture capital process- Business angles- Commercial banks- Government Grants and Schemes.

**TEXT BOOKS:**

1. Reddy, Entrepreneurship: Text & Cases - Cengage, New Delhi.
2. Kuratko/Rao, Entrepreneurship: a South Asian Perspective - Cengage, New Delhi.
3. Leach/Melicher, Entrepreneurial Finance – Cengage, New Delhi.
4. K. Sundar – Entrepreneurship Development – Vijay Nicole Imprints private Limited
5. Khanka S.S., Entrepreneurial Development, S. Chand & Co. Ltd., New Delhi, 2001.
6. Sangeeta Sharma, Entrepreneurship Development, PHI Learning Pvt.. Ltd., 2016.

**REFERENCE BOOKS:**

1. Barringer, B., *Entrepreneurship: Successfully Launching New Ventures*, 3rd Edition, Pearson, 2011.
2. Bessant, J., and Tidd, J., *Innovation and Entrepreneurship*, 2nd Edition, John Wiley & Sons, 2011.
3. Desai, V., *Small Scale Industries and Entrepreneurship*, Himalaya Publishing House, 2011.
4. Donald, F.K., *Entrepreneurship- Theory, Process and Practice*, 9th Edition, Cengage Learning, 2014.
5. Hirsch, R.D., Peters, M. and Shepherd, D., *Entrepreneurship*, 6th Edition, Tata McGraw-Hill Education Pvt.Ltd., 2006.
6. Mathew, J.M., *Entrepreneurship Theory at Cross Roads: Paradigms and Praxis*, 2nd Edition, Dream Tech, 2006.
7. Morse, E., and Mitchell, R., *Cases in Entrepreneurship: The Venture Creation Process*, Sage South Asia, 2008.
8. Nagendra and Manjunath, V.S., *Entrepreneurship and Management*, Pearson, 2010.
9. Reddy, N., *Entrepreneurship: Text and Cases*, Cengage Learning, 2010.
10. Roy, R., *Entrepreneurship*, 2nd Edition, Oxford University Press, 2011.
11. Stokes, D., and Wilson, N., *Small Business Management and entrepreneurship*, 6th Edition, Cengage Learning, 2010.

<b>I – M.S.W</b>	<b>LIFE SKILLS FOR SOCIAL WORK</b>	<b>PSWS1A</b>
<b>SEMESTER – II</b>		<b>HOURS: 2</b>
<b>SKILL</b>		<b>CREDITS: 2</b>

**OBJECTIVE:**

To develop the skills which are needed for social work profession.

**COURSE OUTCOMES (COs):**

After completing this course, students will:

CO1: Be exposed to their personal skills and development.

CO2: Be determined with the communication and writing skill.

CO3: Be capable of understanding human behavior.

CO4: Be equipped with the professional skills for their future development.

CO5: Learn the ethics and role of social worker.

Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcome

<b>SEMESTER II</b>	<b>COURSE CODE: PSWS1A</b>					<b>COURSE TITLE: LIFE SKILLS FOR SOCIAL WORK</b>					<b>HOUR :2</b>	<b>CREDITS:2</b>
<b>COURSE OUTCOMES (CO)</b>	<b>PROGRAMME OUTCOMES (PO)</b>					<b>PROGRAMME SPECIFIC OUTCOMES (PSO)</b>					<b>MEAN SCORE OF CO'S</b>	
	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PS O1</b>	<b>PS O2</b>	<b>PS O3</b>	<b>PS O4</b>	<b>PS O5</b>		
<b>CO1</b>	4	3	4	4	4	5	4	4	4	4	4	
<b>CO2</b>	4	3	4	4	4	4	3	4	4	4	4	<b>3.8</b>
<b>CO3</b>	4	4	3	4	4	4	5	4	4	4	4	
<b>CO4</b>	5	4	5	4	4	4	5	4	4	4	4	<b>4.3</b>
<b>CO5</b>	4	3	4	3	4	4	3	3	4	3	3	<b>3.5</b>
<b>Mean Overall Score</b>											<b>3.92</b>	

**Result: The Score of this Course is 3.92(High)**

<b>Association</b>	<b>1%-20%</b>	<b>21%-40%</b>	<b>41%-60%</b>	<b>61%-80%</b>	<b>81%-100%</b>
<b>Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Interval</b>	<b>0&lt;=rating&lt;=1</b>	<b>1.1&lt;=rating&lt;=2</b>	<b>2.1&lt;=rating&lt;=3</b>	<b>3.1&lt;=rating&lt;=4</b>	<b>4.1&lt;=rating&lt;=5</b>
<b>Rating</b>	<b>Very Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>High</b>	<b>Very High</b>

This Course is having HIGH association with Programme Outcome and Programme Specific Outcome

## UNIT I

Life Skills: Concept, Definition, Need and significance. Life Skills by WHO: Self- awareness, Empathy, Critical thinking, Creative thinking, Decision making, problem solving, Effective communication, interpersonal relationship, coping with stress, coping with emotion.

## UNIT II

Social Skills: i) Self-awareness: Definition, Concept of self, Techniques used for Self awareness. ii) Communication Skill: Introduction to Communication, Process and Barriers to Communication. Verbal, Non-verbal Communication and Body Language. iii) Inter Personal Skills: Meaning, need, components and techniques of inter personal skills. iv) Empathy: Meaning, need, difference between empathy and sympathy.

## UNIT III

Thinking Skills: i) Creative Thinking: Meaning, Concept, strategies to improve thinking. ii) Critical Thinking: Meaning, Concept, strategies to improve thinking. Functions of Left and right Brain. iii) Decision Making – Meaning, Importance, Skills. iv) Problem Solving Skills: meaning of problem and problem solving. Steps in problem solving. SMART Goals.

## UNIT IV

Negotiation Skills: i) Coping with Stress – Meaning, Need, Types of Coping Strategies, Importance ii) Coping with Emotions – Meaning, Skills, Need and Importance. Importance of IQ and EQ.

## UNIT V

Life Skills Practical Sessions: Preparing CV for jobs, Interview Skill, Attending Group Discussion, Attending a Mock Interview, SWOT analysis, Johari window, Communication and Presentation activities, Concept Development for Street play.

### **Text Book**

1. Sharma K. Lalita. (2022) Life Skills Education in India, Madhya Pradesh: Nitya Publication
2. Jain, Usha and Kumar Rajiv, Jain. (2014) Life Skills, New Delhi: Vayu Education of India

3. James, Larry. (2006) The First Books of Life Skills, Mumbai: Embassy Books
4. Verma Shalini (2014) Development of Life Skills and Professional Practice. Noida: Vikas Publishing House

### **Books for Reference**

1. Benjamin, Deepak. and Joseph Tintu P. (2020) Life Skills, Kerala: Pentex Book Publications
2. Mohanasundaram, (2020) Developing the Life Skills in Digital Era. Gujarat: Krishna Publication House
3. Rao Ravikanth K. and Dinakar P. (2016), Life Skills Education, Hyderabad: Neelkamal Publications
4. Saravanakumar A. R. (2016) Life Skills Education Through Life Long Learning Solapur: Laxmi Book Publication
5. Swift Keilly (2021) Life Skills – Creativity, Problem Solving, Mindfulness, Empathy, Teamwork. Great Britain: Dorling Kindersley Penguin Random House

### **Components to be presented for Viva-Voce Examination**

Viva-voce will be conducted at the end of the semester by the internal faculty. Each student is supposed to present the consolidated report of the following activities carried out during this semester:

1. SWOT Analysis
2. Johari Window
3. Communication and Presentation activities
4. Report of Street Play performed
5. IQ and EQ assessment test

**SPECIALISATION PAPER – I**  
**COMMUNITY DEVELOPMENT SPECIALIZATION**

<b>II – M.S.W</b>	<b>RURAL AND TRIBAL COMMUNITY DEVELOPMENT</b>	<b>PSW31A</b>
<b>SEMESTER – III</b>		<b>HOURS: 6</b>
<b>CORE – VII</b>		<b>CREDIT: 5</b>

**OBJECTIVE:**

To understand the concept of Rural and Tribal Community and its Development.

**COURSE OUTCOMES (COs):**

After completing this course, students will:

**CO1:** Be exposed to the rural community.

**CO2:** Be determined to the development of the community.

**CO3:** Be capable of understanding human behavior.

**CO4:** Be committed to work with the tribal community.

**CO5:** Be equipped with skills to work with the community.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER III	COURSE CODE: PSW31A					TITLE OF THE COURSE: RURAL AND TRIBAL COMMUNITY DEVELOPMENT					HOURS: 6	CREDITS: 5
COURSE OUTCOMES (CO)	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)					MEAN SCORE OF CO'S	
	P O1	P O2	P O3	P O4	P O5	PS O1	PS O2	PS O3	PS O4	PS O5		
CO1	5	4	5	3	4	5	5	4	4	4	4.3	
CO2	5	4	5	3	5	5	5	4	5	5	4.6	
CO3	5	4	5	3	5	5	5	5	4	5	4.6	
CO4	5	3	5	3	5	5	5	4	5	5	4.5	
CO5	5	4	5	3	4	5	5	5	5	4	4.5	
<b>Mean Overall Score</b>											<b>4.5</b>	

**Result: The Score of this Course is 4.5(Very High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	$0 \leq \text{rating} < 1$	$1.1 \leq \text{rating} < 2$	$2.1 \leq \text{rating} < 3$	$3.1 \leq \text{rating} < 4$	$4.1 \leq \text{rating} < 5$
Rating	<b>Very Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>High</b>	<b>Very High</b>

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome.



## **UNIT I**

Rural Community: Meaning, Characteristics. Assessment of Needs and Problems in the Community. Participatory Rural Appraisal – Meaning, Characteristics, Principles, Tools, Steps. Rural Organization and Rural Development. Rural Problems: Poverty, Illiteracy, Unemployment, Problems related to agriculture, Community Health.

## **UNIT II**

Community Development: Meaning, Objectives, Principles, and Models; methods; Earlier experiments in rural developments - Sriniketan Experiment and Marthandam Experiment. Rural Extension, Millennium Development and Sustainable Development Goals. Rural Development Administration and Panchayat Raj Institutions (PRI), 73rd Amendment and its Salient Features, Features of Tamil Nadu Panchayat Act 1994. Rural development Agencies: DRDA & BDO.

## **UNIT III**

Rural Development Programmes: Deen Dayal Antyodaya Yojana, National Rurban Mission (NRuM), Sansad Adarsh Gram Yojana, Pradhan Mantri Awaas Yojana - Gramin (PMAY -G), Pradhan Mantri Suraksha Bima Yojana (PMSBY), Digital Infrastructure for Knowledge Sharing (DIKSHA), MP's & MLA's Area development programme, IRDP, TRYSEM, MGNREGA. ICDS. National Institute of Rural Development and Panchayati Raj (NIRDPR).

## **UNIT IV**

Tribes: Definition, Concept, Characteristics of the Tribal Community; Nomadic and De-Notified Tribes; Regional Distribution of Tribes and Nehru's Panchasheel Principles of Tribes. Social System of Tribes: Socio economic conditions; Cultural and religious aspects; status of women: Status of Children; Tribal leadership and Political Participation -Local, State, and National levels.

## **UNIT V**

Problems of Tribes: Child Marriage, Poverty, Ill-Health, Illiteracy, Exploitation and atrocities on tribes. Tribal Resettlement and Rehabilitation and its related problems. Tribal Movements and Tribal Revolt, Naxalpari Movement. Tribal Development Programmes: Tribal Development Policies, Tribal Area Development Programme; Tribal Sub-Plans, Need and Importance of Social Work practice in Tribal areas. Problems in implementation of tribal development programmes.

## **TEXT BOOKS:**

1. Alison Gilchrist, Marilyn Taylor, Short Guide to Community Development.
2. Asha Ramagonda Patil, 2013, Community Organization and Development An Indian Perspective, PHI Learning Private Limited, Delhi.
3. Dr. P. V. Ramana Rao, Rural Development and Poverty Alleviation Programmes – NGNREGS, Aryan Publication, New Delhi.
4. Margaret Ledwith, 2006, Community Development – A Critical Approach, Rawat Publication, Jaipur.
5. Samuel H. Taylor and Robert W. Roberts, 2013, Theory and Practice of Community Social Work, Rawat Publications, Jaipur.

**REFERENCE BOOKS:**

1. Christopher, A J. and Thomas William. 2006. Community Organization and Social Action. New Delhi: Himalaya Publishing House.
2. Dutt & Sundaram. 2013, Indian Economy, Sultan& Chand, New Delhi.
3. Kumar, Somesh. 2004. Participatory Method in Community Work. New Delhi: Himalaya Publisher.
4. Sachinanda and Purnendu, 2001 Fifty Years of Rural Development in India, Firma KLM Pvt Ltd., Kolkata.
5. Suresh Chandra, Anne Karen Trollope, 2015, Non-Governmental Organizations, Rawat Publications,
6. William, A. Thomas and A. J. Christopher. 2011. Rural Development – concept and recent approaches. Jaipur: Rawat Publications.

## SPECIALISATION PAPER – I

### HUMAN RESOURCE MANAGEMENT SPECIALIZATION

II – M.S.W	HUMAN RESOURCE MANAGEMENT	PSW31B
SEMESTER – III		HOURS : 6
CORE–VII		CREDIT : 5

**OBJECTIVE:**

To understand the concept of Human Resource Management and related concepts.

**COURSE OUTCOMES (COs):**

After completing this course, students will:

**CO1:** Be exposed to the concept of human resource management.

**CO2:** Be determined to the process of human resource planning.

**CO3:** Be equipped with the knowledge on training and development.

**CO4:** Be capable of handling with administrative structure.

**CO5:** Learn the human resource development.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER III	COURSE CODE: PSW31B					TITLE OF THE COURSE: HUMAN RESOURCE MANAGEMENT					HOURS : 6	CREDITS:5
COURSE OUTCOMES (CO)	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)					MEAN SCORE OF CO'S	
	P01	P02	P03	P04	P05	PS01	PS02	PS03	PS04	PS05		
CO1	5	3	5	3	5	5	4	4	5	5	4.4	
CO2	5	3	5	3	5	5	4	4	5	5	4.4	
CO3	5	3	5	3	5	5	4	4	5	5	4.4	
CO4	5	3	5	3	5	5	4	4	5	5	4.4	
CO5	5	3	5	3	5	5	4	4	5	5	4.4	
<b>Mean Overall Score</b>											<b>4.4</b>	

**Result: The Score of this Course is 4.4(Very High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome

## **UNIT I**

Human Resource Management: Concept, Scope, Objectives, Principles of HRM, Evolution, Approaches, Structure, Policies and Functions of Human Resource Management. Principles, Emerging trends of Competencies and Roles of HR Professionals.

## **UNIT II**

Human Resource Planning: Concept, Objectives, Need, Process. Job Analysis: Uses, Content. Job Description, Job Specification. Recruitment: Meaning, Sources and Methods of Recruitment, induction, placement, attrition and retention. Selection: Meaning, Steps, Application Blank, Psychological test, Interviews and Physical Examination. Talent Acquisition: Goals, Policies, Sources and Methods. Compensation Management: Compensation structure, Factors influencing Compensation Plans and Policies. Incentive Schemes, Rewards, Recognition and employees engagement.

## **UNIT III**

Training and Development: Meaning, Importance, Purpose, Types and Methods, training need analysis. Wages and Salary Administration: Definition, Objectives, Process of Wage Determination, Methods of Wage payment, Principles of Wages, Factors influencing Wage and Salary administration, Fringe Benefits. Concept of Wage and Salary – Wage Theories – Types of wages – wage differentials – wages fixation – wage board- wage revision – Incentive Schemes – wages settlement.

## **UNIT IV**

Performance Appraisal Systems; types of performance appraisal – potential appraisal – Transfers and Promotions – Discharge, Superannuation, Suspension, Termination. Key Result Areas (KRA), Key Performance Indicators (KPI). Employee Retention – Concept, - Employee benefit plans. Disciplinary procedures – Domestic enquiry – Grievance Procedure — Retirement: Exit Interview, Retirement Benefits – Voluntary Retirement Scheme.

## **UNIT V**

Contemporary trends in HRM: Corporate Social Responsibility, Benchmarking, Core Competency, Business Process Outsourcing (BPO), Business Process Reengineering (BPR), Competency Mapping, Balanced Score Card, Skill Matrix, People Capability Maturity Model (PCMM), Quality Circle, Total Quality Management (TQM) and Total Productivity Maintenance (TPM), Six Sigma and Lean Sigma, 5S Model, and Kaizen. International Organization for Standardization (ISO). Occupational Health and Safety Assessment Series (OHSAS).

**TEXT BOOKS:**

1. BPP Learning Media, 2009, Human Resource Management, Viva Books, New Delhi.
2. Dr. S.S.Khanka, 2003 Human Resource Management text and cases S. Chand and Company Pvt. Ltd., New Delhi.
3. K. Aswathappa, 2008, Human Resource Management text and cases, Tata McGraw – Hill publishing company limited, New Delhi.
4. P. Subba Rao, 2016, Personnel and Human Resource Management Himalaya Publishing House, New Delhi.
5. VSP Rao, 2010, Human Resource Management text and cases, New Delhi: Excel Books.

**REFERENCE BOOKS:**

1. Andrew J. Dubrin, 2012 Essentials of Management, New York: Thomson Southwestern.
2. Bernadin John H, 2012, Human Resource Management, New York: McGraw Hill.
3. Ivancevich, 2012, Human Resource Management, New York: McGraw Hill.
4. Luis R.Gomez-Mejia, David B.Balkin, Robert L Cardy. 2012, Managing Human Resource. New Delhi: PHI Learning.
5. MonirTayeb. 2007, International Human Resource Management. New York: Oxford University Press.
6. Robert L. Mathis and John H. Jackson, 2007, Human Resource Management, New Delhi: Cengage Learning.
7. Uday Kumar Haldar, Juthika Sarkar.2012, Human Resource management. New Delhi: Oxford University Press.
8. Wayne Cascio, 2007, Managing Human Resource, New York: McGraw Hill.

## SPECIALISATION PAPER – I

### MEDICAL AND PSYCHIATRY SPECIALIZATION

II – M.S.W	<b>MEDICAL SOCIAL WORK</b>	PSW31C1
SEMESTER – III		HOURS: 6
CORE - VII		CREDIT: 5

**OBJECTIVE:**

To understand the concept of Medical social Work and role of Medical Social Worker.

**COURSE OUTCOMES (COs):**

After completing this course, students will:

**CO1:** Be exposed to the importance of medical social work.

**CO2:** Understand health care model and alternative system of health.

**CO3:** Be equipped with hospital administration.

**CO4:** Understand communicable and non-communicable disease.

**CO5:** Be applicable to work in hospital setting.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER III	COURSE CODE: PSW31C1					TITLE OF THE COURSE: MEDICAL SOCIAL WORK					HOURS: 6	CREDITS: 5
COURSE OUTCOMES (CO)	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)					MEAN SCORE OF CO'S	
	P01	P02	P03	P04	P05	PS01	PS02	PS03	PS04	PS05		
CO1	5	4	5	4	5	5	5	4	4	4	4.5	
CO2	4	4	4	3	4	4	4	4	5	4	4	
CO3	4	4	4	4	4	5	5	4	4	5	4.3	
CO4	5	4	5	5	4	5	5	4	4	5	4.6	
CO5	4	3	4	4	4	5	4	4	5	5	4.3	
<b>Mean Overall Score</b>											<b>4.34</b>	

**Result: The Score of this Course is 4.34(Very High)**

Association Scale	1% - 20%	21% - 40%	41% - 60%	61% - 80%	81% - 100%
Interval	0 <= rating < = 1	1.1 <= rating < = 2	2.1 <= rating < = 3	3.1 <= rating < = 4	4.1 <= rating < = 5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome

## **UNIT I**

Medical Social Work: concept, Definition, Need of medical social work –Role and functions of medical social worker. The meaning of health, hygiene, illness and handicap: medicine through the ages; changing concept of health: concept of patient as a person. Health Indicators and Health Statistics. Historical development in Medical Social Work in the West and in India. Trends, Scope and Limitations of Medical Social Work practice in India. Health Indicator and Health Statistics

## **UNIT II**

Health care models - medical health prevention and promotion model, integrative model and development model; holistic approach to health: alternative system of health – Ayurvedic, Yoga, Naturopathy, Unani, Sidha and Homeopathy (AYUSH) – Health Care delivery Systems, Overview of Human Anatomy.

