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1.1.2: The programmes offered by the institution focus on employability / entrepreneurship / skill development and their course syllabi are adequately revised to incorporate contemporary requirements

SYLLABUS OF THE COURSES FOCUSING EMPLOYABILITY / ENTREPRENEURSHIP / SKILL DEVELOPMENT

Colour Coding

EMPLOYABILITY

ENTREPRENEURSHIP

SKILL DEVELOPMENT

M.Sc. COMPUTER SCIENCE

I M.Sc (CS)	OBJECT ORIENTED ANALYSIS AND DESIGN WITH UML	PCS702S
SEMESTER – I		HRS/WK – 4
CORE – 2		CREDIT – 3

Objective:
To enable the students to learn the Software development methods and tools related with Object Oriented Technology.

Course Outcomes (CO):
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: Design databases to support the software applications and document them using UML class diagrams
CO4: Develop UML sequence diagrams from robustness diagrams
CO5: Ability to learn software quality Assurance and Debugging principles.

Relationship Matrix Course Outcome, Programme Outcome and Programme Specific Outcome

SEMESTER I	COURSE CODE: PCS702S					COURSE TITLE: OBJECT ORIENTED ANALYSIS AND DESIGN WITH UML					HOURS: 4	CREDITS: 3
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 **[12Hrs]**

Overview Of OOSD: Introduction – Methodology.

Object Basics: Objects- Attributes- Encapsulation and Information Hiding – Class Hierarchy – Polymorphism-Object Relationships and Associations-OOSDLC – The Software Development Process.

UNIT – II **[13Hrs]**

Object Oriented Methodologies: Introduction – Rumbaugh et al.'s Object Modeling Technique – The Booch Technology – Jacobson et al. Methodologies – Patterns – Frameworks – The Unified Approach.

UNIT – III **[11Hrs]**

Unified Modeling Language: Introduction – UML Diagrams – UML Class Diagram – Use Case Diagram – UML Dynamic Modeling – UML Extensibility – UML Meta model.

UNIT – IV **[12Hrs]**

Object Oriented Analysis: Introduction – Use Case Model – Developing Effective Documentation. **OBJECT ORIENTED DESIGN**: Introduction – Axioms – Corollaries – Design Patterns.

UNIT – V **[12Hrs]**

Software Quality Assurance: Introduction-Quality Assurance tests – Testing Strategies – Impact of Object Orientation on Testing – Test Cases – Test Plan – Continuous Testing – Myer's Debugging Principles

Text Book:

1."Object Oriented Systems Development", Ali Bahrami - Irwin-McGraw Hill, New Delhi, McGraw Hill Education (1st edition), 2017

Reference Books:

1. "Object –Oriented analysis and Design with Applications", Grady Booch - Pearson Education – Ninth Indian Reprint 2002, First Impression 2006.

2. " The Unified Modeling Languages User Guide", Grady Booch, James Rumbaugh and Ivar Jacobson - Addison Wesley – Fourth Indian Reprinting 2000, Fifth Impression 2007.

I M.Sc(CS)	ADVANCED JAVA PROGRAMMING	PCS703S
SEMESTER – I		HRS/WK – 4
CORE – 3		CREDIT – 4

Objectives:

- This course provides an in-depth knowledge of Advanced Java language and programming.
- Implementing Java components
- Practicing RMI, JDBC
- Ability to understand Multithreading

Course Outcomes (CO):

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: PCS703S					COURSE TITLE: ADVANCED JAVA PROGRAMMING					HOURS: 4	CREDITS: 4
COURSE OUTCOME	PROGRAMME OUTCOME(PO)					PROGRAMME SPECIFIC OUTCOME(PSO)					MEAN SCORE OF CO	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	3.5	
CO1	2	3	3	4	4	4	4	4	3	4		
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 Outcome

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]**

Ava 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)	UNIX NETWORK PROGRAMMING	PCS704S
SEMESTER – I		HRS/WK – 4
CORE – 4		CREDIT – 4

Objective:
To make the student aware of all concepts related to Net Working and make them well versed in Unix networking programming.

Course Outcomes (CO):
CO1: Ability to gain knowledge about basics of UNIX, files and file types.
CO2: Ability to understand UNIX process and process identifiers
CO3: Ability to know about SVR4 and different file locking methods.
CO4: Ability to know about function of TCP and UDP sockets.
CO5: Ability to the uses of TCP and UDP echo client server.

Relationship Matrix Course Outcome, Programme Outcome and Programme Specific Outcome

SEMESTER I	COURSE CODE: PCS704S					COURSE TITLE: UNIX NETWORK PROGRAMMING					HOURS : 4	CREDITS : 4
COURSE OUTCOME	PROGRAMME OUTCOME(PO)					PROGRAMME SPECIFIC OUTCOME(PSO)					MEAN SCORE OF CO	
	PO 1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	4	3	4	3	4	4	3	4	3	3	3.5	
CO2	4	4	3	3	4	4	3	4	4	4	3.7	
CO3	3	3	3	3	3	3	4	4	3	4	3.3	
CO4	4	3	4	4	3	3	4	4	4	3	3.6	
CO5	3	3	3	3	3	4	3	4	4	4	3.4	
Overall Score										Mean	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 **[12 Hrs]**

Introduction & File System: Overview of UNIX OS - File I/O - File Descriptors - File sharing - Files and directories – File types - File access permissions - File systems - Symbolic links - Standard I/O library - Streams and file objects - Buffering - System data files and information - Password file - Group file - Login accounting - system identification.

UNIT-II **[12 Hrs]**

Processes: Environment of a UNIX process - Process termination - command line arguments - Process control - Process identifiers - Process relationships terminal logins - Signals -threads.

UNIT-III **[12 Hrs]**

Inter-process Communication: Introduction - Message passing (SVR4)- pipes - FIFO - message queues – Synchronization (SVR4) - Mutexes - condition variables - read - write locks – file locking - record locking -semaphores - Shared memory (SVR4).

UNIT-IV **[10 Hrs]**

Sockets: Introduction - transport layer - socket introduction - TCP sockets - UDP sockets – raw sockets - Socket options - I/O multiplexing - Name and address conversions.

UNIT-V **[14 Hrs]**

Applications: Debugging techniques - TCP echo client server - UDP echo client server - Ping - Trace route - Client server applications like file transfer and chat

Text Books:

1. "Advanced programming in the UNIX environment", W. Richard Stevens- Addison Wesley, 1999 (Unit 1,2 & 3)
2. "Unix Network Programming Volume-1: The Sockets Networking API", W. Stevens, Bill Fenner, Andrew Rudoff, 3rd Edition- Pearson education, 2003(unit 4 & 5)

Reference Books:

1. "The 'C' Odyssey Unix The open Boundless C" ,Meeta Gandhi, Tilak Shetty and Rajiv Shah - BPB Publications (1st Edition) 1992.
2. "UNIX network programming: Intercrosses Communications", Stvens, Vo l2, (2nd edition) - PHI.1999.

I M.Sc (CS)	COMPUTER SYSTEM ARCHITECTURE For the students admitted from the year 2014	EPCS705Q
SEMESTER – I		HRS/WK – 4
Elective – 1A		CREDIT – 3

Objective:
To learn the advanced concepts of Computer Architecture.

Course Outcomes (CO):

CO1: Examine the performance of different parallel model.
CO2: Develop the pipeline concept for a set of instructions.
CO3: Discriminate the performance of pipeline and non-pipeline.
CO4: Understand the concept of parallel and scalable architecture.
CO5: Compare the properties of shared memory and distribute multiprocessor System and cache coherency.

Relationship Matrix Course Outcome, Programme Outcome and Programme Specific Outcome

SEMESTER I	COURSE CODE: EPCS705Q					COURSE TITLE: COMPUTER SYSTEM ARCHITECTURE					HOURS : 4	CREDITS : 3
COURSE OUTCOME	PROGRAMME OUTCOME(PO)					PROGRAMME SPECIFIC OUTCOME(PSO)					MEAN SCORE OF CO	
	PO 1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	3	3	4	3	2	4	4	3	4	4	3.4	
CO2	4	4	4	3	2	4	4	3	4	4	3.7	
CO3	3	3	3	4	2	4	4	3	3	3	3.2	
CO4	3	3	3	3	2	4	4	3	3	3	3.1	
CO5	3	3	3	4	2	4	3	3	3	3	3.1	
Overall Score										Mean	3.2	

Result: The 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	Poor	Moderate	Good	Very Good	Excellent

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

UNIT-I **[10 Hrs]**

Parallel Models: Multiprocessors and Multicomputer – Multi vector and SIMD Computers – PRAM and VLSI Models – Conditions of Parallelism: Data and Resource Dependences.

