E-mail : josecol27998@gmail.com
Website: www.sjctnc.edu.in

IMPLEMENTATION OF STATED CODE OF ETHICS FOR RESEARCH

RESEARCH ETHICS IN SYLLABUS

PG II YEAR	ஆராய்ச்சி நெறிமுறைகள் (Research Methodology) இரண்டாம் ஆண்டு (M.A. Tamil)	20PTA32A
SEMESTER – IV		HRS/WEEK – 6
Main – II		CREDIT – 5

நோக்கம்:

1. ஆராய்ச்சிநெறிமுறைகள் மற்றும் ஆய்வாளர்க்குரியதகுதிகள் பற்றிகற்பித்தல்.
2. ஆராய்ச்சியின் வகைகளையும் கோட்பாடுகளையும்கற்பித்தல்
3. ஆய்வேட்டின் அமைப்புவரைவுமுறைப்பற்றிக் கற்றுக் கொடுத்தல்.

பயன்கள்:

1. ஆய்வாளர்குரியதகுதிகளைஅறிவர்.
2. ஆராய்ச்சியின் வகைகளையும் கோட்பாடுகளையும் அறிவர்.
3. ஆய்வேட்டின் அமைப்புவடிவங்களைஅறிவர்.

CO1: ஆராய்ச்சிநெறிமுறைகள் விளக்கம்,பொருள்,ஆய்வாளர்க்குரியதகுதிகள், ஆராய்ச்சி வகைகள் ஆய்வுசிக்கல்கள் பற்றிஎடுத்தரைத்தல்.

CO2:ஆய்வின் அடிப்படைநெறிமுறைகள்,ஆய்வுபொருளைதெளிவாகச் சுட்டல், ஆராயப்படவேண்டியவற்றைதெளிவாகஎடுத்துக்கொள்ளுதல் போன்றவற்றை கற்றுத் தருதல்.

CO3: ஆய்வுலகஅடிப்படைக் கோட்பாடுகளில் செய்திகள்,கருத்துகள்,விதி, கொள்கை,அறிவியல் ஆய்வும் கலையியல் ஆய்வும் தெரிந்துகொள்ள செய்தல்.

CO4:ஆய்வேட்டின் அமைப்பும் வரைவுமுறையும் பற்றிதெளிவாகஅறிந்துகொள்ள வைத்தல்.

CO5:தமிழாய்வுபரப்பு,இலக்கியஆய்வுவரலாறு,அகராதி,தமிழியலும்-மொழியிலும், பண்பாட்டியலும், நுண்கலைகளும் பற்றிகற்பித்தல்.

SEMESTER IV	COURSE CODE:20PTA32A					Course Title ஆராய்ச்சிநெறிமுறைகள்				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		
CO1	5	5	5	5	5	5	5	5	5	5	
CO2	5	5	5	5	5	5	5	5	5	5	
CO3	4	4	4	4	4	5	5	5	5	4.5	
CO4	4	4	4	4	4	4	4	4	4	4	
CO5	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	மிகவும் குறைவான	குறைவான	நடுத்தரமான	அதிகமான	மிகவும் அதிகமான

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

பாடங்கள்

அலகு1 :ஆராய்ச்சி : நெறிமுறைகள் விளகக்ம் - ஆராய்ச்சிப் பொருள் - ஆய்வாளர்க்குரியதகுதிகள் - ஆராய்ச்சி வகைகள் - அணுகுமுறைகள் - கருதுகோள் - ஆய்வுச் சிக்கல்கள்.

அலகு2 :ஆய்வின் அடிப்படைநெறிமுறைகள் : ஆய்வுப் பொருளைத் தெளிவாகச் சுட்டல் - ஆய்வுப் பொருள் பற்றி இதுவரைசெய்யப்பட்டஆய்வுகள் - ஆராயப்படவேண்டியன– ஆராயப்படவேண்டுவனவற்றுள் இப்போதுஎடுத்துக் கொள்ளப்படவேண்டியன.

அலகு3 :ஆய்வுலகஅடிப்படைக் கோட்பாடுகள் : செய்திகள்(குயஉவள) - கருத்துகள் - விதி (Law) - கொள்கை (Theory) - வகைப்பாடு (Classification) - கோட்பாடுகள் - அறிவியல் ஆய்வும் - கலையியல் ஆய்வும்.

அலகு4 :ஆய்வேட்டின் அமைப்பும் வரைவுமுறையும் : ஆய்வேட்டின் அமைப்பு - தகவல் திரட்டல் - திட்டமிடுதல் - ஆய்வுமொழிநடை - முதல் படி (First Draft) - திருத்தப்படி (Revised Draft) - அடிக்குறிப்பு (Footnote) - துணைநூற்பட்டியல் (Bibliography) - குறுக்கவிளக்கம் - முனனுரை - முடிவுரை - பரிந்துரை– படங்கள் - அட்டவணைகள் - பொருட்குறிப்புஅகராதி.

அலகு5 :தமிழாய்வுப் பரப்பு - இலக்கியஆய்வு - ஒப்பிலக்கியஆய்வு - இலக்கியவரலாற்றுஆய்வு - இலக்கணஆய்வுமொழிவரலாற்றுஆய்வு - அகராதிஆய்வு - தமிழியலும் மொழியியலும் - தமிழியலும் பண்பாட்டியலும் - தமிழியலும் நுண்கலைகளும் - தமிழியலும் உளவியலும் - தமிழியலும் தொல்பொருள் அகராதி.

பார்வைநூல்கள் :

1. டாக்டர் ச.வே. சுப்பிரமணியன் : ஆராய்ச்சிநெறிமுறைகள், (ப.ஆ)உலகத் தமிழாராய்ச்சிநிறுவனம்,தரமணி,சென்னை, 1975.