## **UNIT III**

Organization and Administration of Medical Social Work department in Hospital. Present practice and equipment of medical social work in various setting. a) Government Hospital, Corporate and Private, Specific Disease Hospitals, Specialized Clinics, Community Health Centers, Blood Banks, Eye Banks, Health Camps b) Schools for the Physically and Mentally challenged, Sheltered Workshops, Residential institutions for Physically and Mentally Challenged.

## **UNIT IV**

Communicable and non-communicable diseases - TB, STD, AIDS, Polio, Covid-19. Diarrheal diseases. Malaria, typhoid, leprosy, leptospirosis. Major non communicable diseases - cancer, diabetes, hypertension, cardio disorders, neurological disorders, and asthma; physically challenged, Nutritional disorders, Occupational health problems, Women's health problems, Pediatric health problems and Geriatric health problems.

## **UNIT V**

Medical social work practices in different in Settings. Outpatient unit, ICU, Maternity and Paediatric ward, STD and HIV clinic, Cardiology department, TB sanatorium and Cancer hospitals. Role of Medical Social Worker in Organ Transplantation and Palliative Care Unit. Supportive services like tele-counselling and networking for practice of medical social work, teamwork in medical setting. Skills and techniques used in medical social work practice. Fund Mobilizing in Medical Social Work.

**TEXT BOOKS:**

1. Danna R. Bodenheimer. 2015, Real World Clinical Social Work: Find Your Voice and Find Your Way, New Social Worker Press.
2. Park K (2009) Preventive and Social Medicine.
3. Goel S.L (2007) Health Education: Theory and Practice.
4. Tabish S.A (2001) Hospital and Health services administration.
5. Goel S.L (2004) Health Care Management and Administration
6. John Webb, 2002, Medical Social Work: the Reference Book Paperback, Trafford Publishing.
7. Judith L. M. McCoyd, Toba Schwaber Kerson. Social Work in Health Settings: Practice in Context.
8. K. Park. 2013, Park Text Book of Preventive and Social Medicine, M/S BanarsidasBhanot Publishers.
9. Sarah Gehlert, Teri Browne, Handbook of Health Social Work.
10. Sharma Vivek. 2014. UGC NET Tutor Social Work, Arihant Publications New Delhi.

**REFERENCE BOOKS:**

1. Bradshaw & Bradshaw, 2004 Health Policy for Health Care Professional, Sage Publications, New Delhi.
2. Goel S.L (2004) Health Care Management and Administration.
3. Goel S.L (2007) Health Education: Theory and Practice.
4. Pondicherry Aids Control Society, 2007 Pregnancy, Byword books Private Limited.
5. Sarah Ghelert, 2006 Hand book of Health Social Work, John Wiley & Co., London
6. Sirohi, Anand, 2005 Modern Perspectives in Social Work, Dominant Publishers, New Delhi.
7. Tabish S.A (2001) Hospital and Health services administration.



## SPECIALISATION PAPER - II

### COMMUNITY DEVELOPMENT SPECIALIZATION

II – M.S.W	URBAN COMMUNITY DEVELOPMENT	PSW32A
SEMESTER – III		HOURS : 6
CORE - VIII		CREDIT : 5

**OBJECTIVE:**

To understand the concept of Urban Community Development and development scheme.

**COURSE OUTCOMES (COs):**

After completing this course, students will:

**CO1:** Be exposed to the urban communities.

**CO2:** Be aware of slum legislation.

**CO3:** Understand urban community development.

**CO4:** Be capable of handling urban administrative structure.

**CO5:** Learn the role of stake holders in urban community development.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER III	COURSE CODE: PSW32A					TITLE OF THE COURSE: URBAN COMMUNITY DEVELOPMENT					HOURS: 6	CREDITS: 5
COURSE OUTCOMES (CO)	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)					MEAN SCORE OF CO'S	
	P01	P02	P03	P04	P05	PS01	PS02	PS03	PS04	PS05		
CO1	5	4	5	3	4	5	5	4	4	4	4.3	
CO2	5	4	5	3	5	5	5	4	5	5	4.6	
CO3	5	4	5	3	5	5	5	5	4	5	4.6	
CO4	5	3	5	3	5	5	5	4	5	5	4.5	
CO5	5	4	5	3	4	5	5	5	5	4	4.5	
<b>Mean Overall Score</b>											<b>4.5</b>	

**Result: The Score of this Course is 4.5(Very High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome.

## **UNIT I**

Urbanization: Concept, Characteristics and Theories. Related Concepts: Corporation, Municipality, Town, City, Metropolis, Megapolis, Suburbs, Satellite Town, Smart Cities, Hinterland, Agglomeration, and Urbanism. Urbanization and Social Problems Urban Problems: Environmental issues, Crime, Accidents, Commercial Sex Work, Migration, Informal Sectors, Domestic Workers, Drug Addiction, Housing, Human Trafficking, Juvenile Delinquency, Urban Traffic Problems and Suicide.

## **UNIT II**

Slums: Definition, Causes, Characteristics, Socio-Psychological Issues of Slum Dwellers, Effect of Industrialization and Globalization on Slum. Displacement and Rehabilitation. Tamil Nadu Urban Habitat Development Board. Tamil Nadu Slum Area (Clearance and Improvement) Act 1971. Resettlement and Rehabilitation (R&R) Programmes. National Slum Development Programme. Urban Development Policy, Town planning and Rules of town planning. Urban Services and Urban Deficiencies, Housing and Urban Development Corporation (HUDCO).

## **UNIT III**

Urban Community Development: Meaning, Scope. Early Development Interventions: SPARK Mumbai, People Project of Action Aid, Oxfam, Unorganized Workers' Federation, National Domestic Workers Movement, National Slum Dwellers Federation. Welfare Extension Projects of Central Social Welfare Board. Problems in implementation of Urban Community Development Programmes.

## **UNIT IV**

Urban Municipal Administration- Structure, Composition, Functions and Current issues. Democratic functioning of Urban local bodies, 74th Constitutional Amendment, Governance and Citizen's Participation. E-Governance in Urban Development, National Urban Information System (NUIS).

## **UNIT V**

Urban Community Development Programme: Five Year Plans and Urban Development. Major National Missions: JNNURM (AMRUT), Housing for all 2022. Institutions and Government departments for Urban Development: CMDA, TNHB, CMWSSB. Urban Training Institutions: TNIUS, NIUA. Role and skills of Community Development Worker in Urban Community Development. Mechanisms to address Urban Social Concerns: 108 Service, Women Helpline, Child helpline.

**TEXT BOOKS:**

1. Asha Ramagonda Patil, 2013, Community Organization and Development in Social Work an Indian Perspective, PH Learning Private Ltd Delhi.
2. Dr. P. V. Ramana Rao, 2018 Rural Development and Poverty Alleviation Programmes, Aryan Publications New Delhi.
3. Jacob Z. Thudipara, 2017, Urban community development second edition, Rawat Publications, New Delhi.
4. Margaret Ledwith, 2006, Community Development a Critical Approach, Rawat Publications, Jaipur.
5. Samuel H Taylor, 2017, Theory and Practice of Community in Social Work, Rawat Publications, Jaipur.
6. Sharma Vivek. 2014. UGC NET Tutor Social Work, Arihant Publications New Delhi.

**REFERENCE BOOKS:**

1. Ashish Bose, 2001 India's Urbanization, Institute of Economic Growth, McGraw Hill, New Delhi.
2. Bala, 2000. Trends in Urbanization in India, Patel enterprises, New Delhi
3. Bhattacharya B, 2000 Urban Development in India, Shree Publishing House, New Delhi.
4. Census of India Government of India Publication, 2011.
5. H.U.Bijlani, 2013, Urban Problem, Centre for Urban Studies, Lipa, New Delhi
6. Harper Collins, 2014, Transforming our cities.
7. Mitra. Urbanization and Urban System in India, Oxford University Press, New Delhi.

## SPECIALISATION PAPER – II

### HUMAN RESOURCE MANAGEMENT SPECIALIZATION

<b>II – M.S.W</b>	<b>LABOUR LEGISLATIONS AND LABOUR WELFARE</b>	<b>PSW32B</b>
<b>SEMESTER – III</b>		<b>HRS/WK : 6</b>
<b>CORE - VIII</b>		<b>CREDIT : 5</b>

**OBJECTIVE:**

To get knowledge on Labour Legislations and Labour Welfare Related Acts.

**COURSE OUTCOMES (COs):**

After completing this course, students will:

**CO1:** Understand labour system.

**CO2:** Be aware of working environment and legislations.

**CO3:** Learn about the labour classification.

**CO4:** Understand the wage legislation.

**CO5:** Learn about the social legislation.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER III	COURSE CODE: PSW32B					TITLE OF THE COURSE: LABOUR LEGISLATIONS AND LABOUR WELFARE					HOURS :6	CREDITS:5
COURSE OUTCOMES (CO)	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)					MEAN SCORE OF CO'S	
	P01	P02	P03	P04	P05	PS01	PS02	PS03	PS04	PS05		
CO1	5	3	5	4	5	5	4	4	4	5	4.4	
CO2	5	4	4	3	5	5	4	3	4	4	4.1	
CO3	5	3	5	4	5	5	4	4	4	5	4.4	
CO4	5	4	4	3	5	5	4	3	4	4	4.1	
CO5	4	4	4	3	4	4	2	4	4	4	3.7	
<b>Mean Overall Score</b>											<b>4.14</b>	

**Result: The Score of this Course is 4.14(Very High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
<b>Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Interval</b>	<b>0&lt;=rating&lt;=1</b>	<b>1.1&lt;=rating&lt;=2</b>	<b>2.1&lt;=rating&lt;=3</b>	<b>3.1&lt;=rating&lt;=4</b>	<b>4.1&lt;=rating&lt;=5</b>
<b>Rating</b>	<b>Very Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>High</b>	<b>Very High</b>

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome.

## **UNIT I**

Labour- Concept, Labour Legislation, Concept, Objectives, Importance and Principles. Industrialization – Labourers at various occupations. Characteristics of Indian Labour – Indian Labour force, Classification and composition. Labour Problems in India - Labour Welfare: Concept, need, objectives, principles, theories, scope, limitations. Classification Administration of labour, - Central and State level . Labour Welfare Officer :Qualifications, Roles and Responsibilities.

## **UNIT II**

Legislations relating to working condition and safety: The Factories Act 1948, The Mines Act 1952, The Motor Transport Workmen Act 1961, Plantation Labour Act 1951, TamilNadu Shops and Establishment Act 1947.The Tamil Nadu Catering from Establishment Act 1952.

## **UNIT III**

Contract Labour (Regulations and Abolition) Act 1970, Inter-state Migrant Workman (Regulations of Employment and Condition of Service) Act-1979, The Apprentice Act 1961, Tamilnadu Industrial Establishment (National and Festival Holidays) Act 1958 and the Amendment of this Act, 2017, Labour Code on Industrial Relations Bill 2019.

## **UNIT IV**

Wage Legislations: The Employee’s Compensation Act 1923, Payment of wages Amendment Act 2017, Minimum wages Act 1948, Payment of Bonus Act 1965, Equal Remuneration Act1976. The Employment Exchange (Compulsory Notification of Vaccancies) Act – 1959.

## **UNIT V**

Social Security Legislations: Employees State Insurance Act 1948, Employees Provident Fund Act 1952, Payment of Gratuity Act 1972, Maternity benefit Act 1961. The Tamil Nadu Industrial Establishments (Conferment of Permanent Status to Workmen) Act, 1981.

## **TEXT BOOKS:**

1. Punekar Deodhar Sankaran, 1992, Labour Welfare Trade Unionism and Industrial Relations, Himalaya Publishing House.
2. RC Saxena, K Nath, 1996, Labour Problems and Social Welfare, Co Meeru Publications.
3. RC Saxena. 1998. Labour Relations in India. Prakashan Kendra.
4. SC Srivastava, 1995, Industrial Relations and Labour Laws, Vikas Publishing House, Pvt Ltd.
5. ShamaVivek. 2014. UGC NET Tutor Social Work, Arihant Publications New Delhi.

## **REFERENCE BOOKS::**

1. Babu Sharath and Rashmi Shetty. 2007. Social Justice and Labour Jurisprudence. New Delhi: SAGE Publication.
2. Kapoor, N.D. 1993. Elements of Industrial Law. New Delhi: Sultan Chand & Sons.
3. Kapoor, N.D. 1995. Hand Book of Industrial Law. New Delhi: Sultan chand & Company.
4. Ramaswamy, E.A. & Uma Ramaswamy. 1981. Industry and Labour: An Introduction New Delhi: Oxford University Press.
5. Vaidyanathan, S. 1986. Factory Laws Applicable in Tamilnadu, Vols: 1,2,3, Madras:Madras Bood Agency.

## SPECIALISATION PAPER II

### MEDICAL AND PSYCHIATRY SPECIALIZATION

II – M.S.W	MENTAL HEALTH AND SOCIAL WORK	PSW32C
SEMESTER – III		HOURS : 6
CORE - VIII		CREDIT : 5

**OBJECTIVE:**

To understand the concept of mental health and kinds of disorders.

**COURSE OUTCOMES (COs):**

After completing this course, students will:

**CO1:** Be exposed to the mental health.

**CO2:** Learn about stress and coping mechanism.

**CO3:** Gain knowledge about psychiatric assessment.

**CO4:** Understand the neurotic and psychotic disorder.

**CO5:** Learn about the childhood disorder.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER II	COURSE CODE: PSW32C					TITLE OF THE COURSE:MENTAL HEALTH AND SOCIAL WORK					HOURS:6	CREDITS:5
COURSE OUTCOMES (CO)	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)					MEAN SCORE OF CO'S	
	P O1	P O2	P O3	P O4	P O5	PS O1	PS O2	PS O3	PS O4	PS O5		
CO1	4	4	5	4	5	4	4	5	4	5	4.4	
CO2	4	4	4	5	4	4	5	4	4	4	4.2	
CO3	5	4	5	4	4	5	5	4	4	4	4.4	
CO4	4	4	4	3	4	5	5	4	4	4	4.1	
CO5	5	4	5	4	5	5	5	4	4	5	4.6	
<b>Mean Overall Score</b>											<b>4.34</b>	

**Result: The Score of this Course is 4.34(Very High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome.

## **UNIT I**

Mental Health: Meaning, Definition. History and Scope of Psychiatric Social Work; Changing Perspective of Psychiatric Social Work; Mental Health and Wellbeing in India. India view of Mental Health and Well Being. Attitudes and Beliefs Pertaining to Mental Illness in Ancient, Medieval and Modern Times.

## **UNIT II**

Stress and Coping: Stress and Mental Health Factors influencing Stress among Children, Adolescents, Women, Workers, Elderly and related to Physical Illness, Coping with Stress, Emotions and Crisis.

## **UNIT III**

Psychiatric Assessment and Intervention: History Taking and Mental Status Examination, Psycho Social and Multidimensional Assessment of Mental Disorders in Psychiatric Social work. Common Mental Disorders - Symptoms, Causes and Treatment of Neurosis, Psychosis, Psycho Physiological Disorders, Personality Disorders. 2017 Amendment of Mental Health Act 1987.

## **UNIT IV**

Neurotic and Psychotic Disorder: Anxiety, Phobia, Obsessive Compulsive Disorder, Posttraumatic Stress Disorder and Psycho Somatic Disorder. Alcoholism, Drug abuse and Suicide. Mental Retardation and Alzheimer's disease, sexual deviation, epilepsy, culture bound syndrome. Social Media Addiction. Psychological Identity.

## **UNIT V**

Childhood Disorders: Autism and Infantile Schizophrenia, Attention Deficit and Hyperactivity Disorder, Behaviour and Habit Disorder, Disorders associated with Eating, Speech and Sleep, Scholastic backwardness, Identity Crisis. National Mental Health Programmes.

## **TEXT BOOKS:**

1. Colin Pritchard, Mental Health Social Work.
2. Jacqueline Corcoran, Mental Health in Social Work: A Casebook on Diagnosis and Strengths Based Assessment (DSM 5 Update) with Pearson e Text -- Access Card Package,
3. K. Park, 2013, Park Text Book of Preventive and Social Medicine, M/S Banarsidas Bhanot Publishers.
4. Niraj Ahuja, 2011, A Text Book of Psychiatry, Jaypee Brothers Medical Publishers (pvt) Ltd.
5. Randy J. Larsen, David M. Buss, 2011, Personality Psychology, Tata McGraw – Hill Edition.



**REFERENCE BOOKS:**

1. Abelin, T. Brzenski and V.D. Car stairs. Measurement in Health Promotion and Protection. Copenhagen: WHO.
2. Bhugra, Gopinath, Vikram Patel, 2005 Handbook of Psychiatry- A South Asian Perspective. Byword Viva Publishers Pvt.Ltd., Mumbai
3. Francis, C. M. 1991. Promotion of Mental Health with Community Participation. Kerala: The Center for Health Care Research and Education.
4. Jay, Pee. 1994. Diagnostic and Statistical Manual of Mental Disorders (DSM IV). New Delhi: Oxford Press.
5. Kappur. M. Sheppard. Child Mental Health-Proceedings of the Indo-US symposium.
6. Mane P. & Gandevia K. 1994. Mental Health in India Issues and Concerns; Tata Institute of Social Sciences, Mumbai.
7. WHO, 2004 The ICD-10 Classification of Mental and Behavioral Disorders, Diagnostic Criteria for Research, AITBS Publishers and Distributors, Delhi
8. World Health Organization. Geneva. 1992. The ICD 10 Classification of Mental and Behavioral disorders, Clinical Description and Diagnostic Guidelines; Oxford University. Press

<b>II – M.S.W</b>	<b>HUMAN RIGHTS</b>	<b>ECHR901T</b>
<b>SEMESTER – III</b>		<b>HRS / WEEK : 2</b>
<b>INTERDISCIPLINARY</b>		<b>CREDIT : 1</b>

**OBJECTIVE:**

To get knowledge on human rights.

**COURSE OUTCOMES (COs):**

After completing this course, students will:

**CO1:** Gain Knowledge about Emergence of Human Rights.

**CO2:** Knowledge relating to various Declaration on Human Rights.

**CO3:** To know the various Covenants for protecting Human Rights.

**CO4:** To know the various Covenants for protecting Human Rights.

**CO5:** To Evaluate Certain issues on Human Rights.

**UNIT I**

Historical Development - Origin - Meaning – Nature – Scope and Classification of Human Rights – Theories of Human Rights.

**UNIT II**

Universal Declaration of Human Rights -1948- Geneva Convention of 1949 - International Human Rights in Domestic Court.

**UNIT III**

International Covenant on Civil and Political Rights 1966 – International Covenant on Economic, Social and Cultural Rights – International Covenant Supervision and Punishment of the Crime of Apartheid.

**UNIT IV**

Women’s Rights - Women Conference - CEDAW - Protection of Women from Domestic Violence Act - 2005 – Present Position of Women in India – Child Labour - Legislation to Protect Child Labour in India – Child Abuse – Problem of Refugees – Capital Punishment.

**UNIT V**

The Protection of Human Rights Act. 1993 – National Human Rights Commission – State Human Rights Commission – Minorities Rights Commission – National Commission for Women.

**TEXT BOOKS:**

1. Sharma, N.R., Human Rights in the World, Jaipur, 1999.

## **REFERENCE BOOKS:**

1. Adil-ul Yasin and Archana Upadhyay, Human Rights, New Delhi, Akansha Publishers, 2004.
2. AnuSaksena, Human Rights and Child Labour in Indian Industries, Delhi, Shipra Co-op Book Society, 1998.
3. RajindarSachar, Human Rights: Perspectives and Challenges, New Delhi, Gyan Publishing House, 2005.
4. Kaarthikeyan D.R., Human Rights: Problems and Solutions, New Delhi, Gyan Publishing, House, 2004.
5. Misha, R.C., Governance of Human Rights: Challenges in the Age of Globalization, Delhi, Publications, 1999.

## **QUESTION PAPER PATTERN**

**Max Marks** – 75 Time - 3 Hours

**Section – A** Choose the Correct Answer (10 x 1 = 10 Marks)

**Section – B** Answer any Five of the following (5 X 5 = 25 Marks)

**Section – C** Write an Essay on any Two of the following (2 x 20 = 40 Marks)

<b>II – M.S.W</b>	<b>COMPUTER APPLICATION IN SOCIAL WORK</b>	<b>19EPSW33A</b>
<b>SEMESTER – III</b>		<b>HOURS: 4</b>
<b>ELECTIVE – III (A)</b>		<b>CREDIT: 3</b>

**OBJECTIVE:**

To understand the basics of computer, its applications and SPSS in the field of Social Work research.