UNIT-II **[13 Hrs]**

Processors And Memory Hierarchy: Advanced Processor Technology: Instruction-Set Architecture, CISC, RISC Scalar Processor – Memory Hierarchy Technology: Hierarchical Memory Technology, Inclusion, Coherence and Locality – Virtual Memory Technology – Cache Memory Organization.

UNIT-III **[13 Hrs]**

Pipelining And Superscalar Techniques: Linear Pipeline Processors – Non- Linear Pipeline Processors – Instruction Pipeline Design – Arithmetic Pipeline Design.

UNIT-IV: **[12 Hrs]**

Parallel And Scalable Architecture: Multiprocessor System Interconnects – Vector Processing Principles – SIMD Computer Organizations: Implementation Models.

UNIT-V **[12 Hrs]**

Scalable, Multithreaded: Latency Hiding Techniques: Shared Virtual Memory, Prefetching Techniques, Distributed Coherent Caches – Principles of Multithreading: Multithreading Issues and solutions, Multiple Context Processors.

Text Books:

1. "Advanced Computer Architecture- Parallelism, Scalability, Programmability", Kai Hwang, - McGraw Hill- 1993.
2. "Advanced Computer Architecture- Parallelism, Scalability, Programmability", Kai Hwang, McGraw Hill- Second Edition-2000.

Reference Books:

1. "Computer System Architecture", M.M.Mano-PHI(3rd Edition), 1994.
2. "Computer Architecture and Parallel Processing", Hwang Briggs- McGraw Hill-1985.
3. "Computer Organization and Architecture - Designing for Performance", William Stallings - PHI, 2000.

I M.Sc(CS)	ARTIFICIAL NEURAL NETWORKS	EPCS705A
SEMESTER – I		HRS/WK – 4
ELECTIVE – 1B		CREDIT – 3

Objectives:

- To enable the student to understand the concepts and principles of fuzzy and Neural Networks.
- Investigate some common models and their applications.

Course Outcomes (CO):

CO1: Understand the basics of Artificial Neural Network
CO2: Able to know about Architecture and Training of ANN
CO3: Understand the concept of Memory and learning process of ANN
CO4: Understand the concept of unsupervised learning
CO5: Learn and improve the skill about Simulation of Neural Network

Relationship Matrix Course Outcome, Programme Outcome and Programme Specific Outcome

SEMESTER I	COURSE CODE: EPCS705A					COURSE TITLE: ARTIFICIAL NEURAL NETWORKS					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	4	3.5	4	4	4	5	4.5	4.3	4.2	4.5	4.2	
CO2	4	4	3	3	4	4.3	4.3	4	3	4	3.7	
CO3	4	4	4	4	3	4	4	4	3	4	3.8	
CO4	4	4	3	4	4	4	4	4	3	4	3.8	
CO5	4	4	4	4	4	4	4	4	4	4	4.0	
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 **[10 Hrs]**

INTRODUCTION: Definition – fundamental concepts – applications – advantages and disadvantages – classifications – biological neural network – artificial neural structure – activation functions – adding bias – perception – MLP.

UNIT II **[10 Hrs]**

FEED FORWARD ANNs: Structure – delta rule – architecture and training – radial basis function – time delay NN.

UNIT III **[13 Hrs]**

ATTRACTOR ANNs: Associative learning – attractor NN – linear associative memory – Hopfield network – content addressable memory – simulated annealing – Boltzmann machine – bidirectional associative memory.

UNIT IV **[13 Hrs]**

UNSUPERVISED ANNs: Clustering procedures – C-Means algorithm – learning vector quantization – MAXNET – self-organizing feature maps – adaptive resonance architectures.

UNIT V **[14 Hrs]**

ANN SIMULATION IN MATLAB: Creating a custom neural network – initializations – setting weights and bias – using different transfer functions – using training parameters – simulating and plotting network – designing a complete FF neural network (supervised) – designing self organizing maps (unsupervised).

Text Books:

1. "Artificial Neural Networks", Robert J. Schalkoff-New Delhi, McGraw Hill, 1997.
2. "Neural Networks: A Classroom Approach", Satish Kumar- McGrawHill,New Delhi , 2004.
3. "Neural Networks, Fuzzy Logic and Genetic Algorithms Synthesis and Applications", S. Rajasekaran, G. A. VijayalakshmiPai - Prentice Hall , India, 2003.
4. "Fundamentals of Neural Networks" , LaureneFausett - Prentice Hall, 1994.
5. "Neural Network in Computer Intelligence ",Limin Fu- McGraw Hill International, 1994..

Reference Books:

1. "Neural Networks, S.Haykin", A Comprehensive Foundation. Prentice Hall,1999
2. "Neural Networks: Algorithm, Applications and Programming Techniques", Freeman, A. James and Skapura, M. David. California, Addison-Wesley Longman, 2002.
3. "Principles of Neuro Computing for Science of Engineering. Fredric", M. Ham, Ivica Kostunica- Tata McGraw Hill, 2002

I M.Sc (C.S)	MODERN OPERATING SYSTEM	EPCS705C
SEMESTER –I		HRS/WK-4
ELECTIVE-1C		CREDIT-3

Objective:
To provide a clear description of the fundamental concepts in an operating system and design principles that is applicable to a variety of distributed operating system.

Course Outcomes (CO):
CO1: Ability to gain knowledge about basics of Computer System Structures.
CO2: Ability to understand Process Management &CPU Scheduling
CO3: Ability to know about Distributed Computing System.
CO4: Ability to know about function of Synchronization
CO5: Ability to learn the uses of security

Relationship Matrix Course Outcome, Programme Outcome and Programme Specific Outcome

SEMESTER I	COURSE CODE: EPCS705C					COURSE TITLE: MODERN OPERATING SYSTEM					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	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	
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 **[12Hrs]**

INTRODUCTION: Computer-System Operation– Storage Hierarchy– General System Architecture. **OPERATING SYSTEM STRUCTURES:** System Components – System Calls – Virtual Machines– System Generation.

UNIT- II **[12 Hrs]**

PROCESS MANAGEMENT: Processes–Process Concept – Operation on Processes– Inter - Process Communication.

CPU SCHEDULING: Basic Concepts–Scheduling Algorithms–Real Time Scheduling-Process Synchronization–Background–Critical- Selection Problem–Semaphores -Deadlocks–System Model– Methods for Handling Deadlocks–Deadlock Avoidance–Recovery from Deadlock.

UNIT- III **[12 Hrs]**

DISTRIBUTED COMPUTING SYSTEM: Evolution- Models- Distributed Operating System - Issues in Designing DOS - Distributed Computing Environment. **COMMUNICATION IN DISTRIBUTED SYSTEM:** Protocols-Features of Good Message Passing System- Issues in IPC by Message Passing-Synchronization-Buffering- Process Addressing-Failure Handling- Group Communication.

UNIT- IV **[12 Hrs]**

SYNCHRONIZATION: Clock Synchronization– Event Ordering- Mutual Exclusion - Deadlock - Election Algorithms.

PROCESS MANAGEMENT: Process Migration-Threads.

UNIT- V **[12 Hrs]**

SECURITY: Potential Attacks to Computer Systems – Cryptography–Authentication- Access Control-Digital Signatures-Design Principles.

INTERPROCESS COMMUNICATION: Process Tracing-System VIPC -Sockets. **MULTIPROCESSOR SYSTEMS:** Problem of Multiprocessor Systems-Solution with Master and Slave Processors-Solution with Semaphores.

Text Books:

1. "Operating System Concepts Abraham Silberschatz and Peter Baer Galvin", Addison Wesley (4th Edision)- New York, 1999, Unit I & II
2. "Distributed Operating Systems Concepts and Design", Pradeep K. Sinha -Prentice Hall, New Delhi, 2004.Unit III, IV & V.

Reference Book:

1. "Modern Operating Systems", Andrew S Tanaenbaum-PHI, New Delhi, 1997.