2. டாக்டர் ஈ.சா. விசுவநாதன்:ஆய்வுநெறிமுறைகள்,தமிழ்ப்புத்தகாலயம், சென்னை, 1986.

3. டாக்டர் முத்துச்சண்முகம் : ஆய்வுக்கட்டுரைஎழுதும் முறை,டாக்டர் சு.வேங்கடராமன் முத்துப்பதிப்பகம்,மதுரை, 1979.

4. டாக்டர் பொற்கோ : ஆராய்ச்சிநெறிமுறைகள்,ஐந்திணைப் பதிப்பகம்,279,பாரதிசாலை,திருவலலிக்கேணி,சென்னை– 5,2005.

5. டாக்டர் என். கணேசன் :ஆய்வியல் கோட்பாடுகளும் செயல்முறைகளும்,பயோனியர் புக் சர்வஸ்,சென்னை - 5, 1991.

II M.Sc. Physics

II – M. Sc. (PH)	**RESEARCH METHODOLOGY, COMPUTATION METHODS & PROGRAMMING**	**18EPPH42**
SEMESTER - IV		**HRS/WK - 5**
ELECTIVE – IV A		**CREDIT - 3**

OBJECTIVES:

To know about the principles of Scientific research and learn about research writing, computational methods and programming used in research.

COURSE OUTCOMES:

CO1: To understand the Principles of Scientific Research
CO2: To Understand Qualitative & Quantitative Analysis
CO3: Understanding the Plotting& Analyzing Origin
CO4: To Learn the Programming using MATLAB
CO5: To study the Python Programming

Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes

SEMESTER – IV	**COURSE CODE: 18EPPH42**					**COURSE TITLE: RESEARCH METHODOLOGY, COMPUTATION METHODS & PROGRAMMING**						**Hours:5**	**Credit:3**
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	1.1	4.1	1.2	3.3	1.0	4.2	4.2	4.1	4.3	4.3	1.0	2.98	
CO2	1.0	3.3	1.0	3.2	1.0	4.2	4.1	4.2	4.3	4.3	1.0	2.87	
CO3	1.0	3.4	1.0	3.6	1.1	4.4	4.4	4.6	4.4	4.5	1.1	2.65	
CO4	1.1	3.3	1.0	3.5	1.0	4.4	4.8	4.1	4.2	4.2	1.0	2.87	
CO5	1.0	4.0	1.1	3.2	1.0	4.3	4.3	4.1	1.0	4.4	1.1	2.68	
Mean Overall Score												2.81	

Result: The Score for this course is 2.81 (Moderate)

Association	**1-20%**	**21-40%**	**41-60%**	**61-80%**	**81-100%**
Scale	**1**	**2**	**3**	**4**	**5**
Interval	**0.0-1.0**	**1.1-2.0**	**2.1-3.0**	**3.1-4.0**	**4.1-5.0**
Rating	**Very Poor**	**Poor**	**Moderate**	**High**	**Very High**

This course is having **Moderate** association with Programme Outcome and Programme Specific Outcome.

UNIT - I **(15 Hours)**

Principles of Scientific Research: Identification of the problem- Literature survey – Reference collection – Familiarity with ideas and concept of investigation –Internet Browsing –Drawing inference from data

UNIT - II **(15 Hours)**

Analysis and Research Writing: Art of writing a research paper, Synopsis, Research Project and Thesis - Seminar -Power point presentation.

UNIT - III **(15 Hours)**

Origin Graphing and Analysis: Linear curve fitting - non-linear curve fitting - model validation - dataset comparison tools - multi-dimensional data analysis- Peak Analysis

UNIT – IV **(15 Hours)**

Starting with MATLAB, Creating Arrays: Starting with MATLAB, MATLAB Windows – Working in the Command windows –Arithmetic Operations with Scalars – Display formats – Elementary Math Built in functions –Defining Scalar Variable – Creating one dimensional arrays and creating two dimensional arrays.

UNIT – V **(15 Hours)**

Python Programming Environment: Fundamental python programming techniques such as lambdas, reading and manipulating csv files, and the numpy library - Data manipulation and cleaning techniques

TEXT BOOK:

1. Research Methodology – Methods and Techniques (Third Edition) C.R. Kothari and G. Garg 1990

REFERENCE BOOKS:

1. NekaneGuarrotxena, Research Methodology in Physics and Chemistry of Surfaces and Interfaces. 2014

III B.Sc. BIOCHEMISTRY

III B.Sc. (Biochemistry)	**RESEARCH METHODOLOGY & BIOSTATISTICS**	**COURSE CODE: EBC64A**
SEMESTER-VI		**HRS/WK-5**
ELECTIVE-IV		**CREDIT-4**

OBJECTIVES:

1. To provide sufficient background to interpret statistical results in research papers.
2. To ensure the students with requisite knowledge to pursue a career in the clinical research industry.

COURSE OUTCOMES:

CO1: To understand the basic concepts of scientific research & preparation of manuscript

CO2: To gain appropriate knowledge about research problem, research design & reference styles

CO3: To acquire in-depth knowledge about the collection & diagrammatic reperentatiomn of data.

CO4: To understand and gain insight knowledge about measures of central tendency & correlation, regression & student t-test.