**COURSE OUTCOMES (COs)**

After completing this course, students will:

CO1: Be exposed to the fundamentals of computer.

CO2: Gain knowledge on office applications.

CO3: Understand the usage of SPSS in the field of Social Work research.

CO4: Be capable of creating data file and to develop practical knowledge.

CO5: Be aware of applications of Statistical Calculation.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

<b>SEMESTER III</b>	<b>COURSE CODE: 19EPSW33A</b>					<b>TITLE OF THE COURSE: COMPUTER APPLICATION IN SOCIAL WORK</b>					<b>HOURS:4</b>	<b>CREDITS:3</b>
<b>COURSE OUTCOMES (CO)</b>	<b>PROGRAMME OUTCOMES (PO)</b>					<b>PROGRAMME SPECIFIC OUTCOMES (PSO)</b>					<b>MEAN SCORE OF CO'S</b>	
	<b>P O1</b>	<b>P O2</b>	<b>P O3</b>	<b>P O4</b>	<b>P O5</b>	<b>PS O1</b>	<b>PS O2</b>	<b>PS O3</b>	<b>PS O4</b>	<b>PS O5</b>		
<b>CO1</b>	5	3	5	5	3	5	2	4	3	4	<b>3.9</b>	
<b>CO2</b>	5	3	5	5	3	5	2	5	3	4	<b>4</b>	
<b>CO3</b>	5	3	5	5	3	5	2	5	3	4	<b>4</b>	
<b>CO4</b>	5	3	5	5	3	5	2	4	3	4	<b>3.9</b>	
<b>CO5</b>	5	3	5	5	3	5	2	4	3	4	<b>3.9</b>	
	<b>Mean Overall Score</b>										<b>3.94</b>	

**Result: The Score of this Course is 3.94(High)**

<b>Association Scale</b>	<b>1%-20%</b>	<b>21%-40%</b>	<b>41%-60%</b>	<b>61%-80%</b>	<b>81%-100%</b>
<b>Interval</b>	<b>0&lt;=rating&lt;=1</b>	<b>1.1&lt;=rating&lt;=2</b>	<b>2.1&lt;=rating&lt;=3</b>	<b>3.1&lt;=rating&lt;=4</b>	<b>4.1&lt;=rating&lt;=5</b>
<b>Rating</b>	<b>Very Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>High</b>	<b>Very High</b>

This Course is having **HIGH** association with Programme Outcome and Programme Specific Outcome.

## **UNIT I**

Fundamentals of a Computer: Meaning, Characteristics, basic operations – input, storage, processing, output, ALU and control. Devices of a computer hard ware, software, types of software – application, system, utility. Meaning of programme. Computer language – machine, assembly high level. Assembler, interpreter and compiler, operating system.

## **UNIT II**

Office Applications: MS Office (MS Word, MS Excel or Spreadsheets, PowerPoint). Internet and browsing E-Mail, Use of Internet in Research. Practical – creating document, excel, power point and mail merge.

## **UNIT III**

Statistical Package for Social Sciences: Basics of Statistical analysis – population, sample, case, case number, variable, variable level, types of variable – numeric, string, alphanumeric, system missing value, user defined missing value, code book and code sheet, types of statistics, statistical tests, types of analysis. Structure of SPSS windows.

## **UNIT IV**

Creating data file, syntax file and output file: Defining data, Variable name, Variable label Values, value labels. Editing data file, adding cases, adding variables, saving files, retrieving data files, printing data file. Recoding of data. Practical – creating data file, syntax file, Output file, Recoding of Data. Exporting output file to Ms-Word.

## **UNIT V**

Analysis of data: Univariate and Bivariate Analysis, charts and diagrams. Editing of table and charts, exporting tables and charts in Word document. Interpretation of data, Application of Statistical Calculation and Test, Measurement of Central Tendency, Dispersion, ‘t’ test, Chi-square Test. Application of Correlation, Regression. ANOVA. Practical – Creating frequency table, Cross tables, Charts, Statistical tests – Chi square test, t test.

### **TEXT BOOKS:**

1. Alexis Leon, 2013, Computer Applications in Business, Vijay Nicole imprints Pvt Ltd.
2. Computer Literacy Programme (CLP), 2011. Vijay Nicole Imprints Private Ltd.
3. Saxena, Sanjay. 1999. A First Course in Computers. Vikas Publishing House Pvt. Ltd. New Delhi.
4. Sharma Vivek. 2014. UGC NET Tutor Social Work, Arihant Publications New Delhi.
5. V. Rajaraman, 2001, Fundamentals of Computers, Eastern Economy Edition.

### **REFERENCE BOOKS:**

1. Foster, J.J. 1998. Data Analysis Using SPSS for Windows. Sage Publications Ltd. London.
2. Kelle, V. 1998. Computer Aided Qualitative Data Analysis. Theory, Methods and Practice. Sage Publications Ltd. London.
3. Mansfield, Ron. 1997. The Compact Guide to Microsoft Office Professional. Sybex Computer Books Inc. USA.
4. Saxena, Sanjay. 1999. A First Course in Computers. Vikas Publishing House Pvt. Ltd. New Delhi.
5. Sundarajan, K. 1998. Internet. Kandadasan Pathippagam. Chennai.
6. Taxali, R.K. 1998. PC Software for Windows Made Simple. Tata MC Graw-Hill Publishing Company Ltd. New Delhi.

<b>YEAR – II</b>	<b>MANAGEMENT OF ORGANIZATIONS</b>	<b>CODE: 19EPSW33B</b>
<b>SEMESTER –III</b>		<b>HRS/WEEK : 4</b>
<b>ELECTIVE – III (B)</b>		<b>CREDITS: 3</b>

**OBJECTIVE:**

To understand the concept related to Management of Organizations at the different levels.

**Course Outcomes:**

After completing this course, students will:

**CO1:** Understand the concept of Fundamentals of Management.

**CO2:** Be exposed to the Evolution of Management Thought.

**CO3:** Understand Basics of Organization.

**CO4:** Learn the basic skills of management.

**CO5:** Gain the knowledge on empowering and personal skills.

<b>SEMESTER III</b>	<b>COURSE CODE: 19EPSW33B</b>					<b>TITLE OF THE PAPER: MANAGEMENT OF ORGANIZATIONS</b>					<b>HOURS:4</b>	<b>CREDITS:3</b>
<b>COURSE OUTCOMES (CO)</b>	<b>PROGRAMME OUTCOMES (PO)</b>					<b>PROGRAMME SPECIFIC OUTCOMES (PSO)</b>					<b>MEAN SCORE OF CO'S</b>	
	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO5</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO 5</b>		
<b>CO1</b>	5	4	4	4	4	4	3	4	4	4	4	
<b>CO2</b>	5	4	5	4	4	5	4	4	5	4	4.4	
<b>CO3</b>	5	4	5	4	5	5	4	4	4	4	4.4	
<b>CO4</b>	5	4	4	4	4	5	4	5	4	4	4.3	
<b>CO5</b>	5	4	5	5	4	5	3	4	4	4	4.3	
<b>Mean Overall Score</b>											<b>4.28</b>	

**Result: The Score of this Course is 4.28(Very High)**

<b>Association</b>	<b>1%-20%</b>	<b>21%-40%</b>	<b>41%-60%</b>	<b>61%-80%</b>	<b>81%-100%</b>
<b>Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Interval</b>	<b>0&lt;=rating&lt;=1</b>	<b>1.1&lt;=rating&lt;=2</b>	<b>2.1&lt;=rating&lt;=3</b>	<b>3.1&lt;=rating&lt;=4</b>	<b>4.1&lt;=rating&lt;=5</b>
<b>Rating</b>	<b>Very Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>High</b>	<b>Very High</b>

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome

## **UNIT -I**

Management: Definition, Nature, Functions (Planning, Organizing, Staffing, Directing, Leading, Controlling and Coordination). Levels of Management - Top, Middle and low level. 7Ms of management (Materials, Manpower, Machinery, Marketing, Mix, Motivations and Money). Managerial skills: Conceptual Technical and Human Re

## **UNIT-II**

Concepts and Key Contributions - Classical Theory: Administrative Management (Henri Fayol). Bureaucratic Theory (Max Weber). Neo Classical Theory: Human Relations Approach (Elton Mayo), Behavioural Approach (Chris Argris, Douglas McGregor, M P Follet, Abraham Maslow) New Management theory: System Approach (open/closed/synergy/entropy), Management Science Approach, Contingency Approach. HR Analytical. Knowledge Management.

## **UNIT III**

Organization: Concept, Elements of Organization. Organizational Objectives, Vision and Mission Organization Structure: Concept and Advantages and Disadvantages of Organization Structure by function, by product, by geographical market; network organizations and virtual organizations Business Organizations: Concept and Operational Areas (Production Management, Human resource Management, Marketing Management and Advertising Management, Materials Management. Management Information System (MIS). Employees engagement and Green HR.

## **UNIT IV**

Introduction to skills & personal skills Importance of competent managers, developing self-awareness on the issues of emotional intelligence, self-learning styles, values, attitude towards change, Training and Development. Team building & team work. Skill development and skill Application.

## **UNIT V**

Empowerment: Meaning of empowerment, dimensions of empowerment. Problem solving, creativity, innovation, conceptual blocks. Personal interview management. Building relationship Skills for developing positive interpersonal communication, supportive communication. Coaching and employees Counselling, defensiveness and disconfirmation.

## **TEXT BOOKS**

1. Samvel.C. Certo And S. Trevis Certo Modern Management Prentice Hall of India Pvt. Lad 2007
2. P. Subba Rao, Management and organization behavior (text and case) Himalaya publishing 2017
3. Principles of Management, S. P. Rajagopal Sin John R. Schermerhorn Jr. Wiley India Pvt Lad, New Delhi 2005.
4. Harold Koontz, Heinz Wellrich and Ramachandra Aryasie, "Principles of Management", Tata McGraw Hill Publishing Co Lad, New Delhi-2004
5. Prasad L.M., Organisational Behaviour, 4th edition, New Delhi, Sultan Chand and Sons Publisher, 2004

## **REFERENCE BOOKS**

1. John R. Schermerhorn Jr. Wiley India Pvt Ltd, New Delhi 2005. 5. Sherlekar S.A., Heredia R.A. et al, "Industrial Organization and Management", Himalaya Publishing House, Bombay, 1979,
2. Gupta C.B., "Organisation and Management" Sultan Chand & Sons, New Delhi, 1998.
7. Joseph L. Massie, "Essentials of Management", Prentice Hall of India Ltd, New Delhi, 1973.
3. Harold Koontz, Heinz Wellrich and Ramachandra Aryasir, "Principles of Management", Tata McGraw Hill Publishing Co Lad, New Delhi-2004
4. Robin Lall 2004 The Dynamics of NGO's New Delhi, Dominant Publishers.
5. Sooryamoorthy R and Gangrade K.D 2006 NGOs in India-A cross Sectional study New Delhi: Rawat.



I – M.S.W	FIELD WORK – III	PSWF3A
SEMESTER – III		HRS/WK : 12*
CORE PRACTICAL – III		CREDIT : 6

**OBJECTIVE:**

To get exposure in the field of professional settings based on the specialization.

**COURSE OUTCOMES (COs):**

After completing this course, students will:

**CO1:** Gain social workers professional knowledge on different settings.

**CO2:** Learn about human resource management.

**CO3:** Be exposed on role of medical social worker in hospital settings.

**CO4:** Understand the community problem.

**CO5:** Organize group work and community organization programme.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER III	COURSE CODE: PSWF3A					TITLE OF THE COURSE: FIELD WORK – III					HOURS :12	CREDITS: 6
COURSE OUTCOMES (CO)	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)					MEAN SCORE OF CO'S	
	P O1	P O2	P O3	P O4	P O5	PS O1	PS O2	PS O3	PS O4	PS O5		
CO1	5	4	5	3	5	5	4	3	5	5	4.4	
CO2	5	4	5	4	5	5	5	4	5	5	4.7	
CO3	5	4	5	4	5	5	5	4	5	5	4.7	
CO4	5	4	5	4	5	5	5	4	5	5	4.7	
CO5	5	3	5	4	5	5	5	4	5	5	4.6	
<b>Mean Overall Score</b>											<b>4.62</b>	

**Result: The Score of this Course is 4.62(Very High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome.

The second year students during the third semester go for practice based social work for two days in a week and expected to spend a minimum of 10 hours per week in the field. The students are placed in villages or hospitals or schools or NGOs or government offices or counselling centres or welfare organizations or service organization or industries according to their field of specialization for a semester.

During the placement they have to practice all the primary and secondary methods of social work in their respective fields of specialization. During the placement the students are expected to learn about the vision, mission, philosophy, administration, strategies, programmes, activities, achievements and also involve with the activities of the organization to whatever extent possible.

The students also undertake any assignments given to them by the agency, they may also undertake any research for the organization. The community organization programme is being organized by each student to promote extension activities towards different villages, institutions and organizations.

Every week the students write a report of their activities and submit to the concerned field work supervisor. The supervisor conducts individual and group conference every week regularly. At the end of the semester Viva- Voce is conducted by two examiners, one being an external examiner and the other would be the supervisor. 20 marks are being awarded by the internal faculty supervisor, 20 Marks are awarded by the Agency Supervisor and 60 marks are being awarded by the external examiner.

\* Number of hours spent for two days in a week by a student in the field.

## Marks Allotments

### Specialization - Community Development

S. No	Assigned Work	Internal	External
		Faculty	External Examiner
1	Organization Profile, Group Work, Community Organization Programme	40	
2	Presentation, Quality in Components, Communication		60
	<b>Total</b>	<b>100</b>	

### Specialization – Human Resource Management

S. No	Assigned Work	Internal	External
		Faculty	External Examiner
1	Organization Profile, Role of Human Resource Management Department, Community Organization Programme	40	
2	Presentation, Quality in Components, Communication		60
	<b>Total</b>	<b>100</b>	

### Specialization - Medical and Psychiatric

S. No	Assigned Work	Internal	External
		Faculty	External Examiner
1	Organization Profile, Case Work, Community Organization Programme	40	
2	Presentation, Quality in Components, Communication		60
	<b>Total</b>	<b>100</b>	

<b>II – M.S.W</b>	<b>NATIONAL SOCIAL WORK PERSPECTIVES – AN ACADEMIC VISIT</b>	<b>19PSWE2</b>
<b>SEMESTER – III</b>		<b>HRS: NIL</b>
<b>EXTENSION – II</b>		<b>CREDIT : 2</b>

National Social Work Perspectives – An Academic Visit is a part and parcel of the field work to training in social work education. The students are encouraged to make this visit outside the state. It is compulsory for final year students as a part of social work training. Students will be visiting various reputed organization at the national level related to their field of Specialization and understand the functioning of such successful organizations. The students need to prepare the report of the Academic Visit and present it during the Viva. Vice-voce examination is conducted internally for 100 marks. After the Internal Viva-voce, the students are awarded with 2 credits.

### OBJECTIVE:

To get national level exposure by visiting different atmosphere.

### COURSE OUTCOMES (COs):

After completing this course, students will:

**CO1:** Experience group dynamics.

**CO2:** Be exposed to the various socio-cultural patterns.

**CO3:** Understand the functioning of successful organizations.

**CO4:** Gain awareness on implementation and execution of tasks.

**CO5:** Be exposed to different atmosphere.

### Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes

SEMESTER III	COURSE CODE: 19PSWE2					TITLE OF THE COURSE: NATIONAL SOCIAL WORK PERSPECTIVES – AN ACADEMIC VISIT					HOURS : Nil	CREDITS:2
COURSE OUTCOMES (CO)	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)					MEAN SCORE OF CO'S	
	P O1	P O2	P O3	P O4	P O5	PS O1	PS O2	PS O3	PS O4	PS O5		
CO1	5	3	4	3	5	5	5	4	5	5	4.4	
CO2	4	3	4	3	4	4	4	3	3	4	3.6	
CO3	5	3	4	3	4	4	4	3	4	4	3.8	
CO4	5	5	5	5	5	5	4	4	5	5	4.8	
CO5	5	3	4	3	5	5	5	4	5	5	4.4	
<b>Mean Overall Score</b>											<b>4.2</b>	

**Result: The Score of this Course is 4.2(Very High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome.

**Academic Visit Process**

The students are involved in the entire planning of the Academic Visit- beginning from the selection of the places for visit, getting prior permission, drafting the schedule for the entire visits & arranging for travel and accommodation. Two faculties would be in charge for the Visit. They would be guiding the students in the whole process of planning and execution and also accompanying them for the visits.

**Tasks to be carried out**

1. Actively take part in the process of planning for the Academic Visit.
2. Formation of committees, allocation and execution of concerned responsibilities.
3. Respecting individuality and accommodating oneself for the cause of the group.
4. Implementing the suggestions and guidance of the Faculty.

**Skills to be acquired**

Skills in Planning, Organizing, Execution, Group Living, collateral contacting, Rapport Building, Budgeting, Accounting, Time Management, Leadership etc.

**Marks Allotments**

CIA – 40

Semester Viva voce - 60

## SPECIALISATION PAPER III

### COMMUNITY DEVELOPMENT SPECIALISATION

II – M.S.W	PROJECT MANAGEMENT	19PSW41A
SEMESTER – IV		HOURS : 6
CORE – X		CREDIT : 5

**OBJECTIVE:**

To understand the concept of project and project identification and implementation.

**COURSE OUTCOMES (COs)**

After completing this course, students will:

**CO1:** Learn the concept of project cycle management.

**CO2:** Understand the project identification and implementation.

**CO3:** Be aware of project design.

**CO4:** Understand the CSR.

**CO5:** Determine the role of central and state governments in advocacy.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER IV	COURSE CODE: 19PSW41A					TITLE OF THE COURSE: PROJECT MANAGEMENT					HOURS: 6	CREDITS: 5
COURSE OUTCOMES (CO)	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)					MEAN SCORE OF CO'S	
	P O1	P O2	P O3	P O4	P O5	PS O1	PS O2	PS O3	PS O4	PS O5		
CO1	5	3	5	3	4	5	4	5	4	4	4.2	
CO2	5	3	5	3	5	5	4	5	4	5	4.4	
CO3	5	3	5	3	5	5	4	5	4	5	4.4	
CO4	5	4	5	3	5	5	4	4	4	5	4.4	
CO5	5	3	5	3	4	5	4	4	4	4	4.1	
<b>Mean Overall Score</b>											<b>4.3</b>	

**Result: The Score of this Course is 4.3(Very High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome.

## **UNIT I**

Planning: Meaning, Process, Reasons, Usefulness, Types, Barriers, Importance. Development Cycle in Planning – Existing Development Cycle and Desired Development cycle. Project Cycle – Meaning, Phases – Identification, Design, Implementation, Evaluation. Project Cycle Management – Meaning and the Importance. Concept Note – Meaning, Outline.

## **UNIT II**

Project Identification – Need Assessment, Tools for Need Assessment – Listening, Interviewing, Focus Groups, Community Mapping, Priority Fixing. Capacity Assessment – Meaning, Types of Assets in Capacity Assessment. Assets and Capacity. Appreciative Inquiry – Discover, Dream, Design and Deliver.

## **UNIT III**

Project design – Meaning. Process of Project Designing – Stakeholder Analysis, Research including Problem Analysis, Log Frame, Risk Analysis, Action Planning, Budgeting. Implementation – Meaning, Phases, Factors Affecting the Implementation. Monitoring Reviewing and Evaluation – Meaning, Purposes, Differences, Indicators, Reporting

## **UNIT IV**

Corporate Social Responsibility – Meaning, Importance, Theory and Models of CSR. Social Auditing – Meaning, Uses, Principles, Stages – Social Book Keeping, Social Accounting and Social Auditing. Methodology and Process of Social Auditing.

## **UNIT V**

Advocacy: Meaning, Approach, Role and Practice; National & International Funding Agencies; State and Central Government Projects; Project Proposal Writing.

**TEXT BOOKS:**

1. Blackman, Rachel. 2003. Project Cycle Management. UK: Tearfund.
2. Clifford. Gray Erik W. and Larson Gautam. V. Dasai. 2013. Project Management IV Edition. McGraw Hill Education India Pvt. Ltd. New Delhi.
3. Gopala Krishnan. P, V.E Ramamoorthy, 2014, Text Book of Project Cycle Management, Trinity Publications.
4. Harwey Maylor, 2012, Project Cycle Management 3<sup>rd</sup> Edition, Dorling Kindersley Private Limited Noida.
5. Thomas Ericson, 2015, Project Management 2<sup>nd</sup> Edition, Global Academic Publishers and Distributors, New Delhi.