I M.Sc(CS)	ADVANCED JAVA PROGRAMMING	PCSP101T
SEMESTER – I		HRS/WK – 5
CORE PRACTICAL – I		CREDIT – 3

Objectives:

- This provides an in-depth knowledge of Advanced Java language and programming
- Gain an in-depth understanding of database programming in Java using JDBC.
- Learn how to do distributed programming in Java using RMI and CORBA.

Course Outcomes (CO):

After learning this course, the students should be able to expose

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
2. https://www.codewithc.com/category/projects/java-projects

I M.Sc(CS)	ADVANCED UNIX PROGRAMMING	PCSP102T
SEMESTER – I		HRS/WK – 5
CORE PRACTICAL – 2		CREDIT –3

Objective:
To make the student aware of all concepts related to Unix networking programming.

Course Outcomes (CO):
After learning this course, the students should be able to expose
CO1: Ability to gain knowledge about basics of shell script.
CO2: Ability to understand UNIX process and process identifiers
CO3: Ability to know about the grep statements in Shell Scripts.
CO4: Ability to know about functions of shell scripts.
CO5: Ability to write Shell Scripts for search all sub-directories and its current directory

Relationship Matrix Course Outcome, Programme Outcome and Programme Specific Outcome

SEMESTER I	COURSE CODE: PCSP102T					COURSE TITLE: ADVANCED UNIX 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	4	4	4	4	4	4	4	3	3	3.8	
CO2	3	4	3	4	4	4	4	4	3	4	3.7	
CO3	3	4	3	4	3	4	4	4	3	4	3.6	
CO4	4	3	3	4	3	4	4	4	3	4	3.6	
CO5	4	4	4	4	4	4	4	4	4	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

ADVANCED UNIX PROGRAMMING

1. Write a shell script to copy, rename and print multiple files using choice menus.
2. Write a shell script to display logged in users who are using high CPU percentage.
3. Write a shell script to list processes based on CPU percentage and memory un usage.
4. Write a shell script to display total used and free memory space.
5. Write a shell script that takes as command-line input a number n and a word. The program should then print the word n times, one word per line.
6. Write a shell script using the following statements.
    a. While-loop
    b. For-loop
    c. If-then-else
    d. Switch
7. Write a shell script using grep statement.
8. Write a shell script that can search all immediate sub-directories of the current directory for a given file and then quit if it finds one.

WEB REFERENCE:

1. https://www.tutorialspoint.com/unix/index.htm

I M.Sc(CS)	SOFTWARE TESTING	PCS806S
SEMESTER – II		HRS/WK – 4
CORE -5		CREDIT – 3

Objective:
To enable the students to learn the fundamentals of Software Planning and Testing.

Course Outcomes (CO):
After learning this course, the students should be able to expose
CO1: Ability to know the Purpose of Software Testing
CO2: Ability to understand the Principles of Testing
CO3: Ability to acquire knowledge about the types of testing
CO4: Ability to apply basic test of object-oriented systems
CO5: Ability to learn the Organizations Structures for Testing Teams

Relationship Matrix Course Outcome, Programme Outcome and Programme Specific Outcome

SEMESTER II	COURSE CODE: PCS806S					COURSE TITLE: SOFTWARE TESTING					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	3	2	4	3	3	2	3	4	3.0	
CO2	3	4	3	4	4	3	3	2	3	4	3.3	
CO3	3	3	4	3	3	3	3	2	4	3	3.1	
CO4	4	3	4	3	3	3	3	3	2	3	3.1	
CO5	3	3	4	3	3	3	3	3	3	4	3.2	
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<=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: Purpose of Software Testing- Is Complete Testing Possible? - The Consequence of Bugs -Taxonomy of Bugs.

UNIT-II **[12 Hrs]**

PRINCIPLES OF TESTING: Software Development Life Cycle Models-Phases of Software Project - Quality – Assurance – Control –Testing - Verification- Life Cycle Model - Waterfall Model - Rapid Application Development Models - Spiral Model-V Model.

UNIT- III **[13 Hrs]**

TYPES OF TESTING: White Box Testing-Static Testing-Structural Testing-Black Box Testing-Integration Testing- Phase of Testing- Scenario Testing-Defect Bash-System and Acceptance Testing –Functional System Testing-Non-Functional Testing-Regression Testing-Internalization Testing-Ad hoc testing.

UNIT-IV **[12 Hrs]**

TEST OF OBJECT-ORIENTED SYSTEMS: Usability and Accessibility Testing-Approach - Quality Factors-Tools for Usability-Test roles for usability-Common People Issues-Comparison between Testing and Development Functions-Role of Echo system.

UNIT-V **[11 Hrs]**

ORGANIZATIONS STRUCTURES FOR TESTING TEAMS: Dimension-Structure-Single Product Company - Multi product companies - Effects of Globalization - Testing service Organization-Test Management and Automation -Test planning -Test Process-Test Reporting - Best Practices.

Text Books:

1. "Software Testing Principles and Practice's, Srinivasan Desikan, Gopalswamy Ramesh - Pearson Education Publication, 2006
2. "The Craft of Software testing including Object Based and Object-Oriented Testing", Brain Marik- Prentice-Hall,1995.

Reference Book:

1. "Lessons Learned in software testing", CemKaner, James Bach-Wiley (1st edition) 2008

II-MSC (CS)	PYTHON PROGRAMMING For the students admitted from the year 2021	21PCS807
SEMESTER – II		HRS/WK – 4
CORE –6		CREDIT – 4

Objective:

The course introduces students to learn fundamentals of Python Programming and have an understanding of Python and its various Programming constructs.

Course Outcomes (CO):

CO1: To Learn the introduction and Features of Python
CO2. Learn the Basic Syntax of Python
CO3. Learn about the Strings, Lists, Tuples and Dictionary in Python
CO4. Acquired an idea about Control Structures in Python
CO5. Understood the Defining a Function – Calling a Function

Relationship Matrix Course Outcome, Programme Outcome and Programme Specific outcome

SEMESTER II	COURSE CODE: 21PCS807					COURSE TITLE: PYTHON PROGRAMMING					HOURS: 4	CREDITS: 4
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	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-I **[Hrs 12]**

Introduction To Python: Features of Python – Applications of Python – Installing and Running Python

UNIT- II **[Hrs 11]**

Basic Syntax Of Python: Python Identifiers – Comments in Python –Variables – Standard Data types in Python

UNIT- III **[Hrs 13]**

Strings, Lists, Tuples And Dictionary In Python: -Simple Programs in Python - Operators and its types in Python – Operator Precedence

UNIT- IV **[Hrs 12]**

Control Structures In Python: Decision Making Statements – Looping Constructs – Unconditional Control Statements.

UNIT –V **[Hrs 12]**

Function In Python: Defining a Function – Calling a Function – Call by Value and Reference – Function Arguments – Anonymous Functions – Return Statement – Scope of Variables.

Text Books:

1. "Introduction to Computing and Problem Solving with PYTHON", Jeeva Jose and P. Sojan Lal, Khanna Book Publishing Co. (P) Ltd., 2016.
2. "Core Python Programming", Wesley J. Chun, Second Edition, Prentice Hall Publication, 2006.

Reference Book:

1. "Python Programming for Absolute Beginners", Micheal Dawson, Third Edition, Course Technology, 2010.

II-MSC (CS)	WIRELESS COMMUNICATION TECHNOLOGIES	19PCS808
SEMESTER – II		HRS/WK – 4
CORE-7		CREDIT – 3

Objectives:

1. To know about the various frequency Spectrum and Signals for wireless communication
2. To Know the concept of Infrared, Cordless and WLL
3. To understand the concepts wireless communication technologies such as Wireless LAN, WiMAX, Bluetooth and Wi-Fi

Course Outcomes (CO):

After learning this course, the students should be able to expose

CO1: Ability to know the Purpose of Protocols and the TCP/IP Suite
CO2: Ability to understand the Principles of Signal Encoding Techniques
CO3: Ability to acquire knowledge about the wireless networking
CO4: Ability to understand the cordless systems and wireless local loop
CO5: Ability to learn the IEEE 802.11 Wireless LAN Standard

Relationship Matrix Course Outcome, Programme Outcome and Programme Specific Outcome

SEMESTER II	COURSE CODE: 19PCS808					COURSE TITLE: WIRELESS COMMUNICATION TECHNOLOGIES					HOURS: 4	CREDITS: 3
COURSE OUTCOME	PROGRAMME OUTCOME(PO)					PROGRAMME SPECIFIC OUTCOME(PSO)					MEAN SCORE OF CO	
	PO 1	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 **[12 Hrs]**

Introduction To Protocols And The Tcp/Ip Suite-: The Need for a Protocol Architecture, The TCP/IP Protocol Architecture, The OSI Model, Inter-networking. Wireless Communication Technology- Antennas and Propagation- Antennas, Propagation Modes, Line - of-Sight Transmission, Fading in the Mobile Environment.