CO5: To gain knowledge about the bioethics and patenting

SEMESTERVI	COURSE CODE: EBC64A					RESEARCH METHODOLOGY & BIOSTATISTICS								HOURS: 5 CREDITS:4
COURSE OUTCOMES	PROGRAMME OUTCOMES(POS)					PROGRAMME SPECIFIC OUTCOMES(PSOS)								MEAN SCORE OF CO'S
	PO 1	PO 2	PO 3	PO 4	PO 5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	
CO1	3	3	4	3	3	2	4	4	3	3	4	4	5	3.5
CO2	4	2	2	3	3	3	4	3	4	5	3	3	4	3.3
CO3	3	2	4	3	2	3	4	4	4	3	4	3	4	3.3
CO4	4	4	3	5	2	2	4	3	5	3	2	4	4	3.5
CO5	4	3	2	5	2	3	4	2	3	3	4	2	3	3.1
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 - SCIENTIFIC RESEARCH [15 hrs]

Research definition, importance & need for research ethics, selection of topic, review of literature, preparation of manuscript, scientific writing, features of abstract, mode of collection of literature, abstracting and indexing journals.

UNIT II - RESEARCH PROBLEM [15 hrs]

Research problem -components of research problem, formulation of research problem, Research Design - Classification of research designs, need for research design, features of good research design, experimental research design- References-Vancouver and Harvard system.

UNIT III - DATA COLLECTION AND PRESENTATION [15hrs]

Introduction: Collection of data, primary data, secondary data, methods of data collection. Processing of data- classification and tabulation of statistical data, Frequency Distribution: Simple and Cumulative, Diagrammatic presentation of data - Histogram, Bar chart, Frequency polygon and Pie chart, graphical presentation of data- line graph.

UNIT IV - MEASURES OF CENTRAL TENDENCY [15 hrs]

Measurement of Central Value: Mean, Median, Mode, Geometric Mean (G.M) and Harmonic Mean (H.M), Measures of Dispersion: Range, Quartile deviation, Mean deviation, Standard deviation. Test for correlation and regression coefficients, Student t test, Chi-square test. F-test ANOVA – one way classification.

UNIT V - BIOETHICS AND PATENTING [15hrs]

Ethics in animal experimentation and overview about other bioethics .CPCSEA guidelines - Animal care, feed, bedding, water, sanitation and cleanliness, waste disposal, anesthesia and euthanasia. Ethics in food and drug safety. Patenting - definition of patent. Product and process patent. Procedure for patent drafting.

TEXT BOOKS

1. Green. R. H. 1979. 'Sampling Design and Statistical Methods for Environmental Biologists' .John Wiley & Sons.
2. Gupta.S.C& Kapoor. 1978.V.K. "Fundamental of Applied Statistics" (2nded), MJP Publishers.

REFERENCE BOOKS:

1. Thomas Glover, Kevin Mitchell.2001.' Introduction to Biostatistics', 1st ed. McGraw Hill Science
2. Dr N .Gurumani,2015. "An Introduction to Biostatistics",MJP Publishers
3. Wilson & Walker, 2000. Principles and Techniques in Practical Biochemistry' 5th ed.. Cambridge Univ. Press.
4. Clinical Research Practice and prospects-T.K.Pal,Sangita Agarwal,1st edition.
5. Essential of Medical Pharmacology, Sixth edition-KD.Thripathi MD, Jaypee brothers medical publishers (P) Ltd. St Louis (USA).
6. Green. R. H. 1979. 'Sampling Design and Statistical Methods for Environmental Biologists' .John Wiley & Sons.
7. Dr.A.WilsonAruni,Dr.P.Ramadass "Research and writing: Across the disciplines", MJP Publishers

8. Gupta.S.C&Kapoor. V.K. 1978. “Fundamental of Applied Statistics” (2nded) ,MJP Publishers
9. Ethics and the use of alternatives to animals in research and education, ShiraneePereira, CPCSEA.
10. CPCSEA guidelines for laboratory animal facility (CPCSEA) - No.13 Seaward road, Valmiki Nagar, Chennai-41.

II M.Sc. BIOCHEMISTRY

II M.Sc. (Biochemistry)	**RESEARCH METHODOLOGY & BIOSTATISTICS**	**COURSE CODE: PBC42A**
SEMESTER-IV		**HRS/WK-5**
CORE -12		**CREDIT-4**

OBJECTIVES:

1. To provide knowledge and skills to understand the role of statistics in research.

2. To develop skill in scientific writing and recent techniques.

3. To provide sufficient background to interpret statistical results in research papers

COURSE OUTCOMES

CO1: To understand the basic concepts of scientific research, research process, research design and reference system.

CO2: To gain appropriate knowledge about sample collection, hypothesis testing analysis, tabulation of statistical data apart from measures of central tendency and averages.

CO3: To acquire in-depth knowledge about the statistical analysis and Six sigma and Minitab.

CO4: To understand and gain insight knowledge about bioethics and patenting.

CO5: To gain knowledge about the GLP, GMP, biosafety practices & Bioethics

SEMESTER IV	COURSECODE: PBC42A					RESEARCH METHODOLOGY & BIOSTATISTICS								HOURS: 5 CREDITS:4
COURSE OUTCOMES	PROGRAMME OUTCOMES (POS)					PROGRAMME SPECIFIC OUTCOMES (PSOS)								MEAN SCORE OF CO'S
	PO 1	PO 2	PO 3	PO 4	PO 5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	
CO1	4	5	3	4	4	3	4	3	4	4	4	3	4	3.8
CO2	3	4	4	3	5	4	5	4	3	5	3	4	3	3.8
CO3	4	4	3	4	3	4	4	2	3	4	4	4	3	3.6
CO4	3	3	2	3	4	3	3	3	4	4	3	3	4	3.2
CO5	4	4	3	4	4	4	4	3	4	5	4	2	3	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 - SCIENTIFIC RESEARCH [15 hrs]

Research definition, importance & need for research ethics, selection of topic, review of literature, preparation of manuscript, scientific writing, features of abstract, mode of collection of literature, journals, conference proceedings, abstracting and indexing journals. Research design. References -Vancouver and Harvard system.