**REFERENCE BOOKS:**

1. Crooks, Bill. 2003. Capacity Self Assessment. UK: Tearfund.
2. Desai, Vasanth. 1988. Rural Development. Vol. I to VI. Bombay: Himalaya Publishing House.
3. Gordon, Graham. 2002. Practical Action in Advocacy. UK: Tear fund
4. Kadekodi, G.K. and K. Chopra. 1999. Operationalizing Sustainable Development New Delhi: Sage Publications. India Pvt. Ltd.
5. Pareek, Udai. 1982. Education and Rural Development in Asia. Oxford and IBH Publications. New Delhi.
6. Vasanth Desai, Project Management, Himalaya Publishing House, Private Limited, Mumbai.



## SPECIALISATION PAPER – III

### HUMAN RESOURCE MANAGEMENT SPECIALISATION

II – M.S.W	<b>ORGANIZATIONAL BEHAVIOUR</b>	<b>19PSW41B</b>
SEMESTER – IV		<b>HOURS : 6</b>
CORE – X		<b>CREDIT : 5</b>

**OBJECTIVE:**

To be exposed to organization and personal behaviour.

**COURSE OUTCOMES (COs)**

After completing this course, students will:

**CO1:** Understand the concept of organizational behaviour.

**CO2:** Learn the process of organizational development.

**CO3:** Be exposed to organization and personal behaviour.

**CO4:** Understand the group behavior at work place.

**CO5:** Be aware of role of behavioral scientist in industry.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER IV	COURSE CODE: 19PSW41B					TITLE OF THE COURSE: ORGANIZATIONAL BEHAVIOUR					HOURS :6	CREDITS:5
COURSE OUTCOMES (CO)	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)					MEAN SCORE OF CO'S	
	P01	P02	P03	P04	P05	PS01	PS02	PS03	PS04	PS05		
CO1	5	4	5	4	5	5	5	4	5	5	4.7	
CO2	5	4	5	4	3	5	5	3	5	5	4.4	
CO3	5	4	5	3	5	5	5	4	5	5	4.6	
CO4	5	4	5	4	5	5	5	4	5	5	4.7	
CO5	5	4	5	4	5	5	5	4	5	5	4.7	
<b>Mean Overall Score</b>											<b>4.62</b>	

**Result: The Score of this Course is 4.62(Very High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome.

## **UNIT I**

Organizational Behaviour: Brief History, Definition, Characteristics and Models. Contributions of the Behavioral Sciences. Human Behaviour at Work: Theories of Motivation – Motivating Human – Systems Theory, Emotional quotient at Work. Emerging perspectives on Organizational Behavior – Dimensions of Organizational Behavior.

## **UNIT II**

Inter-Personal and Intra-Personal behavior: Physical and intellectual ability, Emotional Intelligence, Attitude, Job Satisfaction, Job Involvement and organizational commitment, Personality, Perception, Assertiveness, Learning: Process and Theories, Transactional Analysis, Johari window. Motivation: Concept, theories and Techniques. Morale: Meaning and importance, Factors, Measures and techniques of promoting positive morale.

## **UNIT III**

Foundation of Group Behaviour at Workplace: Concept, Types of Groups, Group Structure, Group Dynamics: Decision Making, Team work, Communication, Leadership - Meaning, Roles, Skills, Styles, Theories, Types of Leadership, Power and Politics - Quality of work life – Work Life Balance – Employee Empowerment and Employee Engagement.

## **UNIT IV**

Organizational Conflict: Concepts, causes and types – Conflict resolution strategies. Organizational change: Concept, forces of change and resistance to change, Managing organizational change and diversity. Organizational Culture and Climate. Organizational Development: Concept, Definition, theories and practice: Organizational Development and Organizational Behaviour, OD Intervention techniques: Sensitivity Training. Quality Circles. Survey Feedback, Management of change. Individual behaviour, Foundations of individual behaviour.

## **UNIT V**

Organizational Dynamics: Stress and Burn Out: Concepts, Causes, Consequences - Coping mechanism and strategies. Gender Sensitivity. Dysfunctional Behaviours: Absenteeism, Alcoholism, Fatigue, Monotony, Accidents and Boredom; Role of Behavioural Scientist in Industry. Employee Coaching and Mentoring. Employee Counselling: Concept, objectives, need, functions, techniques and advantages.

## **TEXT BOOKS:**

1. Aswathappa K. 2012. Organizational behaviour. Himalaya Publication house. Mumbai.
2. Dr. S. S. Khanka. Organizational Behaviour, S. Chand Company Pvt, Ltd 2008.
3. Fred Luthans. Organizational Behaviour, Mc Graw Hill International Edition 2011.
4. John W. Newstorm. 2007. Organizational Behaviour Human Behaviour at Work, Tata Mc Graw Hill.
5. P. Subha Rao. Personnel and Human Resource Management, Himalaya Publishing House, 2016.

**REFERENCE BOOKS:**

1. Fred Luthans. Organizational Behaviour, Mc Graw Hill International Edition, 2002.
2. Hellriegel Don and Slocum John W., Jr, 2004 Organizational Behaviour, New Delhi, Thomson South-Western.
3. Khanka, S S., 2008 Organizational Behaviour, New Delhi, S.Chand and Co., Ltd.
4. Kumar Arun and Meenakshi N, 2009 Organizational Behaviour- A Modern Approach, NIILM Center for Management Studies, New Delhi.
5. Nalini. R. 2011. Social work and the workplace. New Delhi: Concept Publications
6. Nelson, Debra L and James Compbell, 2007 Organizational Behaviour- Foundations, Realities and Challenges, New Delhi, Thomson South-Western.
7. Paul Hersey Kenneth H. Blanchard, Dewey E. Johnson. Management of Organizational Behaviour Utilizing Human Resource, Prentice Hall of India Pvt Ltd, 2001.
8. Robbins Stephen. P. et al. 2012. Organizational behaviour. New Delhi. Pearson publications.

## SPECIALISATION PAPER – III

### MEDICAL AND PSYCHIATRY SPECIALIZATION

II – M.S.W	<b>PSYCHIATRIC SOCIAL WORK</b>	<b>PSW41C</b>
SEMESTER – IV		<b>HRS/WK: 6</b>
CORE– X		<b>CREDIT: 5</b>

**OBJECTIVE:**

To be exposed equipped with clinical setting and methods of psychological treatments.

**COURSE OUTCOMES (COs)**

After completing this course, students will:

**CO1:** Learn the psychiatric social work.

**CO2:** Be equipped with clinical setting.

**CO3:** Be exposed to methods of psychological treatments.

**CO4:** Understand the children mentality.

**CO5:** Be aware of the role of social worker in rehabilitation Centre.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER IV	COURSE CODE: PSW41C					TITLE OF THE COURSE: PSYCHIATRIC SOCIAL WORK					HOUR S:6	CREDITS:5
COURSE OUTCOMES (CO)	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)					MEAN SCORE OF CO'S	
	P O1	P O2	P O3	P O4	P O5	PS O1	PS O2	PS O3	PS O4	PS O5		
CO1	5	4	5	4	5	5	5	4	4	4	4.5	
CO2	5	4	5	4	5	5	4	4	4	4	4.4	
CO3	5	4	5	5	5	5	4	5	4	4	4.6	
CO4	4	5	4	5	4	5	4	5	4	4	4.3	
CO5	5	4	4	5	4	5	4	5	4	4	4.4	
<b>Mean Overall Score</b>											<b>4.44</b>	

**Result: The Score of this Course is 4.44(Very High)**

Association Scale	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome.

## **UNIT I**

Psychiatric Social Work: Concept, Definition, Limitations and difficulties faced in psychiatric social work practice, Magnitude of Mental Health Problems; Analysis of mental health problems among vulnerable groups such as women, aged, socio-economically disadvantaged, urban and rural population and disaster victims in India. Scope of Social Work in Mental Health.

## **UNIT II**

Present Practice and equipment of Psychiatric Social Work in various Clinical Setting. Mental health institutions, Government and Private Hospital and Psychiatric Clinic, Half way homes, Day care Centres, Sheltered Workshops, Department of Preventive and Social Medicine.

## **UNIT III**

Psychiatric Social Work Practices: Psychoanalytical, Psycho-Social, Transactional analysis, Life span approach, Family Centered Treatment, Tasks Centered, Therapeutic Intervention in Psychiatric illness: Psycho Surgery, Occupational therapy, Cognitive Behavior Modification therapy, Play therapy, Music therapy.

## **UNIT IV**

Child Mental Health and Social Work practice; development and psychological perspectives in child mental health; social work practice in child guidance clinic; Prevention and treatment intervention in family, school, neighbourhood and community settings. Psychiatric Social Work Practice in Crisis intervention centers and with special groups such as rape victims and HIV or AIDS patients.

## **UNIT V**

Psychological Rehabilitation: Concept, Principles, Process and Programmes; Role of Social Workers. Mental health policies and legislation in India; national mental health programmes. Research – Single Case Evaluation; Qualitative and Action research on mental health issues; monitoring and evaluation of programmes; Mental Health Care Models: TTK, SCARF, NIMHANS and BANYAN. Role and Functions of Psychiatric Social Worker

**TEXT BOOKS:**

1. Dr. R.N. Sharma, 2010, Abnormal Psychology, Subject Publication.
2. Niraj Ahuja, 2011, A Text Book of Psychiatry, Jaypee Brothers Medical Publishers (pvt) Ltd.
3. Randy J. Larsen, David M. Buss, 2011, Personality Psychology, Tata McGraw – Hill Edition.
4. Robert L. Solso, 2001, Cognitive Psychology, Delhi: Pearson Education.
5. Verma, Ratna, 1991 Psychiatric Social Work in India, Sage Publications, New Delhi
6. Patricia Casey, Brenden Kelly Fish's Clinical Psychopathology, third edition
7. Niraj Ahuja A Short Textbook of Psychiatry. Seventh edition.

**REFERENCE BOOKS:**

1. Daver, Bhargavi, 2001 Mental Health from a Gender Perspective, Sage Publications, New Delhi
2. Dhanda, Amita, 1999 Legal Order and Mental Disorder, Sage Publications, New Delhi
3. Ian Mathews(2000) Social Work and Spirituality, Learning Matters Ltd. Exeter, UK
4. Kapur, Malavika, 1997 Mental Health in Indian Schools, Sage Publications, New Delhi
5. Patricia Casey, Brendan Kelly Fish's Clinical Psychopathology, third Edition Niraj Ahuja A Short Textbook of Psychiatry. Seventh Edition.
6. WHO, 1991 Innovative Approaches in Mental Health Care, Psychosocial Interventions and Co-management, Geneva.

## SPECIALISATION PAPER – IV

### COMMUNITY DEVELOPMENT SPECIALIZATION

II – M.S.W	COMMUNITY DEVELOPMENT MANAGEMENT	19PSW42A
SEMESTER – IV		HRS/WK : 6
CORE– XI		CREDIT : 5

#### OBJECTIVE:

To learn the strategies to develop the community.

#### COURSE OUTCOMES (COs)

After completing this course, students will:

**CO1:** Understand the concept of NGO.

**CO2:** Learn the strategies to develop the community.

**CO3:** Be exposed to self-help groups and panchayat system.

**CO4:** Understand about the structure of NGOs and their management aspects.

**CO5:** Be aware of entrepreneurship Training and Development of Entrepreneurs.

#### Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes

SEMESTER IV	COURSE CODE: 19PSW42A					TITLE OF THE COURSE: COMMUNITY DEVELOPMENT MANAGEMENT					HOURS:6	CREDITS:5
COURSE OUTCOMES (CO)	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)					MEAN SCORE OF CO'S	
	P O1	P O2	P O3	P O4	P O5	PS O1	PS O2	PS O3	PS O4	PS O5		
CO1	5	3	5	3	4	5	5	5	4	4	4.3	
CO2	5	3	5	3	5	5	5	5	4	5	4.5	
CO3	5	4	5	3	5	5	5	5	4	5	4.6	
CO4	5	3	5	3	5	5	5	4	4	5	4.4	
CO5	5	3	5	3	4	5	5	4	4	4	4.2	
<b>Mean Overall Score</b>											4.4	

**Result: The Score of this Course is 4.4(Very High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome.

## **UNIT I**

Introduction to NGO: Concept and Characteristics, Types of NGOs – Classification; Role of NGOs in National Development; History of NGO Sector in India and World. Registration of NGO under Tamil Nadu Societies Registration Act 1975. Tax Regulations concerning NGOs: Specific Tax Exemptions (Section 12A, Section 35AC, Section 80G & 80GG of Income Tax Act. Foreign Contributions: Legal Regulations (Foreign Contribution Regulations Act)

## **UNIT II**

Government Schemes for the NGO Sector: Grant – in Aid schemes and other concessions of the Government of India and Tamil Nadu State Government; Schemes for the Welfare of the Children, Youth, Women, Aged and Differently Abled. International Agencies and NGOs: UN and its Agencies, World Bank, Asian Development Bank and other International Donor Agencies, Networking and Partnership with Government and other agencies.

## **UNIT III**

Self Help Groups & Federation of SHGS at the Panchayats, Cluster, Block and District. Role of state, banks in SHGs. Maintenance of records in SHGs. Grading and Evaluation of SHGs. Role of SHGs in local Issue Tackling. Leadership in SHGs. Problems faced by SHGs. SHGs and Economic development. Role of NGOs in SHGs. Role of social workers in SHGs. Micro Finance- Meaning and Characteristics- Working of Micro Finance- Philosophy of Micro Finance- Role of Social Worker in Micro Finance.

## **UNIT IV**

Water shed Management – Meaning, Objectives, and Implementation. Economic Benefits, Social Benefits. Role of NGOs in Water Shed Management. Role of Social Workers in Water Shed Management. Waste Land Development – Meaning and Characteristics. Identification of Waste Land, Role of NGOs in Waste Land Development. Community Based Organizations for Sustainable Development – Meaning, Characteristics- Community Participation

## **UNIT V**

Entrepreneurship – Meaning, Characteristics. Problems of Entrepreneurship. Women Entrepreneurs, Rural Entrepreneur. Personality and Dynamics of Entrepreneurs. Training and Development of Entrepreneurs. Role of TN Small Industries Development Corporation (SIDCO), National Bank for Agriculture and Rural Development (NABARD) and Khadi and Village Industries Commission (KVIC) in Entrepreneur development. Role of Social Workers in Entrepreneur development.

## **TEXT BOOKS:**

1. Asha Ramagonda Patil, 2013, Community Organization and Development an Indian Perspective, Eastern Economy Edition,
2. Jayashree. 2005. Entrepreneurial Development. Chennai: Marghan.
3. Suresh Chandra Annie Karen. 2015. Non-Governmental Organizations Origin and Development, Rawat Publications. Jaipur.
4. Samuel H Taylor, 2013, Theory and Practice of Community Social Work, New Delhi.
5. W. Sheafor Charles J. Horejsi, 2011, Techniques and Guidance for Social Work Practice, Ninth Edition, Bradford Eastern Economy Edition.



**REFERENCE BOOKS:**

1. Daniel A.V. 2011. Strategies for Agricultural Development Bombay: Vora.
2. Daniel, Lazer. 2008. Micro Training Poverty and Eradication. New Delhi: New Century Book House.
3. Desai Vasant. 2004: Dynamics of Entrepreneurial Development. New Delhi: Sultan anand & sons.
4. Giriappa. S. 2011. Water the Efficiency in Agriculture. Calcutta: Oxford Press.
5. Gupta C.B. 2004: Entrepreneurial Development. New Delhi: Sultan Anand& Sons.
6. Sharma, R. K. 2011. Entrepreneurship Development. Bombay: Himalaya Publishing House
7. Upendra, Nath Roy. 2005. People Participation in Watershed Management. New Delhi: Kanishka Publisher.
8. Usharani, K. 2008. Marketing Strategies, Finance Viability of Self Help Group. New Delhi: Sarop & Sons.

## SPECIALISATION PAPER – IV

### HUMAN RESOURCE MANAGEMENT SPECIALIZATION

II – M.S.W	INDUSTRIAL RELATONS	PSW42B
SEMESTER – IV		HRS/WK : 6
CORE– XI		CREDIT : 5

**OBJECTIVE:**

To understand the relationship between the industries and employer & employee.

**COURSE OUTCOMES (COs)**

After completing this course, students will:

**CO1:** Understand the concept of industrial relation.

**CO2:** Understand the relationship between the industries.

**CO3:** Be exposed trade union and bargaining system.

**CO4:** Understand the industrial disputes.

**CO5:** Gain knowledge on industrial legislations.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER IV	COURSE CODE: PSW42B					TITLE OF THE COURSE: INDUSTRIAL RELATONS					HOURS :6	CREDITS:5
COURSE OUTCOMES (CO)	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)					MEAN SCORE OF CO'S	
	P01	P02	P03	P04	P05	PS01	PS02	PS03	PS04	PS05		
CO1	5	4	5	4	5	5	4	3	5	5	4.5	
CO2	5	4	5	4	5	5	5	3	4	5	4.5	
CO3	5	4	5	4	5	5	4	3	5	5	4.5	
CO4	5	4	5	4	5	5	5	3	4	5	4.5	
CO5	4	5	4	3	5	5	4	4	4	4	4.2	
<b>Mean Overall Score</b>											<b>4.44</b>	

**Result: The Score of this Course is 4.44(Very High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome

## UNIT I

Industrial Relations: Meaning, Definition, Scope, Need and Factors Influencing IR Evolution of IR- Characteristics and Participants of IR. Approaches to IR-Maxian, Giri, Webbs, Dunlop. Influence of Socio-Economic, Political and Technical Forces on Industrial Relations; IR at Shop Floor and Plant. International Labour Organization: History - Aims and Objectives - Structure - Functions. Influence of ILO on Indian Industrial Relations - Labour welfare practices in India.

## UNIT II

Trade Unions: Meaning, General features- Principles of Union- Major trade unions in India-Problems and Weakness of trade union- Measures to Strengthening the Functioning of trade union. Trade Union: Origin and Growth of trade union movement in India - Theories - Functions - Administration of Unions - Leadership - Membership and Finance - management relations: Impact of Liberalization, Privatization and Globalization.

## UNIT III

Collective Bargaining: Main Features –Importance- Contents and Coverage of Collective Bargaining: Concept, Goals, Principles, Prerequisites. Bargaining Strategies - The factors influencing Collective bargaining - Skills of an effective bargaining agent. Workers Participation in Management: Concept - Aims and objectives - Scope - Levels of Participation, Forms of Participation in India- Conditions essential for working of the Scheme of workers' participation in Management.

## UNIT IV

Industrial Dispute: Meaning, Concept, Instruments of Coercion – Strike, Picketing, Bandh, Strikes and Lock – Out; Dispute Settlement Mechanisms: Bipartite Approach – Negotiation, Mediation, Works Committee, Significance of Employers' Federations; Tripartite Approach - Conciliation, Arbitration, Adjudication - Court of Enquiry, Labour Courts, Industrial Tribunal, National Tribunal, Awards; industrial democracy – Workers Participation.

## UNIT V

Industrial Relations Legislation: Indian Trade Union Act 1926, Industrial Disputes Act 1947, Industrial Employment (Standing Orders) Act 1946, The Industrial Relation Code – 2019. Emerging Trends in Union - Employee Discipline, Domestic enquiry proceedings, Grievance Redressal Machinery, Case Studies on Industrial Dispute.

### **TEXT BOOKS:**

1. B. Nandhakumar, Vijay Nicole, 2015, Industrial Relations Labour Welfare and Labour Laws, Imprints Private Limited, Chennai.
2. M. Sivakumar, 2011, Industrial Relations and Labour Welfare, Lakshmi Publications, Chennai.
3. P. R. N. Sinha, InduBala Sinha, Seema Priyadarshini Shekhar, 2020, Industrial Relations, Trade Unions and Labour Registration, Pearson.
4. S C Srinivastava, 2007, Industrial Relations and Labour Laws, Vikas Publishing House Private Limited, New Delhi.
5. Yoder, Dale. 1976. Personnel Management and Industrial Relations. New Delhi: Prentice Hall of India Pvt. Ltd.