UNIT -II **[13Hrs]**

Signal Encoding Techniques: Signal Encoding Criteria, Digital Data- Analog Signals, Analog Data-Analog Signals, Analog Data-Digital Signals, The Concept of Spread Spectrum- Frequency Hopping Spread Spectrum, Direct Sequence Spread Spectrum, Code Division Multiple Access, Generation of Spreading Sequences.

UNIT -III **[13Hrs]**

Wireless Networking: Satellite Communications- Satellite Parameters and Configurations, Capacity Allocation-Frequency Division, Capacity Allocation-Time Division Cellular Wireless Networks- Principles of Cellular Networks, First-Generation Analog, Second-Generation - TDMA, CDMA, Third-Generation Systems.

UNIT -IV **[12 Hrs]**

Cordless Systems And Wireless Local Loop: Cordless Systems, Wireless Local Loop - Wireless LANs- Wireless LAN Technology – Overview, Infrared LANs, Spread Spectrum LANs, Narrowband Microwave LANs.

UNIT -V **[10 Hrs]**

IEEE 802.11 Wireless LAN Standard: IEEE 802 Protocol Architecture, IEEE 802.11 Architecture and Services, IEEE 802.11 Medium Access Control. Introduction to Wi-Fi and Bluetooth Technologies (Only Overview).

Text Book:

1. "Wireless Communications and Networks,William Stallings", Pearson Prentice Hall (2nd edition), 2005. (Chapters 4, 5, 6, 7, 9, 10,11, 13, 14, 15.1)

Reference Books:

1. "Wireless Communication Technology", Steve Rackley-Elsevier, 2007
2. "Adhoc Wireless Networks- Architechture and Protocols", C. Siva Ram Murthy and B.S.Manoj-Pearson Prentice Hall, 2004

I M.Sc(CS)	WEB TECHNOLOGY	19PCS809
SEMESTER – II		HRS/WK – 4
CORE – 8		CREDIT – 3

Objectives:

- To enable the students to learn the principles of Internet programming.
- To Gain knowledge in Internet basics and XML
- To Understand Java Script and PHP programming.

Course Outcomes (CO):

CO1: Understand the basics of internet communications and hardware elements associated with it.
CO2: Learn the fundaments of HTML tags, frames, frameset and tables.
CO3: Acquire knowledge about java script and its controls statements, functions, objects.
CO4: Understand about XML, CSS, XSL, DTD, XSD.
CO5: Create dynamic web applications with PHP scripting.

Relationship Matrix Course Outcome, Programme Outcomes and Programme Specific Outcome

SEMESTER II	COURSE CODE:19PCS809					COURSE TITLE: WEB TECHNOLOGY					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	3	4	3	4	3	3	4	4	3.4	
CO2	4	4	4	4	4	3	3	3	3	4	3.6	
CO3	4	4	3	3	4	3	4	3	4	4	3.6	
CO4	4	4	3	3	4	4	3	3	4	3	3.5	
CO5	4	3	4	3	3	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<=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]**

Basics Of Internet Communication: Hardware elements associated with internet - Internet Services - Internet Protocols – TCP/IP, UDP, HTTP – Other Protocols – Telnet - Gopher- Mail and its types- FTP - Remote access - Web Indices – Search Engines.

UNIT – II **[12 Hrs]**

Introduction To HTML: Tags and Documents - Link documents using Anchor Tags – Images and Pictures – Tables – HTML Forms - Frames – Framesets.

UNIT – III **[12 Hrs]**

Introduction To Scripting: Java Script – Data types – Operators – Variables – Conditional Statements – Functions – Objects – Document object– Window Object – Event Handling.

UNIT – IV **[11 Hrs]**

Introduction To XML: Well-formed XML – CSS – XSL - Valid XML – DTD – XSD - Introduction to DOM and SAX Parsers.

UNIT – V **[13 Hrs]**

Introduction To Dynamic Web Applications: Server-Side Scripting basics – Server-Side Scripting Languages – PHP Scripting - General Syntactic Characteristics – Primitives, operations and expressions – Control Statement – Arrays – Functions – Pattern Matching – Form Handling – Files – Cookies – Session Tracking – Database access with PHP and MYSQL.

Text Books:

1. "Internet and WWW – How to program?", Deitel & Deitel - Pearson Education, 2005 (Units I, II and III)
2. "Programming the WWW", Robert W Sebesta – Pearson Education.2006 (Unit V)
3. "Beginning XML", David Hunter Et al – Wrox Publications 2000. (Unit IV)

Reference Books:

- "Internet Systems Handbook", Daniel C. Lynch, Marshall T. Rose - Addison Wesley 1993.
- "10 Minute Guide to the Internet", Peter Kent - Prentice Hall of India, 1996.
- "Teach Yourself XML in 21 days", Scott Mitchell and James Atkinson - - Sams Publishing, 1999.
- "Internetworking with TCP/IP", Douglas E.Comer, David L.Stevens (Second Edition)-2007.

I M.Sc(CS)	DISTRIBUTED COMPUTING	EPCS810
SEMESTER – II		HRS/WK – 4
ELECTIVE – 2A		CREDIT – 3

Objectives:

- To enable the student to be familiar with distributed systems and client server computing.
- To provide a clear description of the fundamental concepts and design principles that is applicable to a variety of distributed operating systems.

Course Outcomes (CO):

CO1: To understand the basic concepts of distributed systems
CO2: Outline the Client /server communication in distributed systems.
CO3: Demonstrate concurrency control and properties of transaction in Distributed Systems.
CO4: Ability to know about file accessing model and various services in Distributed System.
CO5: Understand the Resource Process Management and Distributed Shared Memory in distributed system

Relationship Matrix Course Outcomes, Programme Outcome and Programme Specific Outcome

SEMESTER II	COURSE CODE: EPCS810					COURSE TITLE: DISRIBUTED COMPUTING					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	2	3	4	3	3	3	2	4	3.0	
CO2	3	3	2	3	4	3	4	3	4	4	3.3	
CO3	3	3	2	4	3	3	3	4	3	3	3.1	
CO4	3	3	3	2	3	4	3	4	3	3	3.1	
CO5	3	3	3	3	4	3	3	4	3	3	3.2	
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<=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 **[10 Hrs]**

Introduction To Distributed Systems: Introduction – Goals - Hardware concept – Software Concepts – Design Issues: Transparency – Flexibility – Reliability – Performance – Scalability.

UNIT - II **[12 Hrs]**

Communication In Distributed Systems: The client –server model –Addressing - Types of Primitives – Implementation – Group communication – Introduction –Design Issues – Group communication in ISIS.

UNIT - III **[14 Hrs]**

Synchronization In Distributed Systems: Clock Synchronization – Mutual Exclusion -Election Algorithms –Atomic Transactions- Deadlocks.

UNIT - IV **[12 Hrs]**

Processes And Processors: Processes and Processors in Distributed Systems – Threads – Processor Allocation – scheduling – Fault Tolerance. Distributed File system – Design – Implementation – Trends in Distributed File systems.

UNIT - V **[12 Hrs]**

Distributed Shared Memory: Introduction – shared memory – consistency models – page – based distributed shared memory.

Text Books:

1. "Modern Operating Systems" Andrew S. Tanenbaum, Prentice Hall of India Pvt. Limited, New Delhi,1997
2. "An Introduction to Distributed and Parallel Processing" John A. Sharp, Blackwell Scientific Publications, 1987.

Reference Books:

1. "Distributed Databases Principles and systems" Stefans Ceri, Ginseppe Pelagatti, McGraw Hill Book Co., New York, 1985.
2. " Distributed systems: concepts & Design" George Coulouries, Pearson education Pvt. Ltd (Fourth edition- 2009), (Second Edition 2000).