UNIT II - DATA COLLECTION AND PRESENTATION [15 hrs]

Collection and classification of data - diagrammatic and graphical representation of data.Tabulation of statistical data-Frequency Distribution-Simple and Cumulative. Displaying data-Histogram, Bar chart, Frequency polygon, Pie chart, less than & more than Ogives. Measures of Central tendency. Mean (arithmetic, harmonic & geometric) median and mode. Measure of Averages – Mean, Median and mode.

UNIT III - STATISTICAL ANALYSIS [15 hrs]

Measures of Dispersion for biological characters – Quartile Deviation, Mean Deviation and Standard deviation. Correlation & regression Co-efficient, levels of significance, Student t test, Chi square test. F test for equality of variances, Six sigma and Minitab, ANOVA –one way classification.

UNIT IV - BIOETHICS AND PATENTING [15hrs]

Ethics in animal experimentation and overview about other bioethics. CPCSEA guidelines - Animal care, feed, bedding, water, sanitation and cleanliness, waste disposal, anesthesia and euthanasia. Ethics in food and drug safety. Guidelines for human ethics. Patenting - definition of patent. Product and process patent. Procedure for patent drafting.

UNIT V - GLP, GMP & Bioethics [15 hrs]

Good laboratory practices - fundamental points of GLP,OECD GLP Principles,WHO guidelines on GLP and GMP. Documentation errors, good documentation practice. Prudent biosafety practices in laboratory and recommended biosafety levels for infectious agents. **Bioethics:** Bioethical issues related to Healthcare & Medicine.

TEXT BOOKS:

1. Green. R. H. 1979. 'Sampling Design and Statistical Methods for Environmental Biologists' .John Wiley & Sons.
2. Dr.A.WilsonAruni,Dr.P.Ramadass "Research and writing: Across the disciplines", MJP Publishers

3. Gupta.S.C&Kapoor. V.K. 1978. “Fundamental of Applied Statistics” (2nd ed) ,MJP Publishers
4. Ethics and the use of alternatives to animals in research and education, ShiraneePereira, CPCSEA.
5. CPCSEA guidelines for laboratory animal facility (CPCSEA) - No.13 Seaward road, Valmiki Nagar, Chennai-41.
6. Ethical guidelines for biomedical research on human subjects.2000. ICMR, New Delhi.
7. Wayne W, Daniel 2006, biostatistics: a foundation for analysis in the health sciences (9thedition), John Willey and Sons Inc., USA.
8. Upadhyay, Upadhyay and Nath,1997. Biophysical Chemistry- Principles and Techniques’ Himalaya Publ.

REFERENCE BOOKS

1. Dr.G.Vijayalashmi, Dr.C.Sivapragasam “Research methods: Tips and Techniques”,MJP Publishers
2. Matthews,2001.Sucessful Scientific writing: A step-by step guide for Biomedical Scientists’. 2nd ed. Cambridge University Press
3. Thomas Glover, Kevin Mitchell.,2001. Introduction to Biostatistics’, 1st ed. McGraw Hill Science4. Dr N .Gurumani, “An Introduction to Biostatistics”,MJP Publishers
4. Dr N .Gurumani, “Thesis writing and paper presentation”, MJP Publishers
5. Pavia et al.2000. Introduction to Spectroscopy’, 3rd ed. Brooks/Cole Pub Co.

II M.Sc. MICROBIOLOGY

YEAR – I	RESEARCH METHODOLOGY (For those students admitted in the year 2021 – 22 and onwards)	21EPM25A
SEMESTER - II		HRS / WK - 3
Elective – III A		CREDIT - 2

Objective: To make the students understand the concept behind designing the research, data collection and data analysis using statistical methods.

Course Outcomes:

Upon successful completion of the course, the student:

CO1: Acquires knowledge about Research and Experimental designs

CO2: Becomes familiar with Citation and Impact factor

CO3: Learns about preparing Research Report

CO4: Understands the role of committees in biological research

CO5: Gains knowledge about General Laboratory Procedures

SEMESTER: II	COURSE CODE: 21EPM25A				COURSE TITLE: RESEARCH METHODOLOGY				HOURS: 3	CREDITS: 2
COURSE OUTCOMES	PROGRAMME OUTCOMES (PO)				PROGRAMME SPECIFIC OUTCOMES (PSO)				MEAN SCORE OF COs	
	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4		
CO1	4	3.5	4	3.5	4	4	4	4	3.87	
CO2	3.5	3.5	4	4	4	3.5	3.5	4	3.75	
CO3	4	3.5	4	4	3.5	4	4	4	3.56	
CO4	3	3.5	3.5	4	4	3	3	3.5	3.87	
CO5	3.5	3.5	3.5	3.5	4	3.5	3	3.5	3.50	
Mean Overall Score									3.71	

Result: The score of this course is 3.71 (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 **(9 Hrs)**

Research – Definition – Experimental designs - Identification, Selection and formulation of research problem – Research questions – Research Hypothesis.

Unit 2 **(9 Hrs)**

Literature Collection – Literature Citation - Major search engines - Major Websites, book and scientific information – Journals – Impact factor.

Unit 3 **(9 Hrs)**

Research Report – Components of a Research Report – Authors and Addresses – Abstract – Synopsis – Key words – Introduction – Materials and Methods – Results – Discussion – Acknowledgements – Summary and Conclusions – Appendixes – References - Title – Tables – Figures – Formatting and Typing.