**REFERENCE BOOKS:**

1. Johnson, T. L. 1981. Introduction to Industrial Relations. Britain: MacDonald & Eneer. Great
2. Mamkootam. Kuriakose. 1982. Trade Unions. Myth and reality. New Delhi: Oxford University press.
3. Mamoria, C. B. and Mamoria Satish. 1984. Industrial Labour. Social Security and Industrial peace in India. Allahabad: Kitab Mahal.
4. Punekar, S. D. et. al. 1981. Labour welfare. Trade Unions and Industrial Relations. Bombay: Himalaya Publishing House.
5. Ramassamy. E. A. and Uma Ramasamy. 1981. Industry and Labour An introduction. New Delhi: Oxford University Press.
6. White, K. Head. 1977. Industrial Relations. London: Hodder & Sought.
7. Yoder, Dale and Paul, D. Stanbhas, 1985. Personnel Management and Industrial Relations. New Delhi: Prentice Hall of India Pvt. Ltd.

## SPECIALISATION PAPER – IV

### MEDICAL AND PSYCHIATRY SPECIALIZATION

II – M.S.W	COMMUNITY HEALTH	PSW42C
SEMESTER – IV		HRS/WK : 6
CORE– XI		CREDIT : 5

#### OBJECTIVE:

To understand the concept of community health and occupational health diseases.

#### COURSE OUTCOMES (COs)

After completing this course, students will:

**CO1:** Gain knowledge on health and hygiene.

**CO2:** Enlighten with occupational health disease.

**CO3:** Be exposed to health care delivery system.

**CO4:** Be aware on health education.

**CO5:** Understand the community health and its work process.

#### Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes

SEMESTER II	COURSE CODE: PSW42C					TITLE OF THE COURSE: COMMUNITY HEALTH					HOURS:6	CREDITS:5
COURSE OUTCOMES (CO)	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)					MEAN SCORE OF CO'S	
	P O1	P O2	P O3	P O4	P O5	PS O1	PS O2	PS O3	PS O4	PS O5		
CO1	5	4	4	4	5	5	5	4	4	4	4.4	
CO2	4	4	5	4	4	5	5	4	5	4	4.4	
CO3	4	4	5	4	5	5	4	4	4	4	4.3	
CO4	4	4	4	4	4	5	4	4	4	4	4.1	
CO5	5	4	5	4	5	5	4	5	4	5	4.6	
<b>Mean Overall Score</b>											<b>4.36</b>	

**Result: The Score of this Course is 4.36(Very High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	$0 \leq \text{rating} < 1$	$1.1 \leq \text{rating} < 2$	$2.1 \leq \text{rating} < 3$	$3.1 \leq \text{rating} < 4$	$4.1 \leq \text{rating} < 5$
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome.

## **UNIT I**

Concept of Health: Meaning, Definition, Historical Development, Factors Influencing Health-Social and Preventive medicine. Organization and Administration of Health Care at the Center, State, District, Municipality and Village Level; Health Planning in India; Health Committees; Five Year Plan in Relation to Health Care. Emerging need for Palliative & Geriatric Care.

## **UNIT II**

Community Health Care - Changing Concepts; Primary Health Care for All; Health Status and Health Problems; Health Care Systems - Primary Health Centre; Private Health Systems Indigenous Systems; Voluntary Health Systems; Role of Social Worker in Community Health.

## **UNIT III**

Health Legislation; ESI Act 1948 and its amendment 1975, Medical Termination of Pregnancy Act 1971. Doctors Patients and the Consumer Protection act 1986, Reproductive health Act, Narcotic Drugs and Psychotropic substances Act 1985, Prenatal Diagnosis Technique (Regulation and Prevention of Misuse) Act, 1994.

## **UNIT IV**

Community Health care needs Assessment: Assessing Community Health needs - Moralizing core groups and Community Participation- Training of multipurpose health workers in community health Programs. Health Policies, Health Care Programmes in India: State and Central Insurance Scheme, Rashtriya Arogya Nithya, National Health Policy 1983, Population Problems and control.

## **UNIT V**

Health Programmes at the National level: National control of blind program, welfare program for physically challenged, national health Programmes: family welfare, maternal and child health, ICDS, Schools health programme, UIP, NMEP, NLEP, Diarrhea Disease control program.

### **TEXT BOOKS:**

1. Govt. of India (2002): National Health Policy, New Delhi, Ministry of Health and Family Welfare, New Delhi.
2. James F. McKenzie, Robert R. Pinger, Denise M. Seabert An Introduction to Community and Public Health.
3. James F. McKenzie, Robert R. Pinger, Jerome E. Kotecki, An Introduction to Community Health.
4. K. Park, 2013, Park Text Book of Preventive and Social Medicine, M/S Banarsidas Bhanot Publishers.
5. Pondicherry Aids Control Society, 2007. Pregnancy, Byword books Private Limited.

**REFERENCE BOOKS:**

1. Jim Yong Kim et al (2000): Dying for Growth: Global Inequality and the Health of the Poor, Cambridge, Common Courage Press. Chapters 2&3.
2. Levant, Ronald F. 1984. Family Therapy. New Delhi: Prentice Hall of India Pvt. Ltd.
3. Mackintosh, M and M.Koivusalo (Ed.) (2005): Commercialization of Health Care: Global and Local Dynamics and Policy Responses, New York, UNRISD and Palgrave-Macmillan.
4. Mane P. and Gandevia K. 1992. Mental Health in India, Issues and Concerns. Bombay: Tata Institute of Social Sciences.
5. World Health Organization 1990. Schizophrenia Information for Families – A Manual prepared by the World Schizophrenia Fellowship for Publication in Cooperation with the WHO.
6. World Health Organization 1992. Innovative Approaches in Mental Health Care. Psycho Social Interventions and Case Management. Geneva: WHO.

II – M.S.W	FIELD WORK – IV	PSWF4A
SEMESTER – IV		HOURS/ WEEK : 12 *
CORE PRACTICAL – IV		CREDIT : 6

**OBJECTIVE:**

To gain practical knowledge in different settings.

**COURSE OUTCOMES (COs)**

After completing this course, students will:

**CO1:** Be applicable of practical knowledge in different settings.

**CO2:** Learn the role of HR manager in industries.

**CO3:** Learn the role of social worker in NGO settings.

**CO4:** Understand the role of medical social worker.

**CO5:** Be aware of organizing programme.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER IV	COURSE CODE: PSWF4A					TITLE OF THE COURSE: FIELD WORK – IV					HOURS :12	CREDITS:6
COURSE OUTCOMES (CO)	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)					MEAN SCORE OF CO'S	
	P O1	P O2	P O3	P O4	P O5	PS O1	PS O2	PS O3	PS O4	PS O5		
CO1	5	4	5	3	5	5	4	3	5	5	4.4	
CO2	5	4	5	4	5	5	5	4	5	5	4.7	
CO3	5	4	5	4	5	5	5	4	5	5	4.7	
CO4	5	4	5	4	5	5	5	4	5	5	4.7	
CO5	5	3	5	4	5	5	5	4	5	5	4.6	
Mean Overall Score											4.62	

**Result: The Score of this Course is 4.62(Very High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome.



In the final semester the students go for practice based social work for two days in a week and expected to spend a minimum of 10 hours per week in the field.

The students are placed in villages or hospitals or schools or NGOs or government offices or Counselling centers or welfare organizations or service organization or industries according to the fields of specialization for a semester where MSW supervisor is available.

During the placement the students are expected involve with the activities of the organization to whatever extent possible.

The students make effort to get exposure and experience to relate the theoretical knowledge what they have gained in the class room and try to practice them. The students also undertake any assignments given to them by the agency; they may also undertake any research for the organization. The community organization programme is being organized by each student to promote extension activities towards different villages, institutions and organizations.

Every week the students write a report of their activities and submit to the concerned field work supervisor. The supervisor conducts individual and group conference every week regularly. At the end of the semester Viva- Voce is conducted by two examiners. 20 marks are being awarded by the internal faculty supervisor, 20 Marks are awarded by the Agency Supervisor and 60 marks are being awarded by the external examiner.

\* Number of hours spent for two days in a week by a student in the field.

## Marks Allotments

### Specialization - Community Development

S. No	Assigned Work	Internal	External
		Faculty	External Examiner
1	Organization Profile, Group Work, Community Organization Programme	40	
2	Presentation, Quality in Components, Communication		60
	Total	100	

### Specialization – Human Resource Management

S. No	Assigned Work	Internal	External
		Faculty	External Examiner
1	Organization Profile, Role of Human Resource Management Department, Community Organization Programme	40	
2	Presentation, Quality in Components, Communication		60
	Total	100	

### Specialization - Medical and Psychiatric

<b>S. No</b>	<b>Assigned Work</b>	<b>Internal</b>	<b>External</b>
		<b>Faculty</b>	<b>External Examiner</b>
1	Organization Profile, Case Work, Community Organization Programme	40	
2	Presentation, Quality in Components, Communication		60
	Total	100	

<b>II – M.S.W</b>	<b>RESEARCH PROJECT</b>	<b>JPSW1016</b>
<b>SEMESTER – IV</b>		<b>HRS/WK : 6</b>
<b>CORE PROJECT</b>		<b>CREDIT : 6</b>

**OBJECTIVE:**

To understand the importance of research, factors in collecting reviews for the research projects.

**COURSE OUTCOMES (COs)**

After completing this course, students will:

**CO1:** Understand the importance of research.

**CO2:** Determine the factors in collecting reviews for the research projects.

**CO3:** Be aware of writing research proposal

**CO4:** Determine the findings for chosen topic.

**CO5:** Finds suggestion and conclusion for the research projects.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

<b>SEMESTER IV</b>	<b>COURSE CODE: JPSW1016</b>					<b>TITLE OF THE COURSE: RESEARCH PROJECT</b>					<b>HOURS :6</b>	<b>CREDITS:6</b>
<b>COURSE OUTCOMES (CO)</b>	<b>PROGRAMME OUTCOMES (PO)</b>					<b>PROGRAMME SPECIFIC OUTCOMES (PSO)</b>					<b>MEAN SCORE OF CO'S</b>	
	<b>P01</b>	<b>P02</b>	<b>P03</b>	<b>P04</b>	<b>P05</b>	<b>PS01</b>	<b>PS02</b>	<b>PS03</b>	<b>PS04</b>	<b>PS05</b>		
<b>CO1</b>	4	5	4	4	4	4	4	5	4	4	<b>4.2</b>	
<b>CO2</b>	2	5	4	3	4	4	4	5	4	4	<b>3.9</b>	
<b>CO3</b>	4	5	4	4	4	4	4	4	4	4	<b>4.1</b>	
<b>CO4</b>	3	5	2	4	4	4	3	5	5	5	<b>4</b>	
<b>CO5</b>	4	5	3	4	4	4	4	5	5	5	<b>4.3</b>	
<b>Mean Overall Score</b>											<b>4.1</b>	

**Result: The Score of this Course is 4.1(Very High)**

<b>Association</b>	<b>1%-20%</b>	<b>21%-40%</b>	<b>41%-60%</b>	<b>61%-80%</b>	<b>81%-100%</b>
<b>Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Interval</b>	<b>0&lt;=rating&lt;=1</b>	<b>1.1&lt;=rating&lt;=2</b>	<b>2.1&lt;=rating&lt;=3</b>	<b>3.1&lt;=rating&lt;=4</b>	<b>4.1&lt;=rating&lt;=5</b>
<b>Rating</b>	<b>Very Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>High</b>	<b>Very High</b>

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome.

The students are placed under a supervisor for the research project work. The students are encouraged to start the project work in the third semester itself. Review meeting of three stages will be held in 20 days interval to monitor and guide the Students' Research Project.

### **Schedule for Review Meetings**

- Review Meet I – Finalization of Topic, Tool and Proposal
- Review Meet II – Introduction and Review of the Literature
- Review Meet III – Data Analysis, Interpretation, Findings and Suggestions

In the fourth semester the students complete the research study and submit the final copy for valuation. At the end of the semester Viva- Voce is conducted by external examiners for 100 marks.

Research Report Format (The Research Project Report should be typed in Times New Roman Font, 12 font size with 1.5 line space)

1. Outer Cover
2. Title Page
3. Certificate
4. Preface
5. Acknowledgement
6. Table of Contents
7. List of Tables
8. List of Figures
9. List of Plates (if any)

{(The above nine items are the preliminaries of the research report, which should be numbered in Roman small numbers at the bottom of the page e. g. i, ii, iii. ) Arabic numbers are used for the following items.}

- Chapter I : Introduction
  1. A brief General Introduction
  2. Statement of the Research Problem
  3. Need / Significance / Importance of the Study
- Chapter II : It consists of Review of Literature (with an appropriate title)  
This chapter ends with General and Specific Objectives
- Chapter III : Methodology  
This chapter describes the various steps used in carrying out the research task. It is described in the past tense.
  1. Chapter Introduction
  2. Field of Study.
  3. Pilot Study
  4. Research Design
  5. Selection of Sample
  6. Tools of Data Collection
  7. Sources of Data
  8. Pre testing
  9. Actual Data Collection
  10. Definition of Terms
  11. Analysis

	12. Limitations
	13. Organisation of the Report
Chapter IV	: Analysis and Interpretation This chapter presents the analyzed data either by a table or a chart and not both for the same variable. The variable name is given as a sub title, introduction of the variable, presentation of data (table No. and table title) analysis then interpretation of data. Interpretation is not mere description of the numbers into words but giving meaning for the data distribution.
Chapter V	: Main Findings (Percentage in brackets) and Suggestions
Chapter VI	: Summary and Conclusion
Bibliography	: It is arranged in the alphabetical order by the author's name. Author's surname, year, title, place, publisher
	Appendix

<b>II – M.S.W</b>	<b>BLOCK FIELD WORK PRACTICUM (INTERNSHIP)</b>	<b>19PSWF5</b>
<b>SEMESTER – IV</b>		<b>HRS: 1 Month</b>
<b>EXTENSION – III</b>		<b>CREDIT : 4</b>

**OBJECTIVE:**

To have practical knowledge in different settings (NGO, Hospital and Industries).

**COURSE OUTCOMES (COs)**

After completing this course, students will:

**CO1:** Be applicable of practical knowledge in different settings.

**CO2:** Learn the role of HR manager in industries.

**CO3:** Learn the role of social worker in NGO settings.

**CO4:** Understand the role of medical social worker.

**CO5:** Be exposed to various skills in different settings.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

<b>SEMESTER IV</b>	<b>COURSE CODE: 19PSWF5</b>					<b>TITLE OF THE COURSE: BLOCK FIELD WORK PRACTICUM</b>					<b>HOURS :1 Month</b>	<b>CREDITS:4</b>
<b>COURSE OUTCOMES (CO)</b>	<b>PROGRAMME OUTCOMES (PO)</b>					<b>PROGRAMME SPECIFIC OUTCOMES (PSO)</b>					<b>MEAN SCORE OF CO'S</b>	
	<b>P O1</b>	<b>P O2</b>	<b>P O3</b>	<b>P O4</b>	<b>P O5</b>	<b>PS O1</b>	<b>PS O2</b>	<b>PS O3</b>	<b>PS O4</b>	<b>PS O5</b>		
<b>CO1</b>	5	4	5	4	5	5	4	3	5	5	<b>4.5</b>	
<b>CO2</b>	5	3	5	4	5	5	5	3	5	5	<b>4.5</b>	
<b>CO3</b>	5	3	5	4	5	5	5	3	5	5	<b>4.5</b>	
<b>CO4</b>	5	3	5	4	5	5	5	3	5	5	<b>4.5</b>	
<b>CO5</b>	5	4	5	4	5	5	5	4	5	5	<b>4.7</b>	
	<b>Mean Overall Score</b>										<b>4.54</b>	

**Result: The Score of this Course is 4.54(Very High)**

<b>Association</b>	<b>1%-20%</b>	<b>21%-40%</b>	<b>41%-60%</b>	<b>61%-80%</b>	<b>81%-100%</b>
<b>Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Interval</b>	<b>0&lt;=rating&lt;=1</b>	<b>1.1&lt;=rating&lt;=2</b>	<b>2.1&lt;=rating&lt;=3</b>	<b>3.1&lt;=rating&lt;=4</b>	<b>4.1&lt;=rating&lt;=5</b>
<b>Rating</b>	<b>Very Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>High</b>	<b>Very High</b>

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome

The last month of the fourth semester the students go for block field placement training according to their fields of specialization (24 working days). The student has to be part of the organization and take part in all the activities of the organization and undertake the assignments given to him. After completion of one month placement the student submits an activity sheet, attendance certificate, daily reports to the department.

Every week the students write a report of their activities and submit to the concerned field work supervisor. The supervisor conducts individual and group conference every week regularly. At the end of the semester Viva- Voce is conducted by two examiners. 20 marks are being awarded by the internal faculty supervisor, 20 Marks are awarded by the Agency Supervisor and 60 marks are being awarded by the external examiner.

**Block Field Work Practicum Marks Assessment**

S. No	Assigned Work	Internal	External
		Faculty	External Examiner
1	Selecting the Agency, Report Submission, Agency Profile	40	
2	Presentation, Quality in Components, Communication		60
	Total	100	

## THEORY EXAMINATION EVALUATION COMPONENT

### Continuous Internal Assessment (CIA) (25)

Assignment	-	5 Marks
Seminar	-	5 Marks
Two written Examination	-	15 Marks
Total	-	25 Marks

### CIA Question Pattern (Written Examination)

Part – A (10X2=20)  
(Answer all the Question)

Part – B (6X5=30)  
(Answer all the Questions)

### MODEL QUESTION PAPER FOR CIA

#### PART - A

Answer **ALL** Questions

(10X2=20)

1. What is Social Policy?
2. List any two Objectives of Social Policy.
3. Who is the father of Indian Constitution? In which year the constitution was passed by the Constituent Assembly?
4. List any two Characteristics of Indian Constitution.
5. List any two policies and Programmes for the welfare of Women in India.
6. List few features of National Health Policy, 2002.
7. Write a note on National Policy for Children, 2013.
8. What is Social Legislation?
9. Write a note on Indian Penal Code.
10. What is Public Interest Litigation?

#### PART – B

Answer **ALL** Questions

(5X6=30)

11. Bring out the Evolution of Indian Constitution in detail.
12. Critically examine the Fundamental Rights guaranteed in the Indian Constitution.
13. Enumerate various policies and programmes for the Education in India.
14. Explain in detail about Family Court and various cases heard in the Family court today.
15. Write in short about few famous legislations in India.

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## SEMESTER EXAMINATION

### Question Pattern

Time: 3 Hours

Max. Marks: 75

#### Section – A (10X2=20)

(Answer all the Question)

Two questions from each unit

#### Section – B (5X5=25)

(Answer either a or b from each Question)

Two questions from each unit

#### Section – C (3X10=30)

(Answer any three from five Questions)

One question from each unit

## MODEL QUESTION PAPER FOR SEMESTER

ST. JOSEPH'S COLLEGE OF ARTS & SCIENCE (AUTONOMOUS)

19PSW42C – COMMUNITY HEALTH

Time: 3 Hours

Max Marks: 75

### SECTION – A (10X2=20)

Answer ALL Questions

1. Define Health.
2. What is meant by health system?
3. Give the meaning of community.
4. What is Indigenous system of health?
5. Mention any two impact of ESI Act.
6. Define vital statistics.
7. List out any four programmes under National Health Policy.
8. List the advantages of Health Polices.
9. Mention any two preventive measures for blindness.
10. List the salient feature of NLEP.

**SECTION - B (5X5=25)**

Answer **ALL** Questions

11. a. Elaborate the Emerging need for palliative & Geriatric care.  
(or)  
b. Explore the importance of vital health statistics.
12. a. Narrate the concept of Public health development in India.  
(or)  
b. Give details of Pediatric health problems in India.
13. a. Highlight the salient features of consumer protection Act with respect to patients.  
(or)  
b. Elaborate the Medical negligence liability under the consumer protection act.
14. a. What should be done to elicit community to solve health problems?  
(or)  
b. Describe the objectives of health policies.
15. a. Enumerate the welfare programmes for the physically challenged.  
(or)  
b. Explain in detail about School Health Programme.

**SECTION – C (3X10=30)**

Answer any **THREE** Questions

16. Illustrate the health problems in a rural community and suggest measures in eradicating the problems.
17. Share your views from the field work Experience in community medicine.
18. Discuss the functions of Environment Protection Act.
19. Highlight the salient features of MTP Act 1971.
20. Briefly explain about Diarrhea Disease Control Programme.

## SELF STUDY COURSES

II – M.S.W	<b>CHILD WELFARE AND SOCIAL WORK</b>	SPS34A
SEMESTER –III		HOURS: NIL
SELF STUDY– I (A)		CREDITS: 2

### OBJECTIVE:

To recognize child welfare concepts and welfare services.