I M.Sc(CS)	FUZZY LOGIC	EPCS810A
SEMESTER – II		HRS/WK – 4
ELECTIVE – 2B		CREDIT – 3

Objective:
This course presents a detailed knowledge of Fuzzy logic principles, sets, relations, systems and its applications.

Course Outcomes (CO):
After learning this course, the students should be able to expose
CO1: Ability to mathematically quantify knowledge, expertise and intuition, to model complex systems.
CO2: Ability to understand the basic knowledge of fuzzy relation and fuzzy set
CO3: Ability to acquire knowledge about the fuzzy logic and Fuzzy Expert Systems
CO4: Ability to apply basic fuzzy inference and approximate reasoning
CO5: Ability to apply in day-to-day life.

Relationship Matrix Course Outcome, Programme Outcome and Programme Specific Outcome

SEMESTER II	COURSE CODE: EPCS810A					COURSE TITLE: FUZZY LOGIC					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	4	4	4	5	4	5	4	3	4	5	4.2	
CO2	4	4	4	4	5	4	4	4	3	4	4.0	
CO3	4	4	4	4	4	4	4	4	4	4	4.0	
CO4	4	4	4	4	4	4	4	4	5	4	4.1	
CO5	4	4	5	4	4	4	4	4	4	3	4.0	
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 - I **[12 Hrs]**

Introduction: Crisp sets: an overview - Basic types of fuzzy sets - Basic Concepts of fuzzy sets-Characteristics and Significance - Fuzzy sets Vs Crisp sets - Additional properties of Alpha Cuts - Representation of Fuzzy sets - Extension principle for Fuzzy sets - Operations on Fuzzy Sets - types of operations- Fuzzy compliments, Union, Intersection - Combination of Operations - Aggregation Operations- Fuzzy Arithmetic - Fuzzy numbers - Linguistic variables - Arithmetic Operation on Intervals And Fuzzy numbers - Lattice of Fuzzy numbers - Fuzzy Equation.

UNIT – II **[12 Hrs]**

Fuzzy Relation: Fuzzy Relation - Crisp & Fuzzy Relations - Projections & Cylindric Extensions - Binary Fuzzy Relations - Binary Relations on a Single Set - Fuzzy Equivalence Relations - Fuzzy Compatibility Relations - Fuzzy Ordering Relations - Fuzzy Morphisms - Compositions of Fuzzy Relation - Fuzzy Relation Equations - General Discussion - Problem Partitioning - Solution Method - Fuzzy Relation Equation Based on Sup_i&Inf_i Completions - Approximate Solutions - The use of Neural Networks - Possibility Theory - Fuzzy Measures - Evidence Theory - Possibility Theory - Fuzzy Sets & Possibility Theory - Possibility Theory Vs Probability Theory.

UNIT – III **[13 Hrs]**

Fuzzy Logic: Fuzzy Logic - Classical logic - Multi valued Logic - Fuzzy Propositions & Quantifiers - Linguistic Hedges - Inference from Conditional Fuzzy Propositions - Inference from Conditional & Qualified Propositions - Inference from Quantified Propositions - Uncertainty Based Information - Information & Uncertainty - Non specificity of Crisp Sets & Fuzzy sets- Fuzziness of Fuzzy sets - Uncertainty in Evidence Theory - Uncertainty Measures - Principles of Uncertainty - Approximate Reasoning - Fuzzy Expert Systems - Fuzzy Implication & Its selections - Multi conditional Approximate Reasoning - The Role of Fuzzy Relation Equations - Interval Valued Approximate Reasoning.

UNIT – IV **[12 Hrs]**

Fuzzy Systems: Fuzzy Systems - General Discussion - Overview of Fuzzy Controllers and Example - Fuzzy systems & Neural Networks - Fuzzy Neural Networks - Fuzzy Automata- Fuzzy Dynamic Systems - Pattern Recognition - Introduction - Fuzzy clustering - Fuzzy Pattern Recognition - fuzzy Image Processing-Fuzzy Databases & Information Retrieval Systems - General Discussion - Fuzzy Databases -Fuzzy Information Retrieval.

UNIT – V **[11 Hrs]**

Applications: Engineering & Other applications - Introduction - Civil Engineering - Mechanical Engineering - Industrial Engineering - Computer Science Engineering - Reliability Theory - Robotics - Medicine - Economics - Decision Making - Fuzzy Systems & Genetic Algorithms - Fuzzy Regression - Interpersonal Communication.

Text book:

1. "Fuzzy Sets and Fuzzy Logic Theory and Applications", George J. Klir & Bo Yuan-Prentice Hall, India.1995

Reference book:

1. "Fuzzy Sets Uncertainty & Information", George J. Klir & Tina A. Folger-PHI, 2001.
2. "Neuro - Fuzzy and Soft Computing ",J.S.R.Jang, C.T.Sun, E.Mizutani- PHI, 2003.

I M.Sc(CS)	GRID COMPUTING	EPCS810B
SEMESTER – II		HRS/WK – 4
ELECTIVE – II C		CREDIT – 3

Objective:
To impart knowledge related to the various concepts, methods of Grid computing with grid benefits, components, and standards support grid computing techniques.

Course Outcomes (CO):
CO1: Understand the basic concept of Grid Computing.
CO2: Gain knowledge on the concepts of Grid Benefits & Status of Technology.
CO3: Understand the concept of Components of Grid Computing Systems
CO4: Ability to know Grid computing Architecture & its Drawbacks.
CO5: Understand the Concept of Grid Computing Standards and Service Elements and Components of OGSA Services

Relationship Matrix Course Outcome, Programme Outcome and Programme Specific Outcome

SEMESTER II	COURSE CODE: EPCS810B					COURSE TITLE: GRID COMPUTING					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	2	4	3	4	3	3	4	3.1	
CO2	3	4	4	3	4	3	3	3	3	4	3.4	
CO3	3	3	4	3	4	3	3	3	2	4	3.2	
CO4	3	2	3	3	3	3	3	2	4	4	3.0	
CO5	3	3	3	4	3	3	3	2	3	3	3.0	
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<=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: Grid Computing & Key Issues-Applications-Other Approaches-Grid Computing Standards-Grid Topology-Component s& Layers-Pragmatic Course of Investigation.

UNIT- II **[12 Hrs]**

Goal Benefits & Status Of Technology: Motivations-History of Computing, Communications and Grid Computing –Grid Computing Prime Time-Suppliers and Vendors- Economic Value-Challenges

UNIT- III **[12 Hrs]**

Components Of Grid Computing Systems & Architecture: Basic Constituent Elements-A Functional view-A Physical View-Service View.

UNIT-IV **[12 Hrs]**

Grid Computing Standards-OGSI: Standardization-Architectural Constructs - Practical view-OGSA/OGSI Service Elements and Layered Model-More Detailed View.

UNIT-V **[12 Hrs]**

Standards Supporting Grid Computing-OGSA: Functionality Requirements - OGSA Service Taxonomy-Service Relationships-OGSA Services-Security Considerations.

Text Book:

1. "A Networking Approach to Grid Computing", Daniel Minoli-Wiley publications-2004

Reference Book:

1. "Grid Computing-A practical Guide to Technology & Applications", Ahmar Abbas-Charles River Media Publications-2004

II-MSC (CS)	**PYTHON PROGRAMMING** **For the students admitted from the year 2021**	**21PCSP23**
SEMESTER – II		**HRS/WK – 5**
CORE PRACTICAL–III		**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 (CO):

CO1: To Learn the Simple programs of Python
CO2. Learn the Basic Syntax of Python
CO3. Learn about the Strings, Lists, Tuples and Dictionary in Python
CO4. Acquired an idea about Control Structures in Python
CO5. Understood the Defining a Function – Calling a Function

Relationship Matrix Course Outcome, Programme Outcome and Programme Specific outcome

SEMESTER II	COURSE CODE: 21PCSP23					COURSE TITLE: PYTHON 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	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

PYTHON PROGRAMMING

1. Write a Simple program in python.
2. Write a python program to Check Armstrong Number.
3. Write a python program to implement conditional branching.
4. Write a python program to implement loop structure.
5. Write a Python program to remove the nth index character from a nonempty string.
6. Write a Python program to find the second smallest number in a list.
7. Write a python program using tuples.
8. Write a Python program to find the highest 3 values of corresponding keys in a dictionary.
9. Write a Python program to find the factorial of a number using recursive function.
10. Write a program for Simple Calculator

WEB REFERENCE:

//www.programiz.com/python-programming

I M.Sc(CS)	WEB TECHNOLOGY LAB	19PCSP24
SEMESTER – II		HRS/WK – 5
CORE PRACTICAL – IV		CREDIT –3

Objective:
To develop applications using HTML, XML and PHP.