Unit 4 **(9 Hrs)**

Biological research - Institutional Ethical committee – Animal ethical committee – Use of laboratory animals in research - Laboratory animal management.

Unit 5 **(9 Hrs)**

General Laboratory Procedures – pH, Buffers, Electrodes and Biosensors – Estimation of Carbohydrates (Bradford Method) – Protein (Lowry Method) – Lipid (Soxlet Method) – Nucleic Acid (Spectrophotometry) – Techniques for Sample Preparation.

Text Books

1. Research Methodology: For Biological Sciences. Dr. N. Gurumani. 2006, MJP Publishers.
2. Biophysical Chemistry Principles and Techniques. Upadhyay, Upadhyay and Nath. 1997. Himalaya Publications.

Reference Books

1. Y. K. Singh and R. B. Bajpai, Research Methodology Data Presentation, 2008. APH Publishing Corporation, New Delhi**.**
2. Modern Experimental Biochemistry. 3rd Edition, 2000. Rodney Boyer. Addison Wesley Longman, Inc.
3. A Biologists guide to Principles and Techniques of Practical Biochemistry. 5th Edition, 2000. Wilson and Walker. Cambridge University Press.
4. Physical Biochemistry. 2nd Edition, 1982. David Freifelder. W. H. Freeman and Company, New York.

II M.Sc. COMPUTER SCIENCE

II M.SC (CS)	**RESEARCH METHODOLOGY**	**EPCS915A**
SEMESTER – III		**HRS/WK – 4**
ELECTIVE – 4A		**CREDIT – 3**

Objective:

To enable student to understand and work with methods and concepts related to Research andalso to develop broad comprehension of research area

COURSE OUTCOMES (COs):

CO1: Understand and acquire the basics knowledge about research methodology andthe research design concepts.
CO2: Understand the various data collection methods for doing research.
CO3: Knowledge about data analysis methods and its usage.
CO4: Understand the usage and significance of report writing and its techniques.
CO5: Understand about the importance of writing and presentation of research report.

Relationship Matrix Course Outcome, Programme Outcome and Programme Specific Outcome

SEMESTER III	COURSE CODE: EPCS915A					COURSE TITLE: RESEARCH METHODS					HOURS: 4	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	3	3	4	4	4	3	4	4	3	3	3.5	
CO2	4	4	3	3	3	4	4	4	3	4	3.6	
CO3	3	4	4	3	3	4	4	4	3	4	3.6	
CO4	4	4	3	3	3	3	4	4	3	4	3.5	
CO5	3	4	3	4	4	4	3	3	4	4	3.6	
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 SpecificOutcome

UNIT-I [12Hrs]

BASICS OF RESEARCH METHODOLOGY: An introduction – Meaning of Research –Objectives of Research – Motivation in Research – Types of Research – Research Approaches– Significance of Research – Research methods versus methodology.

UNIT-II [11Hrs]

RESEARCH DESIGN: Meaning –needs – features – Important topics related to ResearchDesign-Types-Principles.

Sample Design: Steps – Criteria for selecting a sample design – criteria for good sampledesign.

UNIT-III [13Hrs]

DATA COLLECTION:

Methods of Data Collection – Collection of primary data – Collectionof data through questionnaires – Schedules – Differentiation between questionnaires and schedules – Other methods of data collection – Collection of secondary data – Selection of appropriate method for data collection– Data Collection using Journals.

UNIT-IV [12Hrs]

ANALYZING OF DATA:

Processing operations - Some Problems in Processing -Elements/Types of Analysis - Statistics in Research - Measures of Central Tendency -Measures of Dispersion - Measures of Relationship -Simple Regression Analysis -Multiple Correlationand Regression - Partial Correlation.

UNIT-V [12Hrs]

SIGNIFICANCE OF REPORT WRITING– Different steps in writing Report – Layout of the Research Report – Types of Reports – Oral presentation – Mechanics of writing a Research Report – Precautions for writing a Research Reports – Conclusions.

TEXT BOOK:

1. "Research Methodology – Methods and Techniques", C.R. Kothari (2nd Edition), NewDelhi, New Age International (P) Limited, 2003.

REFERENCES BOOK:

1. "Qualitative Research in IS: Issues & Trends", Eileen M. Trauth,USA/London, IDEA Group Publishing, 2001. (ISBN: 1-930708-06-08)

II M.Com. COMMERCE

II–M.COM	**RESEARCH METHODOLOGY**	**PCM912Q**
SEMESTER-III		**HRS/WK-6**
CORE-X		**CREDIT-5**

Objectives:

1. To impart the students with knowledge in exposing in the field of research by both theoretical and practical.
2. To equip students to Apply Appropriate Research design, Sampling Techniques and Statistical tools in research

Course Outcomes:

At the end of the Course the students should be able to exhibit: CO1: Understand the basic concepts of research.
CO2: Familiar with formulation research design and framing Suitable hypothesis.
CO3: Comprehend the sampling survey and sampling procedures.
CO4: Use suitable methods for Data collection and apply different statistical tools.
CO5: Use dynamic methods in Interpreting and writing there search report.

Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes.

SEMESTER–III	COURSECODE:PCM912Q					COURSETITLE:RESEARCH METHODOLOGY					HOURS:6	CREDITS:5
COURSE OUTCOMES	PROGRAMME OUTCOMES(PO)					PROGRAMME SPECIFI COUT COMES (PSO)					MEANS CORE OF CO'S	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	5	5	5	5	4	4	5	3	3	3	4.2	
CO2	5	5	5	5	4	4	5	3	3	2	4.1	
CO3	5	5	5	5	4	4	5	3	3	2	4.1	
CO4	5	5	5	4	5	4	5	4	4	2	4.3	
CO5	5	5	5	4	5	4	5	4	4	2	4.3	
	Mean Overall Score										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 Outcome and Programme Specific Outcome.