### COURSE OUTCOMES (COs)

After completing this course, students will:

**CO1:** Understand basic theoretical knowledge on child welfare concepts and Institution working for child Welfare

**CO2:** Equip them with the knowledge on welfare services of children

**CO3:** Be enabled to work in the different field - based legislations related to children

**CO 4:** Create knowledge on various issues related to children

**CO5:** Address the problems of women and children

### Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes

SEMESTER III	COURSE CODE: SPS34A					TITLE OF THE COURSE: CHILD WELFARE AND SOCIAL WORK					HOURS: Nil	CREDITS: 2
COURSE OUTCOMES (CO)	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)					MEAN SCORE OF CO'S	
	P O1	P O2	P O3	P O4	P O5	PS O1	PS O2	PS O3	PS O4	PS O5		
CO1	5	4	5	5	4	5	5	4	4	5	4.6	
CO2	5	4	5	4	4	5	5	4	4	5	4.5	
CO3	5	4	5	4	4	5	5	4	4	5	4.5	
CO4	5	4	5	4	4	5	4	4	4	5	4.4	
CO5	4	4	4	5	4	5	4	4	4	5	4.3	
<b>Mean Overall Score</b>											<b>4.46</b>	

**Result: The Score of this Course is 4.46(Very High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome.

## **UNIT I**

Child: meaning, demographic profile of children in India – rural & urban, its place in family and society; status of girl child; concept of socialization; factors influencing socialization; role of family in socialization; parental socialization during childhood and adolescence; role of peers in socialization, role of school in socialization; impact of television on children.

## **UNIT II**

Problems of Children: childhood diseases and immunization; behaviour disorders of children; causes, consequences and prevention of child malnutrition, nutritional disorders, neglected children and abused children, child workers, child trafficking, child prostitution, HIV/AIDS affected and infected children

## **UNIT III**

Child Education and Problems: Children with disabilities, School dropouts; Rural – Urban and gender differences – Problems in school settings. School Social Work: Concept, Need, Objectives, and Functions. – Child friendly schools initiative. Child Participation.

## **UNIT IV**

Internationals and National instruments to promote and protect rights of children United Nations Charter of Children's Rights and Constitutional directives, Child welfare policies and programmes for children. Legislations relevant for protecting the rights of children-The Children (Pledging of Labour) Act 1935 - Employment of Children Act, 1938 – Minimum Wages Act 1948 - Child Labour (Prohibition and Regulation) Act 1986 – Juvenile Justice Act 2001.

## **UNIT V**

Role and Functions of Professional Social worker in Family setting, Institutional settings, Child Guidance Clinic, Children's hospital, Foster care and adoption, Rehabilitation settings. Child help line services, School Social work – Current research studies in India on Child Rights, Child related services and issues – Specific skills required for Social Work intervention with the children.

## **TEXT BOOKS:**

1. Chowdhry, Paul D (2000): Child Welfare Manual, Atma Ram & Sons Publishers, New Delhi.
2. Lawrence Shulman, 2015, Social Work Practice in Child Welfare, NASW Press.
3. Philip Popple, 2005, Child Welfare Social Work, Pearson Publications.
4. Proactive Child Protection Social Work Second Edition. 2014, Sage Publications India Private Ltd.
5. Sharma Vivek. 2014. UGC NET Tutor Social Work, Arihant Publications, New Delhi.
6. UGC NET/ SET Social Work Trueman's Specific series, 2016, Danika Publishing Company.

**REFERENCE BOOKS:**

1. Bhat, Bilal (2011): Rehabilitation of Child Labour: Problems and Prospects. Shipra Publications, Delhi.
2. Chowdhry, Paul D (2000): Child Welfare Manual, Atma Ram & Sons Publishers, New Delhi.
3. Deb, Sibnath and Aparna Mukherjee (2009): Impact of Sexual Abuse on Mental Health of Children. Concept Publishing Company, New Delhi.
4. Goonesekere, Savitri (2000): Children, Law and Justice: A South Asian Perspective. Sage Publication, New Delhi.
5. Lieten, G. K., (2004). Working children around the world: Child rights and child reality. Institute for Human Development, New Delhi and IREWOC Foundation, Amsterdam.

<b>II – M.S.W</b>	<b>CARING THE PERSONS WITH DISABILITIES</b>	<b>SPS34B</b>
<b>SEMESTER –III</b>		<b>HOURS: NIL</b>
<b>SELF STUDY– I (B)</b>		<b>CREDITS: 2</b>

**OBJECTIVE:**

To identify the forms of disability and the welfare schemes.

**COURSE OUTCOMES (COs)**

After completing this course, students will:

**CO1:** Identify forms of disabilities.

**CO2:** Learn to diagnose and assess the functional abilities.

**CO3:** Be exposed to rehabilitative measure.

**CO4:** Understand the approaches in rehabilitation.

**CO5:** Be determined to the role of the social worker in this setting.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

<b>SEMESTER III</b>	<b>COURSE CODE: SPS34B</b>					<b>TITLE OF THE COURSE: CARING THE PERSONS WITH DISABILITIES</b>					<b>HOURS: Nil</b>	<b>CREDITS: 2</b>
<b>COURSE OUTCOMES (CO)</b>	<b>PROGRAMME OUTCOMES (PO)</b>					<b>PROGRAMME SPECIFIC OUTCOMES (PSO)</b>					<b>MEAN SCORE OF CO'S</b>	
	<b>P O1</b>	<b>P O2</b>	<b>P O3</b>	<b>P O4</b>	<b>P O5</b>	<b>PS O1</b>	<b>PS O2</b>	<b>PS O3</b>	<b>PS O4</b>	<b>PS O5</b>		
<b>CO1</b>	5	4	5	4	5	5	5	4	4	5	<b>4.6</b>	
<b>CO2</b>	5	4	5	4	4	5	4	5	4	4	<b>4.4</b>	
<b>CO3</b>	4	4	4	3	5	4	5	4	4	4	<b>4.1</b>	
<b>CO4</b>	5	4	4	4	3	5	5	4	3	4	<b>4.1</b>	
<b>CO5</b>	5	4	4	5	4	4	4	3	3	4	<b>4</b>	
<b>Mean Overall Score</b>											<b>4.24</b>	

**Result: The Score of this Course is 4.24(Very High)**

<b>Association</b>	<b>1%-20%</b>	<b>21%-40%</b>	<b>41%-60%</b>	<b>61%-80%</b>	<b>81%-100%</b>
<b>Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Interval</b>	<b>0&lt;=rating&lt;=1</b>	<b>1.1&lt;=rating&lt;=2</b>	<b>2.1&lt;=rating&lt;=3</b>	<b>3.1&lt;=rating&lt;=4</b>	<b>4.1&lt;=rating&lt;=5</b>
<b>Rating</b>	<b>Very Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>High</b>	<b>Very High</b>

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome.

## **UNIT I**

Definition of impairment, Disability, handicap: Types of various Disabilities: magnitude, Causes and consequences.

## **UNIT II**

Identification, Assessment of functional abilities and differential diagnosis. Myths and misconceptions, societal attitudes, reactions of parents, family members and ways of coping. Prevention of disabilities at primary, secondary and Tertiary levels, Intervention strategies at individual, family and community levels.

## **UNIT III**

Agencies involved in the field of rehabilitations, Multidisciplinary rehabilitation team and their roles, Educational Institutes, Vocational Rehabilitation centers, State and Central Government Agencies, National and International non- governmental organizations (AICB NAB &CBM etc.) National policies and welfare programmes.

## **UNIT IV**

Accessibility and Assistive devices, Accessible India Campaign, Inclusive India campaign, CBR, (Community based rehabilitation).

## **UNIT V**

Acts related to Persons with disabilities. Persons with Disability Act-2016, Rehabilitation Council of India Act-1992, National Trust Act-1999, United Nation Convention on the Rights of Persons with Disabilities (UNCRPD)

### **TEXT BOOKS:**

1. Albrecht G.L, et al (2001) Hand Book of disability Studies, Sage, London.
2. Dr. Rumi Ahmed, Rights of Persons with Disability, White Falcon Publishing Solutions LIP.
3. Dr. S. Alice Mathew, 2016, Learning Disability and Remediation, Neelkamal Publications.
4. UGC NET/ SET Social Work Trueman's Specific series, 2016, Danika Publishing Company.
5. Upali Chakravarti, Disability and Care Work, Sage Publications India Private Ltd.

### **REFERENCE BOOKS:**

1. Albrecht G.L, et al (2001) Hand Book of disability Studies, Sage, London
2. Blaxter M. (1976), The meaning of disability: A sociological study of impairment, London: Heinemann.
3. Grant, (2005) Learning disability: A lifecycle approach to valuing people, Open University Press, London
4. Hegarty Seamus & Mithu Alur, (2002) Education and Children with special needs, sage, London,
5. Karanth, Pratibha& Joe Rozario, (2003) Learning disability in India, Sage, London
6. Mani M.N.G & Jaiganesh. M. B, (2010). Source Book on disability, Coimbatore: UDIS Forum.
7. Moore, (2005) Researching disability issues, Open University Press, London.
8. Samus, H & Patri. A (eds). Women disability and identity, New Delhi: Sage publications.

<b>I – M.S.W</b>	<b>HOSPITAL ADMINISTRATION</b>	<b>SPS34C</b>
<b>SEMESTER –III</b>		<b>HOURS: Nil</b>
<b>SELF STUDY – I (C)</b>		<b>CREDITS: 2</b>

**OBJECTIVE:**

To understand the Hospital Administration.

**COURSE OUTCOMES (COs)**

After completing this course, students will:

**CO1:** Be clear about the hospital and its classification.

**CO2:** Be exposed to planning and process.

**CO3:** Understand the hospital administration.

**CO4:** Understand the staffing and recruitment process.

**CO5:** Gain knowledge on hospital budgeting.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

<b>SEMESTER III</b>	<b>COURSE CODE: SPS34C</b>					<b>TITLE OF THE COURSE: HOSPITAL ADMINISTRATION</b>					<b>HOURS : Nil</b>	<b>CREDITS: 2</b>
<b>COURSE OUTCOMES (CO)</b>	<b>PROGRAMME OUTCOMES (PO)</b>					<b>PROGRAMME SPECIFIC OUTCOMES (PSO)</b>					<b>MEAN SCORE OF CO'S</b>	
	<b>P O1</b>	<b>P O2</b>	<b>P O3</b>	<b>P O4</b>	<b>P O5</b>	<b>PS O1</b>	<b>PS O2</b>	<b>PS O3</b>	<b>PS O4</b>	<b>PS O5</b>		
<b>CO1</b>	4	2	5	3	5	5	4	3	4	5	<b>4</b>	
<b>CO2</b>	5	3	5	4	5	5	5	4	4	4	<b>4.4</b>	
<b>CO3</b>	5	3	5	4	5	5	5	3	5	5	<b>4.5</b>	
<b>CO4</b>	5	3	5	4	5	5	5	3	5	5	<b>4.5</b>	
<b>CO5</b>	4	3	4	4	4	5	4	3	4	5	<b>4</b>	
<b>Mean Overall Score</b>											<b>4.28</b>	

**Result: The Score of this Course is 4.26(Very High)**

<b>Association</b>	<b>1%-20%</b>	<b>21%-40%</b>	<b>41%-60%</b>	<b>61%-80%</b>	<b>81%-100%</b>
<b>Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Interval</b>	<b>0&lt;=rating&lt;=1</b>	<b>1.1&lt;=rating&lt;=2</b>	<b>2.1&lt;=rating&lt;=3</b>	<b>3.1&lt;=rating&lt;=4</b>	<b>4.1&lt;=rating&lt;=5</b>
<b>Rating</b>	<b>Very Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>High</b>	<b>Very High</b>

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome



## **UNIT I**

Meaning of hospital, Evaluation of Hospital from charity to modern hospital classification of hospitals, General, special, public, Trust, Teaching-cum Research Hospital, Small or Large Size Hospital.

## **UNIT II**

Planning a Hospital, Planning Process, choosing a Site, Location and Access, Building Space Utilization, Physical Facilities- residential facilities requirements of various types of wards, out patient's services and in-patients services emergency services in Hospital - Medico legal case - Different departments required in the hospital.

## **UNIT III**

Hospital Administration -Meaning, Nature and Scope Management of Hospitals- principles of Management need for Scientific management. Human resource management in Hospital personnel policies - Condition of Employment Promotional and Transfers - Performance appraisal. Working hours levels rules and benefits - safety conditions - salary and wages policies, Training and development.

## **UNIT IV**

Staffing the hospital - selection and requirement of medical professional and technical staff - social workers -physiotherapist and occupational therapist Pharmacist - Radiographers - Lab technicians - dieticians - records officers - mechanics - electricians. Roles of Medical Records in Hospital Administration Content and their needs in the patient care system.

## **UNIT V**

Hospital Budget - Department budget as a first step - specific elements of a department at budget including staff salary - supply cost- projected replacement of equipment - energy expenditures - contingency funds. Uses of computers in Hospital purchase centralization Shared Building system purchase agreements.

### **TEXT BOOKS:**

1. B. M. Sakharkar, 2004, Principles of Hospital Administration and Planning, Jaypee Publications.
2. Benjamin Robert, et al 1983, Hospital Administration Desk Book New Jerky Prentice hall
3. DC Joshi, 2008, Hospital Administration, Jaypee Publications.
4. Joydeep Das Gupta, 2009, Hospital Administration and Management, a Comprehensive guide, Jaypee Publications.
5. Goal S L 1981, Health care Administration A Text Book New Delhi Sterling Publishers Pvt.

### **REFERENCE BOOKS:**

1. Davies Rlawelyn., etal. 1966, Hospital planning & administration Geneva WHO
2. Rabick & Jonathan etal. 1983, Hospital Organization and Management London Spectrum Publishers. 5. Who Expert Committee 1975, Role of Hospital in programme of Community health protection WHO technical Report service.
3. WHO Expert Committee.1968. Hospital Administration WHO technical Report Services No.395.

<b>II – M.S.W</b>	<b>WORKING WITH ELDERLY PEOPLE</b>	<b>SPS34D</b>
<b>SEMESTER –III</b>		<b>HOURS: NIL</b>
<b>SELF STUDY – I (D)</b>		<b>CREDITS: 2</b>

**OBJECTIVE:**

To understand the functions and theories of ageing and kinds of service rendered to the aged people.

**COURSE OUTCOMES (COs)**

After completing this course, students will:

**CO1:** Understand the functions and theories of ageing.

**CO2:** Learn about the policies and Programme for the elder people.

**CO3:** Be exposed to family context and relationship.

**CO4:** Understand the kinds of service rendered to the aged people.

**CO5:** Be determined to the family intervention techniques.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

<b>SEMESTER III</b>	<b>COURSE CODE: SPS34D</b>					<b>TITLE OF THE COURSE:WORKING WITH ELDERLY PEOPLE</b>					<b>HOURS: Nil</b>	<b>CREDITS:2</b>
<b>COURSE OUTCOMES (CO)</b>	<b>PROGRAMME OUTCOMES (PO)</b>					<b>PROGRAMME SPECIFIC OUTCOMES (PSO)</b>					<b>MEAN SCORE OF CO'S</b>	
	<b>P O1</b>	<b>P O2</b>	<b>P O3</b>	<b>P O4</b>	<b>P O5</b>	<b>PS O1</b>	<b>PS O2</b>	<b>PS O3</b>	<b>PS O4</b>	<b>PS O5</b>		
<b>CO1</b>	4	4	5	4	5	5	5	4	4	5	<b>4.5</b>	
<b>CO2</b>	5	4	5	4	4	5	5	4	3	4	<b>4.3</b>	
<b>CO3</b>	4	4	4	3	4	4	5	4	4	4	<b>4</b>	
<b>CO4</b>	4	3	4	3	4	5	4	4	5	4	<b>4</b>	
<b>CO5</b>	5	4	4	3	4	5	4	4	3	4	<b>4</b>	
<b>Mean Overall Score</b>											<b>4.16</b>	

**Result: The Score of this Course is 4.16(Very High)**

<b>Association</b>	<b>1%-20%</b>	<b>21%-40%</b>	<b>41%-60%</b>	<b>61%-80%</b>	<b>81%-100%</b>
<b>Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Interval</b>	<b>0&lt;=rating&lt;=1</b>	<b>1.1&lt;=rating&lt;=2</b>	<b>2.1&lt;=rating&lt;=3</b>	<b>3.1&lt;=rating&lt;=4</b>	<b>4.1&lt;=rating&lt;=5</b>
<b>Rating</b>	<b>Very Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>High</b>	<b>Very High</b>

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome

## **UNIT I**

Ageing: Definition, Concept– Dimensions of Ageing: Physiological, Psychological, Social and Functional – Theories of Ageing: Biological, Psychological & Social. Problems of Ageing: Social, Economic and Psychological–Demographic Aspects of Population, Ageing-National and International Trends – Status of the Aged in India – Ageing and Development.

## **UNIT II**

Policies and Programmes: UN- Principles, International Plan of Action and Programme on Ageing. Government Policies and Programmes and welfare Schemes for the Elderly in India.

## **UNIT III**

Family Context– Intimate Ties or Partnership in Later Life, Transitions in Marital Status: Widowhood, Divorce and Remarriage, Inter-Generational Relations: Common Medical and Psychiatric Problems of Old age, Institutionalization and Related Problems.

## **UNIT IV**

Services for the Aged: Geriatric Clinics, Old Age Homes, Facilities & Services for the Terminally Ill, Recreational Centres, Day Care Centre, Information and Referral Services, Preventive and Supportive Services.

## **UNIT V**

Application of CW, GW, Research & CO with Elderly: Gerontology and geriatrics, Case Work, Group Work, Research and Counselling. Family Intervention Techniques, Health Promotion, Disability Management, Role of Social Workers

### **TEXT BOOKS:**

1. A. Murphy, 1994, Working with Elderly People, Souvenir Press Ltd.
2. Anne Murphy, 1994, Working with Elderly people a Care workers Hand Book, Thomas Cook Touring Handbook.
3. Desai Murli & Raju Siva, 2000, Gerontological Social Work in India: Some Issues & Perspectives.
4. Sharma Vivek. 2014. UGC NET Tutor Social Work, Arihant Publications, New Delhi.
5. UGC NET/ SET Social Work Trueman's Specific series, 2016, Danika Publishing Company.

### **REFERENCE BOOKS:**

1. Bob G Knight, Psychotherapy with Older Adults, Sage, New Delhi, 2004.
2. Desai Murli & Raju Siva. 2000. Gerontological Social Work in India: Some Issues & Perspectives.
3. Irdhaya Rajan, S., Mishra. India's Elderly Burden or Challenge, Sankara Sarma, P. Sage, New Delhi, 1999.
4. Kumudini Dandekar, The Elderly in India, Sage, New Delhi, 1996.
5. Ward, The Ageing Experience: An introduction to Social Gerontology, Harpen & Rere New York, 1984.

<b>II – M.S.W</b>	<b>WOMEN AND DEVELOPMENT</b>	<b>SPS34E</b>
<b>SEMESTER –III</b>		<b>HOURS: NIL</b>
<b>SELF STUDY – I (E)</b>		<b>CREDITS: 2</b>

**OBJECTIVE:**

To understand the functions of women development.