Course Outcomes (CO):
CO1: Create a HTML table with rows and columns and split them using Row span and Col span.
CO2: Understand and create web pages using text links and align them.
CO3: Acquire knowledge to create XML documents, write a XSL style sheet and validate them using DTD or XSD.
CO4: Understand and write PHP programs for storage and retrieval of data from MYSQL.
CO5: Create java script programs and illustrate its various concepts.

Relationship Matrix Course Outcome, Programme Outcome and Programme Specific Outcome

SEMESTER II	COURSE CODE:19PCSP24					COURSE TITLE: WEB TECHNOLOGY LAB					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	3	4	3	4	3	4	4	4	4	3	3.6	
CO2	4	4	3	4	3	4	3	4	3	3	3.5	
CO3	4	3	3	4	4	4	4	3	3	4	3.6	
CO4	4	3	4	3	3	3	4	3	4	4	3.5	
CO5	3	4	4	3	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 Specific Outcome

WEB TECHNOLOGY LAB

1. Create a HTML table with rows and columns and split them using Row span and Col span.
2. Create a web page in the format of front page of a news paper using Text links. Align the text with colors.
3. Write a HTML program for new email account registration. Validate the input using Java Script.
4. Write an XML document to display your bio-data. Write an XSL style sheet and attach that to the XML document. Validate the document using DTD or XSD.
5. Write a server-side PHP program that displays marks, total, grade of a student in tabular format by accepting user inputs for name, number and marks from a HTML form.
6. Write a PHP program to access the data stored in a mysql table.
7. Develop a simple Web page using Html and JavaScript about your college.
8. Write a JavaScript Program to prepare a salary slip for an Employee
9. Write a JavaScript Program to illustrate the use of String Functions
10. Write a JavaScript Program to illustrate the use of Mathematical Functions and Date Functions.

WEB REFERENCES:

1. https://www.w3schools.com/html/html_examples
2. https://beginnersbook.com/2018/10/xml-example
3. https://www.codewithc.com/category/projects/php-projects

II M.Sc (CS)	DATA MINING AND WAREHOUSING For the students admitted from the year 2008	PCS911
SEMESTER – III		HRS/WK – 4
CORE – 9		CREDIT – 3

Objective:
This course enables us to understand the concepts of Data Warehousing and Data Mining and its applications.

Course Outcomes (CO):
After learning this course, the students should be able to expose
CO1: Ability to know the data mining introduction and classification of data mining system
CO2: Ability to understand the principles of knowledge discovery process
CO3: Ability to acquire knowledge about Data Warehouse Architecture
CO4: Ability to apply classification and prediction
CO5: Ability to learn the Data warehouse scoping and planning

Relationship Matrix Course Outcome, Programme Outcome and Programme Specific Outcome

SEMESTER III	COURSE CODE: PCS911					COURSE TITLE:DATAMINING AND WAREHOUSING					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	4	4	2	4	3	4	4	3	2	4	3.4	
CO2	4	4	2	4	4	5	4	3	2	4	3.6	
CO3	4	3	3	4	3	4	4	3	3	4	3.4	
CO4	4	4	2	4	4	3	4	3	3	4	3.5	
CO5	4	4	2	4	4	4	4	3	2	4	3.5	
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 **[10 Hrs]**

DATA MINING INTRODUCTION: Data mining –Introduction-classification of data mining system-Data mining Vs Data Base-Application of data mining-Data mining functionalities- Integration of data mining system with the data warehouse system.

UNIT- II **[12 Hrs]**

KNOWLEDGE DISCOVERY PROCESS: Knowledge Discovery Process-Data cleaning: missing values-noisy data-data cleaning as a process-Data Integration and Transformation-Data Reduction-Types of OLAP servers: ROLAP Vs MOLAP Vs
HOLAP- Decision trees- Neural network- Genetics algorithms.

UNIT- III **[13 Hrs]**

DATA WAREHOUSE ARCHITECTURE: Steps for the design and construction of data warehouses-A three tier data warehouse architecture –data warehouse back-End Tools and utilities-metadata repository-From data warehousing to data mining-From online analytical processing to online analytical mining-Data warehouse implementation-Efficient computation of data cubes.

UNIT- IV **[13 Hrs]**

CLASSIFICATION AND PREDICTION: Bayesian classification- Baye's theorem-Rule based classification: Using IF-THEN rules for classification-Rule Extraction from a decision tree-Prediction-Cluster Analysis-Types of data in cluster analysis.

UNIT- V [12 Hrs]

PLANNING: Data warehouse scoping and planning –Testing and implementation of data warehouse – Advantages of Data warehousing –Disadvantages of data warehousing.

Text Book:

1. "Data Mining Concepts And Techniques", Jiawei Han and Micheline Kamber -Morgan Publishers (second edition),2006

Reference Book:

1. "Data Mining ",Pieter Adrians ,DolfZantiage ,Addison Wesley,1996
2. "Data Warehousing in the real world", Sam Anahory, Dennis Murrey, AddisonWesley, 1996.
3. "Data Warehousing-Concepts, Techniques, Products & Applications", C.S.R Prabhu,PHI Second Edition, 2002.

II-MSC (CS)	BASICS OF MACHINE LEARNING For the students admitted from the year 2021	21PCS912
SEMESTER – III		HRS/WK – 4
CORE –10		CREDIT – 4

Objectives:

- This course introduces students to understand fundamentals of Machine Learning.
- At the end of the course, students should have an understanding of Machine Learning and its various importance in Research.
- Students will also be aware of the utilization of Machine Learning in building dynamics of Knowledge.

Course Outcomes (CO):

CO1: Essential knowledge on Machine Learning.
CO2. Learn the Basics of Machine Learning and its concepts.
CO3. Acquire the fundamental knowledge on building Machine Learning programs.
CO4. Develop an idea about Machine Learning Algorithms
CO5. Understand and develop Research Application using Machine Learning.

Relationship Matrix Course Outcome, Programme Outcome and Programme Specific outcome

SEMESTER III	COURSE CODE: 21PCS912					COURSE TITLE: BASICS OF MACHINE LEARNING					HOURS: 4	CREDITS: 4
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	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 -I **[12Hrs]**

INTRODUCTION: Introduction to Machine Learning – Importance of Machine Learning in Research - Applications of Machine Learning – Categories of Machine Learning Techniques – Trends in Machine Learning.

UNIT- II **[12Hrs]**

SUPERVISED LEARNING: Introduction to Supervised Techniques - Algorithms for Supervised Learning - k-Nearest Neighbors - Decision Trees - Naive Bayes- Logistic Regression- Support Vector Machines.

UNIT- III **[13Hrs]**

UNSUPERVISED LEARNING: Introduction to Unsupervised Techniques - Algorithms for Unsupervised Learning- K-Means Clustering Algorithms –Hierarchical Clustering Algorithms – Difference between Supervised and Unsupervised Algorithms.

UNIT- IV **[11Hrs]**

ARTIFICIAL NEURAL NETWORKS: Multilayer Perceptron - The Perceptron - Training a Perceptron - Learning Boolean Functions - MLP as a Universal Approximator – Back propagation Algorithm - Nonlinear Regression - Two-Class Discrimination - Multiclass Discrimination - Multiple Hidden Layers.

UNIT- V **[12Hrs]**

DESIGN AND ANALYSIS OF MACHINE LEARNING EXPERIMENTS: Guidelines for Machine Learning Experiments - Cross-Validation and Resampling Methods - Measuring Classifier Performance - Interval Estimation - Hypothesis Testing - Assessing a Classification Algorithm's Performance - Comparing Multiple Algorithms: Analysis of Variance.

TEXT BOOK:

1. "Introduction to Machine Learning", Ethem Alpaydın, Second Edition, The MIT Press, 2010.