UNIT – I Introduction to Research and Methods (20Hrs)

Research –Meaning and Definition- Types of Research – Research Methods – Problems faced by Researcher – Research Process _ Various Steps in Research Process. Review of literature– Identification Research Gap – social relevance of research – Research Problem – Sources, Identification and Developing Research Problem – Construction of Research Questions – Framing Objectives and hypotheses.

UNIT–II Research Design (20Hrs)

Concepts– Meaning, Definition and types-Variables–Meaning& Definition–Types of Variables**.** Research Design-Meaning, Definition- types of Research Design–Experimental And non-Experimental Research Design–Characteristic of good Research Design– Relationship between Research Problem and Research Design.

UNIT –III Sampling Design and Data Collection (15Hrs)

Sample– meaning and definition-sample size-sampling design– meaning and definition-essentialsofgoodsamplingdesign-methodsofsampling-randomandnon-random sampling-sampling and non- sampling error- reduction of sampling errors. Data- types of data- primary data- different methods of collecting primary data- measurement of scale and scaling techniques- construction of questionnaire- secondary data- various sources of secondary data.

UNIT–IV Data analysis (20Hrs)

Steps in processing the data – editing- coding- classification- content analysis- tabulation-methods of tabulation. Application of statistics in data analysis- descriptive statistics- mean, median, mode, standard deviation- correlation and regression- inferential statistics- chi- square test- ANNOVA, T- test-,F-Test- tools for testing hypothesis. Application of computer in modern research.

UNIT–V Report writing (15Hrs)

Research report- meaning-, types of research report- essential of good research report- stages in preparing research report- structure of research report- preliminary pages, main body of the report and reference material- guidelines and mechanics for preparing research report.

TEXTBOOKS:

1. Kothari. C.R. – *"Research Methodology – Methods and Technology"* New age international publisher, New Delhi,2019.
2. P. Saravanavel. *Research Methodology*. Margam Publication, Chennai.

REFERENCEBOOKS:

1. Paneerselvam. R.-*"Research Methodology "*Prentice Hall of India,NewDelhi,2014.
2. Krishnaswami. O.R.–*"Methodology o Research in Social Sciences* "Himalaya Publishing House, Mumbai,2018.
3. Dr. D. Amarchand,(2000) Research Methods in Commerce, Emerald Publications, Chennai.
4. Research methodology R.M.C. murthyvrinda publication Delhi 2019.

WEB REFERENCES:

1. https://www.google.com/url?q=https://www.researchgate.net/(unit-1)
2. https://www.google.com/url?q=https://www.researchgate.net/profile/(unit-2)
3. https://www.google.com/url?q=https://www.slideshare.net/(unit-2)

4. https://www.google.com/url?q=https://www.scribd.com/(unit-3)
5. .https://www.google.com/url?q=https://www.sherrytowers.com/(unit-4)
6. https://www.google.com/url?q=https://www.researchgate.net/(unit-5)
7. https://www.google.com/url?q=https://www.researchgate.net/(unit-5)

III B.Com. BANK MANAGEMENT

III BBM	RESEARCH METHODOLOGY	CODE - 21EBM506
SEM V		HRS/WEEK – 5
DISCIPLINE SPECIFIC ELECTIVE-II(A)		CREDIT – 4

Course Outcomes:
At the end of the Course the students should be able to
CO1: Understand the fundamental concepts of Auditing.

CO2: Be able to create a Structure Audit Planning and Programme.

CO3: Learn how to verify and value Assets and Liabilities.

CO4: Know the statutory rights, Duties, Role and Qualification of Auditor.

CO5: Familiarize with the EDP based environment.

SEMESTER I	COURSE CODE: 21EBM506					TITLE OF THE PAPER: RESEARCH METHODOLOGY								HOURS:5	CREDITS: 4
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	5	4	5	4	4	4	5	4	4	5	4.2	
CO2	5	5	4	4	5	5	5	5	4	5	4	4	5	4.6	
CO3	5	4	3	4	5	5	5	5	5	4	4	4	5	4.4	
CO4	5	4	4	3	4	4	5	5	4	3	5	5	5	4.3	
CO5	4	5	5	5	4	5	4	5	4	4	4	5	5	4.5	
Mean Overall Score														4.4	

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

III BBM	**RESEARCH METHODOLOGY**	**CODE -21EBM506**
SEM V		**HRS/WEEK – 5**
Discipline Specific Elective-II(A)		**CREDIT - 4**

OBJECTIVE:
The course aims at introducing themthe basic concepts used in research and to scientific social research methods and their approach.

Unit – I Introduction to Research and Methods (15Hrs)
Research –Meaning and Definition- Types of Research – Research Methods – Problems faced by Researcher – Research Process _ Various Steps in Research Process. Review of literature – Identification Research Gap – social relevance of research - Research Problem – Sources, Identification and Developing Research Problem – Construction of Research Questions – Framing Objectives and hypotheses.

Unit –II Research Design (18 Hrs)
Concepts– Meaning, Definition and types - Variables – Meaning & Definition – Types of Variables**.** Research Design - Meaning, Definition - types of Research Design – Experimental and non-Experimental Research Design – Characteristic of good Research Design – Relationship between Research Problem and Research Design.