**COURSE OUTCOMES (COs)**

After completing this course, students will:

**CO1:** Understand the functions of women development.

**CO2:** Learn the importance of women education.

**CO3:** Be exposed to gender analysis and relationship.

**CO4:** Understand the women problems and circumstances.

**CO5:** Be aware of the role of state and national level commission in women's development.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

<b>SEMESTER III</b>	<b>COURSE CODE: SPS34E</b>					<b>TITLE OF THE COURSE:WOMEN AND DEVELOPMENT</b>					<b>HOURS: Nil</b>	<b>CREDITS:2</b>
<b>COURSE OUTCOMES (CO)</b>	<b>PROGRAMME OUTCOMES (PO)</b>					<b>PROGRAMME SPECIFIC OUTCOMES (PSO)</b>					<b>MEAN SCORE OF CO'S</b>	
	<b>P O1</b>	<b>P O2</b>	<b>P O3</b>	<b>P O4</b>	<b>P O5</b>	<b>PS O1</b>	<b>PS O2</b>	<b>PS O3</b>	<b>PS O4</b>	<b>PS O5</b>		
<b>CO1</b>	4	4	4	3	4	4	5	3	4	4	<b>3.9</b>	
<b>CO2</b>	4	4	5	4	3	4	4	3	4	4	<b>3.9</b>	
<b>CO3</b>	4	3	4	4	3	5	4	3	4	4	<b>3.8</b>	
<b>CO4</b>	4	3	5	4	3	4	4	4	4	4	<b>3.9</b>	
<b>CO5</b>	4	4	5	4	4	5	4	3	4	4	<b>4.1</b>	
<b>Mean Overall Score</b>											<b>3.98</b>	

**Result: The Score of this Course is 3.98(High)**

<b>Association</b>	<b>1%-20%</b>	<b>21%-40%</b>	<b>41%-60%</b>	<b>61%-80%</b>	<b>81%-100%</b>
<b>Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Interval</b>	<b>0&lt;=rating&lt;=1</b>	<b>1.1&lt;=rating&lt;=2</b>	<b>2.1&lt;=rating&lt;=3</b>	<b>3.1&lt;=rating&lt;=4</b>	<b>4.1&lt;=rating&lt;=5</b>
<b>Rating</b>	<b>Very Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>High</b>	<b>Very High</b>

This Course is having **HIGH** association with Programme Outcome and Programme Specific Outcome.

## **UNIT I**

Concept of development with reference to women: Women in development, women and development, Gender in development – meaning, strategic and practical needs, Patriarchy and patriarchal structures in India. Feminism and its types. Women's movements.

## **UNIT II**

Education: Differences between male and female children in enrolment and educational achievement, problems in education of the girl child, participation in higher education; NGO and Government efforts to improve women's education. Employment: work participation of women, trends, exploitation of women, multiple roles of women. Health issues of women in India: Health problems, maternal health, maternal mortality, family planning choices and access to health services. HIV/AIDS and impact on women in India.

## **UNIT III**

Gender analysis and its framework: Moser Framework, Social Relations Framework (SRF) (Kabeer), Harvard Framework, Gender Analysis Matrix (Parker), Women's Empowerment Framework (Longwe). Gender Census, Sex Ratio, WID, WAD, GAD. Gender Mainstreaming, Gender budgeting. Self Help Groups: benefits, procedures and best practices.

## **UNIT IV**

Women in difficult circumstances: sex work, female headed households, women and displacement, women and disasters or riots and war, violence against women, transgender. Legal rights of women (salient features only): Marriage, divorce, maintenance, inheritance, adoption, employment, maternity benefits.

## **UNIT V**

International conventions and efforts: CEDAW, Beijing Conference, International organizations and policies. Development programmes for women - Government policies and programmes for women-State and Center; Constitutional provisions; reservations for women. Best practices, Conventions, Committees, Policies and programmes. Role of National and State Women's Commissions

**TEXT BOOKS:**

1. Anjali Gandhi, 2012, Women's Work Health and Empowerment, Aakar Books Publishers.
2. Dr. Grishma, 2017, Women Empowerment Challenges and Strategies, Books clinic Publishing
3. Jaynal Ud Din Ahmed, Women Entrepreneurship in India, New Century Publication.
4. Kanhere U S (1995) Women and Socialization, Mittal Publishers, New Delhi.
5. Sharma Vivek. 2014. UGC NET Tutor Social Work, Arihant Publications, New Delhi.

**REFERENCE BOOKS:**

1. Bhasin, K (1984), Women and media – analysis, alternatives and actions, Kali for Women, New Delhi
2. Blumberg and Dwaraki (1980), India's educated women: options and constraints, Hindustan Publishing corporation, New Delhi
3. Devendar, Kiran (1985), Status and position of women in India, Shakthi Books, New Delhi
4. Hamilton r (1992) The liberation of women: a study of patriarchy, George Allen and Unwin, London
5. ICSSR (1985) Status of women in India- report of the National Commission, Allied publishers, New Delhi
6. Kanhere U S (1995) Women and Socialization, Mittal Publishers, New Delhi
7. Kaushik, Susheela (1993) Women's Oppression: patterns and perspective, Shakti Books, New Delhi
8. LWF (1990) Women's Human Rights, Lutheran World Foundation, Geneva.
9. Neera Desai (1987) Women and society in India, Ajanta Publications, New Delhi
10. Usha Rao (1983), Women in Development Society, Ashish Publishing house, New Delhi.

II – M.S.W	COMPENSATION MANAGEMENT	SPS34F
SEMESTER –III		HOURS: NIL
SELF STUDY – I (F)		CREDITS: 2

**OBJECTIVE:**

To know about the concept of compensation management and employee benefits.

**COURSE OUTCOMES (COs)**

After completing this course, students will:

**CO1:** Understand the meaning of compensation.

**CO2:** Learn the managing compensation and its structure.

**CO3:** Be exposed to employer compensation and bonus.

**CO4:** Understand to manage the employee benefits.

**CO5:** Be aware of the employee benefits.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER III	COURSE CODE: SPS34F					TITLE OF THE COURSE:COMPENSATION MANAGEMENT					HOURS: Nil	CREDITS:2
COURSE OUTCOMES (CO)	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)					MEAN SCORE OF CO'S	
	P O1	P O2	P O3	P O4	P O5	PS O1	PS O2	PS O3	PS O4	PS O5		
CO1	4	3	4	4	3	4	3	4	4	3	3.6	
CO2	4	3	4	3	4	4	4	3	4	3	3.6	
CO3	4	3	4	4	3	4	3	4	4	4	3.7	
CO4	4	3	4	4	4	3	4	4	3	4	3.7	
CO5	4	4	4	3	4	4	4	3	4	4	3.8	
<b>Mean Overall Score</b>											<b>3.68</b>	

**Result: The Score of this Course is 3.68(High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **HIGH** association with Programme Outcome and Programme Specific Outcome

## **UNIT I**

Introduction: Compensation meaning, objectives, nature of compensation, types of compensations, compensation responsibilities, Compensation system design issues: Compensations Philosophies, compensation approaches, decision about compensation, compensation- base to pay, individual Vs team rewards, Perceptions of pay Fairness, legal constraints on pay systems.

## **UNIT II**

Managing Compensation: Strategic Compensation planning, determining compensation-the wage mix, Development of a Base Pay System: Job evaluation systems, the compensation structure- Wage and salary surveys, the wage curve, pay grades and rate ranges, preparing salary matrix, government regulation on compensation, fixing pay, significant compensation issues, Compensation as a retention strategy

## **UNIT III**

Variable Pay and Executive Compensation: Strategic reasons for Incentive plans, administering incentive plans, Individual incentive plans-Piecework, Standard hour plan, Bonuses, Merit Pay, Group incentive plans- Team compensation, Gain sharing incentive Plans, Enterprise incentive plans- Profit Sharing plans, Stock Options, ESOPs, executive compensation elements of executive compensation and its management, International compensation Management.

## **UNIT IV**

Managing Employee Benefits: Benefits- meaning, strategic perspectives on benefits-goals for benefits, benefits need analysis, funding benefits, benchmarking benefit schemes, nature and types of benefits, Employee benefits programs- security benefits, retirement security benefits, health care benefits, time-off benefits, benefits administration

## **UNIT V**

Employee benefits required by law, discretionary major employee benefits, creating a work life setting, employee services- designing a benefits package.

### **TEXT BOOKS:**

1. B. D. Singh (2017). Compensation and Reward Management. Excel Books.
2. Bishwant Gosh. Compensation and Reward Management, 2012, Sterling Publishers.
3. D. K. Bhattacharya, 2009, Compensation Management, Oxford University Press.
4. Richard I Henderson, 1997, Performance Appraisal and Compensation Management, Oxford University Press.
5. Sharma Vivek. 2014. UGC NET Tutor Social Work, Arihant Publications. New Delhi.

### **REFERENCE BOOKS:**

1. Dr. Kanchan Bhatia(2014), “ Compensation Management” published by Himalaya Publishing House, ISBN-13: 978-9352022151
2. Henderson (2007), “Compensation Management in a Knowledge - based World” published by Pearson Education India, ISBN-13: 978-8131711101
3. J. Martocchio Joseph (2018), “Strategic Compensation: A Human Resource Management Approach” published by Pearson Education, ISBN-13: 978-9332584839



<b>II – M.S.W</b>	<b>SUMMER PLACEMENT</b>	<b>SPS34G</b>
<b>SEMESTER – III</b>		<b>HOURS: NIL</b>
<b>SELF STUDY – I (G)</b>		<b>CREDITS: 2</b>

At the end of first year, the students can go for non-supervised summer placement for a period of 30 days during summer vacation in an agency or industry related to his or her specialization so as to utilize the Summer Vacation fruitfully to develop the professional self in oneself. Two credits are allotted for this in the third semester after submitting report and certificate of Summer Placement. This is to motivate students to engage in self-learning.

**OBJECTIVE:**

To experience with management operation and work settings.

**COURSE OUTCOMES (COs):**

After completing this course, students will:

**CO1:** Be exposed to the industry and social welfare organization.

**CO2:** Be experienced with management operation and work settings.

**CO3:** Be applying theoretical knowledge into practical.

**CO4:** Carry out research project.

**CO5:** Learn the ethics and role of social worker.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER III	COURSE CODE: SPS34G					TITLE OF THE COURSE: SUMMER PLACEMENT					HOURS: Nil	CREDITS: 2
COURSE OUTCOMES (CO)	PROGRAMME OUTCOMES (PO)					PROGRAMME SPECIFIC OUTCOMES (PSO)					MEAN SCORE OF CO'S	
	P O1	P O2	P O3	P O4	P O5	PS O1	PS O2	PS O3	PS O4	PS O5		
CO1	5	3	5	4	5	5	4	3	5	5	4.4	
CO2	5	4	5	4	5	5	4	3	5	5	4.5	
CO3	5	4	5	4	5	5	4	3	5	5	4.5	
CO4	4	5	4	5	5	4	4	4	4	4	4.3	
CO5	5	3	5	4	5	5	5	3	5	5	4.5	
<b>Mean Overall Score</b>											<b>4.44</b>	

**Result: The Score of this Course is 4.44(Very High)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome.

**Process:**

1. The learner must volunteer to locate a setting (own choice) about two months in advance and explore the possibilities of 10days practice learning and practice placement.
2. The practice learning setting should preferably have a professionally trained social worker on the team of a staff.
3. The department will provide official letter for undertaking training in any organization.
4. The learner is to record the learning and submit a comprehensive report (in the format provided by the department) at the beginning of the third semester both to the department (compulsory) and to the setting (on requirement).
5. Each student is expected to produce certificate of his or her Summer Placement training in the third semester and two credits are allotted to them.

## MODEL QUESTION PAPER FOR SELF STUDY PAPERS

### SECTION – A (10X2=20)

Answer ALL Questions

1. What is the meaning of Compensation?
2. List out the objectives of compensation.
3. What is base to pay?
4. Define Job evaluation.
5. Mention any government regulation on compensation.
6. What is compensation structure?
7. What is bonus?
8. What is Individual incentive?
9. What is Merit Pay?
10. Mention any two Employee Benefits plan.

### SECTION – B (5X6=30)

Answer ANY FIVE Questions

11. Explain about the Compensation system design issues.
12. Elaborate the compensation approaches.
13. Brief about the compensation approaches.
14. Explain benefit schemes, nature and types of benefits.
15. What are the International Compensations Management?
16. Brief about benefits administration.

### EXAMINATION EVALUATION COMPONENT FOR SELF STUDY PAPERS

Assignment (2)	-	25 Marks
Seminar (2)	-	25 Marks
Examination	-	50 Marks
<b>Total</b>	-	<b>100 Marks</b>

## VALUE ADDED COURSE

### 1. Eligibility for Admission to the Course

A candidate who is pursuing the Bachelor Degree or Master Degree is accepted eligible to study this programme.

### 2. Duration of the Course

This course of Study shall be for a month with 2 credits. There will be 30 hours consisting of 1 teaching hour per working day.

### 3. Objectives:

The programme is designed with the following objectives:

- To acquire specific knowledge on NGO Management, folk arts and street play.
- To understand the Project Management Dimensions, Planning and the implementation of Projects.
- To enhance skills and techniques on Project Proposal Writing, street play and folk arts.

### 4. Scope

- a. By studying this programme the student will get knowledge on the following
  - NGO Management, Street play and folk arts
  - Project Management Dimensions, Planning and its implementation
  - Skills and Techniques of Project Evaluation or Resource Mobilization and street play as well as folk arts.
- b. The students will also get motivation to start a Nongovernmental Organization or be the trainer in folk arts and street play in the future.

<b>DURATION – ONE MONTH</b>	<b>NGO MANAGEMENT</b>	<b>CODE: VASW02</b>
		<b>HRS: 30</b>

**OBJECTIVE:**

To understand the concept of NGO and its Management.

**COURSE OUTCOMES (COs)**

On successful completion of the course the students should enrich their knowledge about

**CO1:** NGO Management

**CO2:** Project Management Dimensions, Planning and its implementation

**CO3:** Skills and Techniques of Project management Evaluation or Resource Mobilization.

**CO4:** They will get motivation to start a Nongovernmental Organization.

**CO5:** Knowledge on function of NGO through Field based visit to NGOs.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

<b>DURATION – ONE MONTH</b>	<b>COURSE CODE: VASW02</b>					<b>TITLE OF THE COURSE: NGO MANAGEMENT</b>					<b>HOURS: 30</b>	<b>CREDITS:</b>
	<b>PROGRAMME OUTCOMES (PO)</b>					<b>PROGRAMME SPECIFIC OUTCOMES (PSO)</b>						
<b>COURSE OUTCOMES (CO)</b>	<b>P01</b>	<b>P02</b>	<b>P03</b>	<b>P04</b>	<b>P05</b>	<b>PS01</b>	<b>PS02</b>	<b>PS03</b>	<b>PS04</b>	<b>PS05</b>		
<b>CO1</b>	5	2	5	3	5	5	4	3	5	5	<b>4.2</b>	
<b>CO2</b>	5	3	5	4	5	5	4	3	5	5	<b>4.4</b>	
<b>CO3</b>	5	3	5	4	5	5	5	4	4	5	<b>4.5</b>	
<b>CO4</b>	4	3	5	3	5	5	3	4	4	4	<b>4</b>	
<b>CO5</b>	4	2	4	3	4	5	4	3	4	4	<b>3.7</b>	
<b>Mean Overall Score</b>											<b>4.16</b>	

**Result: The Score of this Course is 4.16(Very High)**

<b>Association</b>	<b>1%-20%</b>	<b>21%-40%</b>	<b>41%-60%</b>	<b>61%-80%</b>	<b>81%-100%</b>
<b>Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Interval</b>	<b>0&lt;=rating&lt;=1</b>	<b>1.1&lt;=rating&lt;=2</b>	<b>2.1&lt;=rating&lt;=3</b>	<b>3.1&lt;=rating&lt;=4</b>	<b>4.1&lt;=rating&lt;=5</b>
<b>Rating</b>	<b>Very Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>High</b>	<b>Very High</b>

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome

## **UNIT I**

Management: Meaning, Definition, Concepts, Objectives and Functions. NGO's: Meaning, Definition, Concepts, Vision, Mission, Goals, Types, Functions and Approaches. Role of NGOs in Community Development.

## **UNIT II**

Legal - rational structure of Non-profits: Trusts and Societies with Special reference to Trust and Society Registration Acts- Foreign contributions and Regulation Act (FCRA) - Statutory Obligations- Income Tax Exemption (80-G, 12-A, & 35AC): Rules and Regulation - Resource Mobilization: Methods and Techniques of Fund Raising - International, National and Local Levels.

## **UNIT III**

Leadership in the NGO's Context – Practice of Human resources Management in NGO's - Human Resources Management and role of creating change agents – Staffing, recruiting, induction and training- CSR Activities: Definition, concepts and need - Concentration areas of CSR - Role of social workers in CSR- National and International CSR activities: TVS, Infosys and Tata.

## **UNIT IV**

Concept, Meaning, Definition and Types of projects – Projects Implementation and Management: Project Planning Matrix - Project Cycle Management - Identification and Formulation of Details Projects Report (DPP) with reference to Action AID and Save the Children- Rural Appraisal (PRA): Tools and Techniques, SWOC (Strengths, Weaknesses, Opportunities, and Challenges) Analysis.

## **UNIT V**

3 Field based visits to NGOs in Cuddalore, Villupuram and Pondicherry regions.

**TEXT BOOKS:**

1. Allison, M. & Kaye, J. (2005). Strategic Planning for Nonprofit Organizations, 2nd ed. New York: John Wiley & Sons.
2. Batra, Nitin. 2004. Administration of social Welfare in India. Jaipur: Raj Publishing House.
3. Bhattachary, Sanjay. 2009. Social Work Administration and Development. New Delhi: Rawat Publication
4. Sooryamoorthy R and Gangrade K.D 2006 NGOs in India-A cross Sectional study New Delhi: Rawat Publications.
5. Suresh Chandra Anne Karen Trollope, 2015, Non Governmental Organization Origin and Development, Rawat Publications.

**REFERENCE BOOKS:**

1. Bradford W. Sheafor Charles J. Horejsi, 2011, Techniques and Guidance for Social Work Practice Ninth Edition, Eastern Economy Edition.
2. Robin Lall 2004 The Dynamics of NGO's New Delhi, Dominant Publishers.
3. Harihar Bhattacharya, Parthasarkar and AngshumanKar (eds) (2009) The Politics of Social Exclusion in India: Democracy at the Crossroads, Routledge.
4. P. Subba Rao, 2017. Management and Organization behavior (Text and Cases) Himalaya publishing House.
5. Samvel.C. Certo And S. TrevisCerto. Modern Management. Prentice Hall of India Pvt Ltd. 2007.
6. Sooryamoorthy R and Gangrade K.D. 2006. NGOs in India-A cross Sectional study New Delhi: Rawat Publication.

<b>DURATION – ONE MONTH</b>	<b>FOLK ARTS</b>	<b>CODE: VASW03</b>
		<b>HRS: 30</b>

**OBJECTIVE:**

To learn Folk Arts and tradition of India and Tamilnadu.

**COURSE OUTCOMES (COs)**

On successful completion of the course the students should enrich their knowledge about

**CO1:** Verbal and non-verbal communication

**CO2:** Culture and tradition of India and Tamilnadu.

**CO3:** Folk arts and its historical evolution.

**CO4:** Skills of Kargattam and Kummi

**CO5:** Skills of Kollattam and oyillattam.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

<b>DURATION – ONE MONTH</b>	<b>COURSE CODE: VASW03</b>					<b>TITLE OF THE COURSE: FOLK ARTS</b>					<b>HOURS :30</b>	<b>CREDITS:</b>
	<b>PROGRAMME OUTCOMES (PO)</b>					<b>PROGRAMME SPECIFIC OUTCOMES (PSO)</b>						
<b>COURSE OUTCOMES (CO)</b>	<b>P O1</b>	<b>P O2</b>	<b>P O3</b>	<b>P O4</b>	<b>P O5</b>	<b>PS O1</b>	<b>PS O2</b>	<b>PS O3</b>	<b>PS O4</b>	<b>PS O5</b>		
<b>CO1</b>	5	2	5	3	5	5	4	3	5	5	<b>4.2</b>	
<b>CO2</b>	5	3	5	4	5	5	4	3	5	5	<b>4.4</b>	
<b>CO3</b>	5	3	5	4	5	5	5	4	4	5	<b>4.5</b>	
<b>CO4</b>	4	3	5	3	5	5	3	4	4	4	<b>4</b>	
<b>CO5</b>	4	2	4	3	4	5	4	3	4	4	<b>3.7</b>	
<b>Mean Overall Score</b>											<b>4.16</b>	

**Result: The Score of this Course is 4.16(Very High)**

<b>Association</b>	<b>1%-20%</b>	<b>21%-40%</b>	<b>41%-60%</b>	<b>61%-80%</b>	<b>81%-100%</b>
<b>Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Interval</b>	<b>0&lt;=rating&lt;=1</b>	<b>1.1&lt;=rating&lt;=2</b>	<b>2.1&lt;=rating&lt;=3</b>	<b>3.1&lt;=rating&lt;=4</b>	<b>4.1&lt;=rating&lt;=5</b>
<b>Rating</b>	<b>Very Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>High</b>	<b>Very High</b>

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome



## **UNIT I**

Communication: history, definition, functions and types. Nature Components and purposes. Verbal and Nonverbal communication. Public communication and Impact of Communication for social change.

## **UNIT II**

Culture and Tradition: Definition, Nature and Importance. Media Forms and Techniques. Understanding various Media Forms: Theatre, Dance, Sculpture, Print, and Audio-Visual.