REFERENCE BOOKS:

1. "Machine Learning for Absolute Beginners", Oliver Theobald, Second Edition, Oliver Theobald Publications, 2017.
2. Andreas C. Müller & Sarah Guido, "Introduction to Machine Learning with Python", O'Reilly Publications, 2017.

II M.SC (CS)	CLOUD COMPUTING	PCS913P
SEMESTER – III		HRS/WK – 4
CORE – II		CREDIT – 3

Objective:
To impart the basic concepts of Cloud Computing and its applications**.**

Course Outcomes (CO):
CO1: To understand the basic concepts of Cloud Computing
CO2: Understand the concept of Infrastructure as a service in cloud
CO3: Ability to Design & develop backup strategies for cloud data based on features.
CO4: Gain idea about the Cloud with Map Reducing concept.
CO5: Ability to understand the concept of security and key components of AWS

Relationship Matrix Course Outcome, Programme Outcome and Programme Specific Outcome

SEMESTER III	COURSE CODE:PCS913P					COURSE TITLE: CLOUD COMPUTING					HOURS: 4	CREDITS: 3
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	3	3	3	2	4	3	3	2	3	4	3.0	
CO2	3	4	3	4	4	3	3	2	3	4	3.3	
CO3	3	3	4	3	3	3	3	2	4	3	3.1	
CO4	4	3	4	3	3	3	3	3	2	3	3.1	
CO5	3	3	4	3	4	3	4	3	3	4	3.4	
Mean Overall Score											3.2	

Result: The 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 Outcome and Programme Specific Outcome

UNIT -I **[12Hrs]**

Introduction To Cloud Computing: Roots of Cloud Computing -Layers and Types of Cloud - Features of a Cloud - Infrastructure Management- Cloud Services - Challenges and Risks - Migrating into a Cloud: Introduction - Broad Approaches - Seven Step Model - Integration as a Service - Integration Methodologies - SaaS.

UNIT-II **[12Hrs]**

Infrastructure As A Service: Virtual Machines - Layered Architecture - Life Cycle – VM Provisioning Process - Provisioning and Migration Services - Management of Virtual Machines Infrastructure - Scheduling Techniques - Cluster as a Service - RVWS Design - Logical Design - Cloud Storage – Data Security in Cloud Storage - Technologies.

UNIT- III **[12Hrs]**

Platform And Software As A Service: Integration of Public and Private Cloud - Techniques and Tools - Framework Architecture –Resource Provisioning Services - Hybrid Cloud - Cloud Based Solutions for Business Applications - Dynamic ICT Services - Importance of Quality and Security in Clouds - Dynamic Data Center - Case Studies - Workflow Engine in the Cloud - Architecture - Utilization - Scientific Applications for Cloud – Issues - Classification - SAGA - Map Reduce Implementation.

UNIT- IV **[12Hrs]**

MONITORING AND MANAGEMENT: An Architecture for Federated Cloud Computing - Use Case - Principles - Model - Security Considerations – SLA Management - Traditional Approaches to SLO - Types of SLA - Life Cycle of SLA - Automated Policy - Performance Prediction of HPC - Grid and Cloud - HPC Performance Related Issues.

UNIT- V **[12Hrs]**

APPLICATIONS: Best Practices in Architecting Cloud Applications in the AWS Cloud - Massively Multilayer Online Game Hosting on Cloud Resources - Building Content Delivery Networks using Clouds – Resource cloud Mashups

Text Book:

1. "Cloud Computing Principles and Paradigms", Rajkumar Buyya, James Broberg and Andrzej Goscinski, Wiley Publications, 2011

Reference Books:

1. "Cloud Application Architectures" George Reese, Shroff O'reilly, ISBN: 8184047142, 2009.
2. "Cloud Computing Web Based Applications that change the way you work and collaborate online", Michael Miller - Pearson Education, 2009.

II M.SC (CS)	PRINCIPLES OF COMPILER DESIGN For the students admitted in the year 2015	EPCS914T
SEMESTER – III		HRS/WK – 4
ELECTIVE – 3A		CREDIT – 3

Objectives:

To understand the Various phases of a compiler and to develop skills in designing a compiler.

Course Outcomes (CO):

CO1: Apply skills and familiarity which are applicable to a broad range of computer applications.
CO2: Design and develop a comprehensive Compiler for a given language
CO3: Implement various parsing, conversion, optimization and code generation algorithms for the design of a compiler.
CO4: Understand the concept parsing techniques
CO5: Able to understand the memory allocation with Loop Optimization and DAG

Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes

SEMESTER III	COURSE CODE: EPCS914T					COURSE TITLE:PRINCIPLES OF COMPILER DESIGN					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	4	4	4	4	4	4	4	4	3	3	3.8	
CO2	3	4	3	4	4	4	4	4	3	4	3.7	
CO3	3	4	3	4	3	4	4	4	3	4	3.6	
CO4	4	3	3	4	3	4	4	4	3	4	3.6	
CO5	4	4	4	4	4	4	4	4	4	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 **[11 Hrs]**

COMPILER- Phases of Compiler – Lexical Analysis – Role of Lexical analyzer – Finite Automata – Regular Expression – From a Regular expression to an NFA , NFA to DFA – Design of Lexical Analyzer.

UNIT- II **[13 Hrs]**

SYNTAX ANALYZER - CFG – Role of the Parser – CFG – Top Down Parsing – Recursive descent parsing, predictive Parsers – Bottom up Parsing – Shift reduce, operator precedence parsers

UNIT- III **[12 Hrs]**

SYNTAX DIRECTED DEFINITION- Construction of Syntax trees – Intermediate code generation – Intermediate Languages – Syntax trees, post fix form, Three address code – Boolean expressions.

UNIT- IV

[**12 Hrs**]

SYMBOL TABLE- contents of Symbol table – Implementation of Stack allocation scheme – Storage allocation.

UNIT - V **[12 Hrs]**

CODE OPTIMIZATION AND CODE GENERATION- principles sources of optimization – loop optimization – Dag Representation of Basic blocks. CODE GENERATION-simple code generator.

Text Book:

1. Compilers Principles, Techniques and Tools Alfred V.Aho, Ravi Sethi, Jeffrey D. Ullman.
   Chapter 1 : (1.1,1.3), Chapter 3: (3.1,3.6,3.7,3.9), Chapter 4: (4.1,4.2,4.4 – 4.6),
   Chapter 5: (5.1,5.2), Chapter 7: (7.5), Chapter 8: (8.1,8.4)

Reference Book:

1. Principles of Compiler Design Alfred V.Aho and Jeffrey D.Ullman.
   Chapter 9: (9.1,9.2), Chapter 10: (10.1,10.2,10.3),
   Chapter 12: (12.1,12.2,12.3), Chapter 15: (15.2,15.4,15.5,15.7)

II M.SC (CS)	MOBILE COMPUTING	EPCS914S
SEMESTER – III		HRS/WK – 4
ELECTIVE – 3B		CREDIT – 3

Objectives:

- To provide basics for various techniques in Mobile Communications.
- To build working knowledge on various telephone and satellite networks.
- To study the working principles of wireless LAN and its standards.
- To build skills in working with Wireless application Protocols to develop mobile content applications.

Course Outcomes (CO):

After learning this course, the students should be able to expose

CO1: Ability to gain knowledge on basis of mobile computing and MAC
CO2: Ability to acquire knowledge on multiple Telecommunication systems
CO3: Ability to access wireless LAN, Bluetooth
CO4: Ability to gain idea on IP, Tunneling and reverse tunneling
CO5: Ability to understand WAP, its Architecture, WML.

Relationship Matrix Course Outcome, Programme Outcome and Programme Specific Outcome

SEMESTER III	COURSE CODE:EPCS914S					COURSE TITLE: MOBILE COMPUTING					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	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	
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 **[12 Hrs]**

INTRODUCTION: Mobile and Wireless Devices-Simplified Reference Model-Need for Computing- Multiplexing-Spread Spectrum and Cellular Systems-Medium Access Control-Comparisons.

UNIT- II **[12 Hrs]**

TELECOMMUNICATION SYSTEMS: Telecommunication systems – GSM – Architecture-Protocols- Hand Over and Security – Satellite Networks - Satellite Systems.

.