Unit –III Sampling Design and Data Collection (17Hrs)
Sample – meaning and definition- sample size- sampling design – meaning and definition- essentials of good sampling design- methods of sampling- random and non- random sampling- sampling and non- sampling error- reduction of sampling errors. Data- types of data- primary data- different methods of collecting primary data- measurement of scale and scaling techniques-construction of questionnaire- secondary data- various sources of secondary data

Unit –IV Data analysis (15Hrs)
Steps in processing the data – editing- coding- classification- content analysis- tabulation- methods of tabulation. Application of statistics in data analysis- descriptive statistics- mean, median, mode, standard deviation- correlation and regression- inferential statistics using Excel- chi-square test- ANNOVA, T- test-,F-Test- tools for testing hypothesis. Application of computer in modern research.

Unit –V Report writing (10Hrs)
Research report- meaning-, types of research report- essential of good research report- stages in preparing research report- structure of research report- preliminary pages, main body of the report and reference material- guidelines and mechanics for preparing research report.

TEXT BOOKS :

1. C.R. Kothari- Research Methodology- New age international pvt Ltd- 2004
2. Ranjit Kumar – Research Methodology: A step by step guide for Beginners- Sage publications Ltd- - 3rd edtion-2011

REFERENCE BOOKS:

1. R.Pannerselvam – Research Methodology- PHI Learning Private Ltd - 2014
2. Pagadala Sugandha Devi – Research Methodology : A Hand book for Beginners- Notion press- 2017
3. Dr.J.A.Khan – Research Methodology – APH publishing Corporation- 2011

III B.Com. BANK MANAGEMENT

YEAR - III	RESEARCH METHODOLOGY	CODE – 17BB502
SEMESTER –V		HOURS/WEEK – 6
CORE THEORY – 10		CREDIT - 5

Objective: To understand and familiarize the concepts of Research Methodology.

Course Outcomes(CO's):On successful completion of the course students will be able

CO1: To impart the students with knowledge in the field of research and to enhance them to utilize various methods of research.

CO2: To enrich the students to identify appropriate research topics, select and define appropriate research problem and parameters, develop a better research design and to synchronize with the research problem to fill the research gap.

CO3: To familiarize with preparing a project proposal (to undertake a project), sampling design, different types of data, data collection methods and various sources of primary and secondary data.

CO4: To enable the students to perform data processing, editing, coding of data, tabulation, data analysis using various tools.

CO5: To enhance the skills of writing a research report and thesis report writing, referencing and to explore to various reporting standards.

Semester	Course Code	Course Title	Hours	Credit
V	17BB502	Research Methodology	6	5

Course Outcomes (COS)	Programme Outcomes (PO's)					Programme Specific Outcomes (PSO's)								Mean Score Of COS
	PO 1	PO 2	PO 3	PO 4	PO 5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	
CO1	5	3	3	3	4	4	5	4	5	4	5	3	3	3.92
CO2	5	4	5	4	5	3	5	3	3	3	4	3	2	3.77
CO3	4	5	4	3	5	4	3	4	5	3	4	3	3	3.85
CO4	3	4	3	5	3	4	3	4	4	5	4	3	2	3.62
CO5	4	4	4	5	3	5	3	5	4	3	5	3	4	4.00
									Mean Overall Scores					3.83

Result: The Score of this Course is 3.83 (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 Introduction to Research and Methods (18 Hrs)

Research –Meaning and Definition- Types of Research – Research Methods – Problems faced by Researcher – Research Process _ Various Steps in Research Process. Review of literature – Identification Research Gap – social relevance of research - Research Problem – Sources, Identification and Developing Research Problem – Construction of Research Questions – Framing Objectives and hypotheses.

Unit –II Research Design (20Hrs)

Concepts – Meaning, Definition and types - Variables – Meaning & Definition – Types of Variables**.** Research Design - Meaning, Definition - types of Research Design – Experimental and non-Experimental Research Design – Characteristic of good Research Design – Relationship between Research Problem and Research Design.

Unit –III Sampling Design and Data Collection (20 Hrs)

Sample – meaning and definition- sample size- sampling design – meaning and definition- essentials of good sampling design- methods of sampling- random and non- random sampling- sampling and non- sampling error- reduction of sampling errors. Data- types of data- primary data- different methods of collecting primary data- measurement of scale and scaling techniques-construction of questionnaire- secondary data- various sources of secondary data

Unit –IV Data analysis (18 Hrs)

Steps in processing the data – editing- coding- classification- content analysis- tabulation- methods of tabulation. Application of statistics in data analysis- descriptive statistics- mean, median, mode, standard deviation- correlation and regression- inferential statistics using Excel- chi-square test- ANNOVA, T- test- F-Test- tools for testing hypothesis. Application of computer in modern research.

Unit –V Report writing (14 Hrs)

Research report- meaning-, types of research report- essential of good research report- stages in preparing research report- structure of research report- preliminary pages, main body of the report and reference material- guidelines and mechanics for preparing research report. Reporting standards.

Text books:

1. Donald R Cooper, Pamela S Schindler, Business Research Methods, 9th Edition, McGraw Hill Publications, 2006
2. Kothari.C.R. – ―Research Methodology – methods and technology, New age international publisher, New Delhi.

Reference books:

1. Paneerselvam.R. - ―Research Methodology‖ Prentice Hall of India, New Delhi,2004.
2. Krishnaswami .O.R. – ―Methodology of Research in Social sciences‖ Himalaya Publishing House, Mumbai.
3. Dr.D. Amarchand, (2000) Research Methods in Commerce, Emerald Publications, Chennai.

M.A. HISTORY

Year - II	**HISTORIOGRAPHY AND RESEARCH METHODOLOGY**	**Code : PHI1017**
Semester - IV		**Hours / Week : 6**
		Credit: 5

Objectives:

1. To expose students to the writings of history from ancient to the modern times.
2. To enable the students of history become aware of some renowned historians and their contributions to historical developments.
3. To expose the students to different techniques in research methodology.
4. To equip the students to with the skills for writing research papers/dissertation.