## **UNIT III**

Folk Arts: concept definitions, types. Folk arts in India. Folk arts in Tamilnadu: Classification, History and recent trends.

## **UNIT IV**

Major Folk Arts in Tamilnadu - 1: Kummi – meaning, History and recent trend. Karakattam - meaning, History and recent trend. Practical training on kummi and karakattam.

## **UNIT V**

Major Folk Arts in Tamilnadu – 2 : Oyillattam - meaning, History and recent trend. Kollattam - meaning, History and recent trend. Practical training on kollattam and oyillattam.

## **TEXT BOOKS**

1. Alan Pipes. 2003. Foundations of Art and Design, Laurence King Publishing, London.
2. Dhamija, J. 1970. Indian Folk Arts and Crafts. New Delhi: National Book Trust India.
3. Henry Glassie. 1995. The Spirit of Folk Art. New York.
4. Hernandez, Jo Farb. 2005. Forms of Tradition in Contemporary Spain. Jackson: University Press of Mississippi and San Jose State University.
5. Parmar, S. 1975. Traditional Folk Media in India. New Delhi: Geka Books.
6. U S Krishna Rao & U K Chandrabagha Devi. A Panorama of Indian Dances.

## **REFERENCE BOOKS:**

1. ChithraMadhavan, History and Culture of Tamil Nadu, D.K. Print World Ltd.
2. Ezhilavan, Folk performing art of Tamil Nadu, Bio Green Books.
3. Krishna, Nanditha, 1998, Folk arts of Tamilnadu: The performing arts, C.P. Ramaswami Aiyar Foundation.
4. S. M. I. Lakshmanan Chettiar, Folklore of Tamil Nadu.
5. S. Simon Jhon, Folk Narratives: Rituals and Performances reflect.
6. U S Krishna Rao & U K Chandrabagha Devi. A Panorama of Indian Dances.

<b>DURATION – ONE MONTH</b>	<b>STREET PLAY</b>	<b>CODE: VASW04</b>
		<b>HRS: 30</b>

**OBJECTIVES:**

To understand concept of street play and its relevance.

**COURSE OUTCOMES (COs)**

On successful completion of the course the students should enrich their knowledge about

**CO1:** Importance of communication.

**CO2:** Analysis of the self and the society.

**CO3:** Concept and story development.

**CO4:** Acting skills.

**CO5:** Concept of street and its relevance.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

<b>DURATION – ONE MONTH</b>	<b>COURSE CODE: VASW04</b>					<b>TITLE OF THE COURSE: STREET PLAY</b>					<b>HOURS :30</b>	<b>CREDITS:</b>
	<b>PROGRAMME OUTCOMES (PO)</b>					<b>PROGRAMME SPECIFIC OUTCOMES (PSO)</b>						
<b>COURSE OUTCOMES (CO)</b>	<b>P01</b>	<b>P02</b>	<b>P03</b>	<b>P04</b>	<b>P05</b>	<b>PS01</b>	<b>PS02</b>	<b>PS03</b>	<b>PS04</b>	<b>PS05</b>		
<b>CO1</b>	5	2	5	3	5	5	4	3	5	5		<b>4.2</b>
<b>CO2</b>	5	3	5	4	5	5	4	3	5	5		<b>4.4</b>
<b>CO3</b>	5	3	5	4	5	5	5	4	4	5		<b>4.5</b>
<b>CO4</b>	4	3	5	3	5	5	3	4	4	4		<b>4</b>
<b>CO5</b>	4	2	4	3	4	5	4	3	4	4		<b>3.7</b>
	<b>Mean Overall Score</b>											<b>4.16</b>

**Result: The Score of this Course is 4.16(Very High)**

<b>Association</b>	<b>1%-20%</b>	<b>21%-40%</b>	<b>41%-60%</b>	<b>61%-80%</b>	<b>81%-100%</b>
<b>Scale</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Interval</b>	<b>0&lt;=rating&lt;=1</b>	<b>1.1&lt;=rating&lt;=2</b>	<b>2.1&lt;=rating&lt;=3</b>	<b>3.1&lt;=rating&lt;=4</b>	<b>4.1&lt;=rating&lt;=5</b>
<b>Rating</b>	<b>Very Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>High</b>	<b>Very High</b>

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome.

## **UNIT I**

Communication: history, definition, functions and types. Nature Components and purposes. Verbal and Nonverbal communication. Public communication and Impact of Communication for social change.

## **UNIT II**

Understanding Self. Strength and weakness; opportunity and threat, SWOT Analysis, goal setting. Analysis of Society: Individual, people and communities issues and challenges.

## **UNIT III**

Understanding the Concept and Story Development: Concept Development - Concept Development and Realization-Concept Generation & Analysis. Creative thinking of concepts and Creative Thinking Techniques. The art of writing: Understanding the audience, context for writing, categories and characteristics of writing.

## **UNIT IV**

Acting Skills: How to observe, act and emote. Understand and develop acting skills. Characterization, guiding principles for evolving effective and credible characters. Audience Analysis, Segmentation, Targeting and Positioning; Audience Research Demographics, Psychographics.

## **UNIT V**

Street Play: Concept, evolution and principles. Street play for Social and political Issues. Strategy, methodology and Recent trends in Street Play. Tools for street play.

### **TEXT BOOKS:**

1. DeVito Joseph A. 2000. Human Communication: The Basic Course, Harper & Row, London.
2. Dwight V.Swain. Creating Characters
3. Robert Hilliard. 1982. Writing for Television and Radio, Hasting House, New York.
4. Stephen W. Littlejohn& Karen A. Foss. 2010. Theories of Human Communication, Waveland Press, Inc., U.S.
5. Thomas S.Kane. The New Oxford Guide to Writing
6. Timothy Gerard. 1997. Writing for Multimedia: Entertainment Education, Training, Advertising and World Wide Web, Focal Press, Oxford.

### **REFERENCE BOOKS:**

1. Charles Bukowsk , 2016, On Writing Paperback, Ecco; Reprint edition
2. Christopher Vogler,2007, The Writers Journey: Mythic Structure for Writers, Michael Wiese Productions.
3. Natalie Goldberg, Writing down the bones: freeing the writer within.
4. Roy Peter Clark, Writing Tools: 55 Essential stages for every writer.
5. Stanly Fish, 2012, How to Write a Sentence: And How to Read One Harper Paperbacks; Reprint edition.
6. Timothy Gerard. 1997. Writing for Multimedia: Entertainment Education, Training, Advertising and World Wide Web, Focal Press, Oxford.

## MODEL QUESTION PAPER FOR VALUE ADDED COURSES

**Hours: 2**

**Max Marks: 50**

### **SECTION - A (10X2=20)**

**Answer ALL Questions**

1. Name any two HSO with human relations approach.
2. List the characteristics of human service organizations.
3. What do you mean by staffing?
4. Define decentralization.
5. What do you mean by induction?
6. Write any two advantages of networking.
7. What do you mean by Data Bank?
8. Define Budget.
9. Expand the following a) SSWB b) FCRA
10. Enlist any two acts for registration of non-government organizations.

### **SECTION - B (5X6=30)**

**Answer ALL Questions**

11. a) Explain in brief the systems theory for social welfare administration.  
(or)  
b) Write briefly about the types of Human Service Organizations.
12. a) Write short notes on the administrative processes planning and organizing.  
(or)  
b) Explain the elements of democratic administration.
13. a) What are the advantages of management by objectives?  
(or)  
b) Write short notes on the following  
i) Public relations      ii) Organizational climate
14. a) Briefly explain budgeting as an essential skill for administration.  
(or)  
b) Write short notes on Grants in Aid.
15. a) Compare and contrast the HSO registered as Trusts and Societies.  
(or)  
b) Explain in brief the functions of Governing Boards and Committees.

<b>I B.Sc Mathematics</b>	<b>ALLIED STATISTICS – I</b>	<b>18SMT101</b>
<b>SEMESTER – I</b>		<b>HRS/WK – 6</b>
<b>ALLIED</b>		<b>CREDIT – 4</b>

**Objective:**

To make the students understand the subject and train the students in mastering the techniques of various applications.

**COURSE OUTCOMES (CO's):**

**CO1:** Understand the Definition, Uses, Merits and demerits, relationship of Location, Dispersion and Skewness

**CO2:** Understand the concept of Probability and its related theorem

**CO3:** Know the concepts of random variables, probability mass and density function

**CO4:** Understand the concept of Mathematical Expectation its properties and Chebychev's inequality

**CO5:** Understand the concept of Correlation and Regression and its uses in various fields.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER-I	COURSE CODE: 18SMT101				COURSE TITLE: ALLIED STATISTICS – I				HOURS: 6	CREDIT: 4
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)				PROGRAMME SPECIFIC OUTCOMES(PSO)				MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4		
CO1	4	4	4	4	4	4	4	4	4	
CO2	5	5	5	5	5	5	5	5	5	
CO3	4	4	4	4	5	5	5	5	4.5	
CO4	4	4	4	4	4	4	4	4	4	
CO5	5	5	5	5	5	5	5	5	5	
Mean Overall Score									4.5	

**Result: The score of this Course is 4.5 (VERY HIGH)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	$0 \leq \text{rating} \leq 1$	$1.1 \leq \text{rating} \leq 2$	$2.1 \leq \text{rating} \leq 3$	$3.1 \leq \text{rating} \leq 4$	$4.1 \leq \text{rating} \leq 5$
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome.

## **UNIT – I**

Measures of Central tendency: Arithmetic Mean, Median, Mode, Harmonic Mean and Geometric Mean. Measures of Dispersion: Range, Quartile Deviation, Mean Deviation, Standard Deviation and Coefficient of Variation. Measures of Skewness: Karl Pearson's coefficient of Skewness and Bowley's coefficient of Skewness.

## **UNIT – II**

Probability: Basic definitions – Axiomatic approach to Probability – Basic theorems on Probability – Addition theorem on probability and related problems . Conditional probability – Multiplication theorem of probability and related problems – Independent events – Pair wise independent events (definition only) –Baye's theorem (only theorem).

## **UNIT – III**

Random Variable – Distribution function and their properties - Discrete random Variable – Probability mass function and simple problems - Continuous random variable – Probability density function - simple problems only.

## **UNIT – IV**

Mathematical Expectations: Properties of Expectations – Variance, Covariance and their properties. Moment generating function – Characteristics function - Cumulants – Chebychev's inequality (only theorem).

## **UNIT –V**

Correlation: Scatter diagram, Karl Pearson's Coefficient of correlation, Spearman's rank correlation-Partial and Multiple correlations (3variables only). Regression analysis: Simple regression equations.

## **TEXT BOOKS:**

1. "Fundamentals of Mathematical Statistics"(11<sup>th</sup> edition–2002), Gupta.S.C. and Kapoor.V.K., Sultan Chand & Sons, New Delhi.
2. "Statistical Methods" (32<sup>nd</sup> edition - 2004), Gupta. S. P., Sultan Chand & Sons, New Delhi.

## **REFERENCE BOOKS:**

1. "Mathematical Statistics" (1<sup>st</sup> edition – 2002), Vittal. P. R., Margham Publications, Chennai-17.
2. "Introduction to Probability and Statistics" (2<sup>nd</sup> edition – 1939), Vijay Rohatgi. K. and Ehsanes Saleh. A.K., John Wiley & Sons, Inc., New York.
3. "Introduction to Theory of Statistics" (3<sup>rd</sup> edition - 2001), Alexander M. Mood, Franklin A. Graybill and Duance C Boes, Tata McGraw Hill Publishing Company Ltd., New Delhi.
4. "Fundamentals of Statistics – Volume II" (6<sup>th</sup> edition - 1990), Goon. A. M., Gupta. M. K. and Dass Gupta. B, The World Press Private Ltd., Calcutta.

<b>I B.Sc Mathematics</b>	<b>ALLIED STATISTICS – II</b>	<b>18SMT202</b>
<b>SEMESTER – II</b>		<b>HRS/WK – 6</b>
<b>ALLIED</b>		<b>CREDIT – 4</b>

**Objective:**

To motivate the students to apply the statistical techniques in their respective major subjects and make the students to understand the subject.

**COURSE OUTCOMES (CO's):**

- CO1:** Understand the Discrete distribution & definition, derivation of Mean and variance for each distribution and its moment generating functions
- CO2:** Understand the Continuous distribution and definition, derivation of Mean and variance for each distribution, concept of sampling distribution and its relationship
- CO3:** Know the concept of tests of significance (small sample) test and how to apply in real life situation
- CO4:** Understand the concept of large sample test and its proportion, mean and Standard deviation of correlation coefficients
- CO5:** Understand the concept of Analysis of variance and its uses, whereas learn how to classify and analyze the problems in various fields

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER-I	COURSE CODE: 18SMT202				COURSE TITLE: ALLIED STATISTICS – II				HOURS: 6	CREDIT: 4
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)				PROGRAMME SPECIFIC OUTCOMES(PSO)				MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4		
CO1	4	4	4	4	4	4	4	4	4	
CO2	5	5	5	5	5	5	5	5	5	
CO3	4	4	4	4	5	5	5	5	4.5	
CO4	4	4	4	4	4	4	4	4	4	
CO5	5	5	5	5	5	5	5	5	5	
Mean Overall Score									4.5	

**Result: The score of this Course is 4.5 (VERY HIGH)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome.

### **UNIT – I**

Discrete distributions: Binomial distribution, Poisson distribution and Geometric distribution – Derivations of mean, variance and moment generation functions.

### **UNIT – II**

Continuous distributions: Uniform (mean, variance and m.g.f.), Exponential (mean, variance and m. g. f.) and Normal distributions (m. g. f., characteristics and area problems).

### **UNIT – III**

Tests of Significance for small samples: Students t-test, test for single mean, difference of means, paired observations (dependent sample) and correlation co-efficient. F-test for equality of variances. Chi-Square test for independence of attributes (2x2 table only).

### **UNIT – IV**

Tests of significance for large samples: test for single mean, difference of means, single proportion, difference of proportions, standard deviations, difference of standard deviations and correlation coefficient.

### **UNIT – V**

Analysis of Variance: One way and Twoway classifications. Design of experiments: CRD, RBD and LSD.

### **TEXT BOOKS:**

1. “Fundamentals of Mathematical Statistics” (11<sup>th</sup> edition–2002), Gupta.S.C. and Kapoor. V.K., Sultan Chand & Sons, New Delhi.
2. “Statistical Methods” (32<sup>nd</sup> edition - 2004), Gupta. S.P., Sultan Chand & Sons, New Delhi.
3. “Fundamentals of Applied Statistics” (2<sup>nd</sup> edition – 1978), Gupta. S. C. and Kapoor.V.K., Sultan Chand & Sons, New Delhi.

### **REFERENCE BOOKS:**

1. “Mathematical Statistics” (1<sup>st</sup> edition – 2002), Vittal. P. R., Margham Publications, Chennai - 17
2. “Introduction to Probability and Statistics” (2<sup>nd</sup> edition – 1939), Vijay Rohatgi. K. and Ehsanes Saleh. A.K., John Wiley & Sons, Inc., New York.
3. “Introduction to Theory of Statistics” (3<sup>rd</sup> edition - 2001), Alexander M. Mood, Franklin A. Graybill and Duance C Boes, Tata McGraw Hill Publishing Company Ltd., New Delhi.
4. “Fundamentals of Statistics – Volume II” (6<sup>th</sup> edition - 1990), Goon. A. M., Gupta. M. K. and Dass Gupta. B, The World Press Private Ltd., Calcutta.



<b>I B.Sc Mathematics</b>	<b>ALLIED STATISTICS PRACTICAL</b>	<b>18SMP201</b>
<b>SEMESTER – I &amp; II</b>		<b>HRS/WK – 2</b>
<b>ALLIED</b>		<b>CREDIT – 2</b>

**Objective :**

To train the students in mastering the techniques of various statistical applications.

**COURSE OUTCOMES(CO's):**

**CO1:** Understand how to solve measures of Location, Dispersion, Skewness and Kurtosis problems

**CO2:** Understand how to solve Correlation and two regression equations

**CO3:** Set up the hypothesis for small sample test problems and goodness of fit

**CO4:** Set up the hypothesis for large sample test problems and its mean, proportions

**CO5:** Solve and analyse One way, Two way classifications, CRD, RBD and LSD.

**Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

SEMESTER-I	COURSE CODE: 18SMP201				COURSE TITLE: ALLIED STATISTICS PRACTICAL				HOURS:2	CREDIT:2
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)				PROGRAMME SPECIFIC OUTCOMES(PSO)				MEAN SCORE OF CO'S	
	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4		
CO1	4	4	4	4	4	4	4	4	4	
CO2	5	5	5	5	5	5	5	5	5	
CO3	4	4	4	4	5	5	5	5	4.5	
CO4	4	4	4	4	4	4	4	4	4	
CO5	5	5	5	5	5	5	5	5	5	
Mean Overall Score									4.5	

**Result: The score of this Course is 4.5 (VERY HIGH)**

Association	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%
Scale	1	2	3	4	5
Interval	0<=rating<=1	1.1<=rating<=2	2.1<=rating<=3	3.1<=rating<=4	4.1<=rating<=5
Rating	Very Poor	Poor	Moderate	High	Very High

This Course is having **VERY HIGH** association with Programme Outcome and Programme Specific Outcome.

## **UNIT – I**

### **Measures of Central tendency**

1. Computation of Arithmetic Mean
2. Computation of Median
3. Computation of Mode
4. Computation of Harmonic Mean
5. Computation of Geometric Mean

### **Measures of Dispersion**

1. Computation of Quartile Deviation
2. Computation of Mean Deviation from Mean
3. Computation of Mean Deviation from Median
4. Computation of Standard Deviation
5. Computation of Combined Standard deviation (maximum 3 variables)
6. Computation of Coefficient of Variation

### **Measures of Skewness**

1. Computation of Karl Pearson's coefficient of Skewness
2. Computation of Bowley's coefficient of Skewness

## **UNIT – II**

### **Correlation analysis**

1. Computation of Karl-Pearson's Correlation coefficient
2. Computation of Spearman's rank Correlation coefficient
3. Computation of Spearman's rank Correlation coefficient (Repeated ranks)

### **Regression analysis**

1. Computation of Simple Regression equations

## **UNIT – III**

### **Fitting of distributions**

1. Fitting of Binomial distribution
2. Fitting of Binomial distribution
3. Fitting of Poisson distribution
4. Fitting of Normal distributions (Area Method)

### **Test of Significance**

1. Small sample test for single mean
2. Small sample test for difference of means
3. Paired t-test (paired samples)
4. Small sample test for single variance ( $\chi^2$  - test)
5. Small sample test for difference of variances (F-test)
6. Small sample test for correlation coefficient

## **UNIT – IV**

### **Test of Significance**

1. Large sample test for single mean
2. Large sample test for difference of means
3. Large sample test for single proportion

4. Large sample test for difference of proportions
5. Large sample test for standard deviations
6. Large sample test for difference of standard deviations
13. Large sample test for correlation coefficient
14.  $\chi^2$  - test for goodness of fit and independence of attributes

#### **UNIT –V**

##### **Analysis of Variance**

1. One way classification
2. Two way classification

##### **Design of Experiments**

1. Analysis of Completely Randomized Design
2. Analysis of Randomized Block Design
3. Analysis of Latin Square Design

#### **TEXT BOOKS:**

1. “Statistical Methods” (32<sup>nd</sup> edition - 2004), Gupta. S. P., Sultan Chand & Sons, New Delhi.
2. “Fundamentals of Applied Statistics” (2<sup>nd</sup> edition – 1978), Gupta. S. C. and Kapoor. V.K., Sultan Chand & Sons, New Delhi.

#### **REFERENCE BOOKS:**

1. “Mathematical Statistics” (1<sup>st</sup> edition – 2002) Vittal. P. R., Margham Publications, Chennai - 17
2. “Introduction to Probability and Statistics” (2<sup>nd</sup> edition – 1939), Vijay Rohatgi. K. and Ehsanes Saleh. A.K., John Wiley & Sons, Inc., New York.
3. “Introduction to Theory of Statistics” (3<sup>rd</sup> edition - 2001), Alexander M. Mood, Franklin A. Graybill and Duance C Boes , Tata McGraw Hill Publishing Company Ltd., New Delhi.
4. “Fundamentals of Statistics – Volume II” (6<sup>th</sup> edition - 1990), Goon. A. M., Gupta. M.K. and Dass Gupta. B, The World Press Private Ltd., Calcutta.