Course Outcome (CO)

CO1: Students will be able to connect science and technology to real world problems by explaining how science relates to problems of societal concern

CO2: Distinguish between sound and unsound interpretations of scientific information

CO3: Demonstrate knowledge of scientific and technological advancements and their impact on historical and modern societies

CO4: Student will be understand the difference between ancient scientific knowledge of Indians in to Modern scientific Technology

SEMESTER IV	**COURSE CODE: PHI1017**					**COURSE TITLE: HISTORIOGRAPHY AND RESEARCH METHODOLOGY**					**HOURS:6**
COURSE OUTCOME (COs)	**PROGRAMME OUTCOMES (POs)**					**PROGRAMME SPECIFIC OUTCOMES (PSOs)**					**CREDIT:5**
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	**MEAN SCORE OF CO'S**
CO1	3	3	2	3	3	2	2	3	2	3	**2.60**
CO2	2	3	3	2	2	3	3	3	3	3	**2.70**
CO3	3	3	3	3	1	3	2	3	3	2	**2.60**
CO4	3	3	3	2	2	3	2	3	3	3	**2.70**
	MEAN OVERALL SCORE										**2.65**

Result: The score of this course is 2.65 (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

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

HISTORIOGRAPHY

1. What is history – Philosophy of history, History: Nature, Scope, causation and change – purpose of history – concept of progress – Whether history repeats itself.
2. History of History – Greco – Roman historiography – Christian historiography – St. Augustine – Medieval Arab Historiography: Ibn Khaldun Modern European historiography – Machiavelli to Vico – Voltaire – positivists Ranke, Spengler, Toynbee, Annale School – Materialists.

Indian Historiography – Whether India had historical sense Ancient historiography, Medieval historiography – Indian historiography today – Important historians – R.C. Majumdar, K.P. Jayaswal, R.C. Dutt, J.N. Saqkar, D.D. Kosambi, K.A.N. Sastri, S.K. Aiyangar, K.K. Pillai, K.Rajayyam, Sheik Ali.

Research Methodology – Meaning of Research – Research in History – Various Historical research methods – objectivity and subjectivity – causation in History – Inter – disciplinary approach to history.

Thesis Writing: Selection of a Research topic – collection of Data – Sources-primary and Secondary – Internal and External criticism – Analytical and synthetic operations – Descriptive and interpretative methods – documentation procedure – Footnotes – Bibliography – Tables and charts – writing.

BOOKS FOR STUDY:

1. E.H. Carr, What is History ?, (Harmondsworth 1977)
2. R.G. Collingwood, The Idea of History (Oxford 1977), Parts III,IV,V.
3. Ali, Sheik, History: Its Theory and Methods, New Delhi: Macmillan,1980

REFERENCE BOOKS:

1. S. Clark, 'The Annales Historians', in Q. Skinner, (ed), The Return of Grand Theory in the Human Scienes, (Cambridge 1985).
2. Manickam S. (1977) Theory of History & Method of Research, Paduman Pub, (New Delhi, 1988)
3. Guha, Ranajit (1994) Subaltern Studies Vol. I, IV and VI, Delhi: OUP.
4. Marwick, Aurther, (1984), The Nature of History, Hong Kong: Macmillan (Reprint).
5. Stern, Fritz, (1973) Varities of History, New York: Vintage Books.
6. Bridget Somekh and Cathy Lewin, Research Methods in the Social Sciences, (New

Delhi: Vistaar Publications, 2005).
7. Floud, Roderick (1983) An Introduction to Quantitative Methods for Historians, London: Methuen (R.P).
8. Malcolm Williams, Science and Social Science: An Introduction, London and New York: Routledge, 2000.

M.S.W. SOCIAL WORK

I – M.S.W	**SOCIAL WORK RESEARCH AND STATISTICS**	**PSW21A**
SEMESTER – II		**HRS/WK : 4**
CORE– V		**CREDIT : 4**

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

SEMESTER II	**COURSE CODE: PSW21A**					**TITLE OF THE COURSE: SOCIAL WORK RESEARCH AND STATISTICS**				**HOURS:4**	**CREDITS:4**
COURSE OUTCOMES (CO)	**PROGRAMME OUTCOMES (PO)**					**PROGRAMME SPECIFIC OUTCOMES (PSO)**				**MEAN SCORE OF CO'S**	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	
CO1	**4**	**5**	**4**	**5**	**4**	**4**	**4**	**5**	**4**	**4**	**4.3**
CO2	**3**	**5**	**4**	**4**	**4**	**4**	**4**	**5**	**3**	**3**	**3.9**
CO3	**2**	**4**	**3**	**4**	**2**	**3**	**3**	**4**	**3**	**3**	**3.1**
CO4	**2**	**4**	**3**	**3**	**2**	**3**	**3**	**4**	**3**	**3**	**3**
CO5	**4**	**5**	**4**	**4**	**4**	**4**	**3**	**4**	**3**	**3**	**3.8**
	Mean Overall Score										**3.62**

Result: The Score of this Course is 3.62 (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 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; 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, M.argham 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, 3rd Edition, Australian Publications, Australia.
3. Babbie E, 2013, The Practice of Social Research, 13th 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 a Research Project, Viva Books, New Delhi.
6. Gupta B L, 2010, Research studies in Staff Development, Mahamaya Publishing house, New Delhi.
7. Pawar B S, 2009, Theory building for Hypothesis Specification in Organizational Studies, R1esponse 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, New Delhi.