UNIT- III **[13 Hrs]**

WIRLESS LAN: IEEE 802.11– System Architecture – Protocol Architecture – Blue Tooth – MAC layer –Security and Link Management.

UNIT- IV **[12 Hrs]**

MOBILE IP: Goals– Packet Delivery– Agent Advertisement and Solicitation – Registration - Tunneling and Reverse Tunneling.

UNIT -V **[11 Hrs]**

WIRELESS APPLICATION PROTOCOL: Objectives of WAP– Architecture of WAP – WML Features-WML Script.

TEXT BOOK:

1. "Mobile Communications", Jochen Schiller- PHI/Pearson Education (2nd Edition).Delhi, 2000.

REFERENCE BOOKS:

1. "The Wireless Application Protocol: Writing Applications for the Mobile internet", Sandeep Singhal, Thomas Bridgman, Lalitha Suryanarayana, Danil Mouney, Jari Alvinen, David Bevis, Jim Chan and Stetan Hild-Pearson Education Delhi,2001.

2. "Mobile Computing", Asoke K Talukder, Roopa R Yavagal- TMG,2006.

II M.Sc (C.S)	DIGITAL IMAGE PROCESSING	EPCS914A
SEMESTER –III		HRS/WK-4
Elective – 3C		CREDIT-3

Objectives:

- Digital image Processing is an area which is ever growing in the research side.
- It improves the student's perspective on research side with an eye opener on Digital image processing.

Course Outcomes (CO):

After learning this course, the students should be able to expose

CO1: Ability to gain knowledge on basic fundamentals of Digital Image Processing
CO2: Ability to acquire knowledge about Image Enhancement
CO3: Ability to know about Image Restoration
CO4: Ability to gain idea on Geometric Transforms
CO5: Ability to understand Image Compression.

Relationship Matrix Course Outcome, Programme Outcomes and Programme Specific Outcome

SEMESTER III	COURSE CODE: EPCS914A					COURSE TITLE: Digital Image Processing					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	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

UNIT- I **[10 Hrs]**

INTRODUCTION: Examples of fields that use digital image processing, fundamental steps in digital image processing, components of image processing system. Digital Image Fundamentals: A simple image formation model, image sampling and quantization, basic relationships between pixels. (p.nos. 15-17, 21- 44, 50-69).

UNIT- II **[14 Hrs]**

IMAGE ENHANCEMENT IN THE SPATIAL DOMAIN: Basic gray-level transformation, histogram processing, enhancement using arithmetic and logic operators, basic spatial filtering, smoothing and sharpening. (p.nos.76-141).

UNIT- III **[12 Hrs]**

IMAGE RESTORATION: A model of the image degradation/restoration process, noise models, restoration in the presence of noise–only spatial filtering, Weiner filtering.

UNIT- IV **[12 Hrs]**

GEOMETRIC TRANSFORMS: Introduction to the Fourier transform and the frequency domain, estimating the degradation function (p. nos147-167,220-243,256-276).

UNIT- V **[12 Hrs]**

IMAGE COMPRESSION: Fundamentals, image compression models, error-free compression. (p.nos: 409-467,492-510).

Text Book:

1. Rafeal C. Gonzalez, Richard E. Woods, Digital Image Processing, , Second Edition, Pearson Education/PHI.

Reference Books:

1. "Image Processing, Analysis, and Machine Vision", Milan Sonka, Vaclav Hlavac and Roger Boyle- Thomson Learning (Second Edition),2007
2. "Compute Vision and Image Processing ", Adrian Low-B. S. Publications (Second Edition),2014
3. "Digital Image Processing", William K. Prat , - Wily Third Edition,2010
4. "Digital Image Processing and Analysis", Chanda, D. Datta Majumder - Prentice Hall of India, 2003.

II M.SC (CS)	RESEARCH METHODS	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 and also to develop broad comprehension of research area

Course Outcomes (CO):

CO1: Understand and acquire the basics knowledge about research methodology and the 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 Specific Outcome

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 Research Design-Types-Principles.

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

UNIT- III **[13Hrs]**

Data Collection: Methods of Data Collection – Collection of primary data – Collection of 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 Correlation and 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), New Delhi, New Age International (P) Limited, 2003.

Reference Book:

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

II M.Sc (C.S)	CYBER FORENSICS	19EPCS35A
SEMESTER –III		HRS/WK-4
Elective – 4B		CREDIT-3

Objectives:

- To Explain the responsibilities and liabilities of a computer forensic investigator
- To collect digital evidences from a crime scene without damaging it or risking it becoming inadmissible in a court of law

COURSE OUTCOMES (CO):

After learning this course, the students should be able to expose

CO1: Ability to gain knowledge on basic Forensics, its tasks, cybercrime laws
CO2: Ability to restrict from crimes, threat and fraud by learning social ethics
CO3: Ability to learn about cyber criminals, crime fighters and understanding investigators
CO4: Ability to understand local, state, national, international laws and their procedures
CO5: Ability to understand how to preserve and recover digital evidence.

Relationship Matrix Course Outcome, Programme Outcome and Programme Specific Outcome

SEMESTER III	COURSE CODE: 19EPCS35A					COURSE TITLE:CYBER FORENSICS					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	4	4	4	4	4	4	5	3	2	5	3.9	
CO2	4	4	4	4	4	4	5	4	3	5	4.1	
CO3	4	4	4	4	4	4	5	4	3	5	4.1	
CO4	4	4	4	4	4	4	5	3	3	5	4.0	
CO5	4	4	4	4	4	4	5	3	2	5	3.9	
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 **[Hrs 11]**

INTRODUCTION TO COMPUTER FORENSICS: Computer forensics definitions - Computers' roles in crimes- Computer forensics tasks-Prepare for an investigation- Collect evidence -Preserve evidence -Recover evidence- Document evidence Challenges associated with making "cybercrime" laws-Jurisdictional issues.

UNIT-1I **[Hrs 12]**

COMPUTER CRIMES: Crimes -Violent crimes where computers are used include terrorism - assault threat- stalking- child pornography -Nonviolent crimes where computers are used include trespass- theft- fraud- vandalism -Where evidence often resides for different types of crimes -Address books- chat logs- e-mail- images- movies- Internet browser history- etc.

UNIT-1II **[Hrs 12]**

COMPUTER CRIMINALS: Using evidence to create a crime timeline - Modify Access Create (MAC) dates associated with files- Problems with using these (they don't change in a logical fashion in some cases)-Criminals and crime fighters- Understanding "cyber criminals" and their victims -Understanding "cyber investigators.

UNIT-1V **[Hrs 13]**

BUILDING A CYBERCRIME CASE: Bodies of law- Constitutional law- Criminal law - Civil law- Administrative regulations- Levels of law- Local laws- State laws- Federal laws - International laws- Levels of culpability- Intent –Knowledge- Recklessness- Negligence- Level and burden of proof- Criminal versus civil cases- Vicarious liability- Laws related to computers –CFAA- DMCA- CAN Spam- etc.

UNIT-V **[Hrs 12]**

PRESERVING AND RECOVERING DIGITAL EVIDENCE Disk imaging -Creating a message digest or hash code for a disk -Where data hides; deleted and erased data -File systems –Files-Modify Access Create (MAC) dates to establish time line -File headers - info about file type.

Text Book :

1. "Guide to Computer Forensics and Investigations", Bill Nelson, Amelia Phillips, Christopher Steuart, - 4th edition, Course Technology- Cengage Learning, 2010

Reference Book:

1. "Computer Crime Scene Investigation", John R. Vacca, Computer Forensics-2nd Edition, Charles River Media, 2005

I M.Sc (C.S)	E –BUSINESS	19EPCS35B
SEMESTER –III		HRS/WK-4
ELECTIVE – 4C		CREDIT-3

Objectives:

- This course introduces students to various aspects and models for E-Business.
- At the end of the course, students should have an understanding of the impacts which E-Business is having on society, markets and commerce.
- Students should also become aware of the global nature of E-commerce and how traditional means of doing business will need to change in the electronic age.

Course Outcomes (CO):

CO1: Essential knowledge on Business Process Model
CO2. Learn the working environment functions for E Market places
CO3. Learn about the E Business Applications of Outsourcing Industry
CO4. Acquired an idea about employment and job Market online different field and Industries
CO5. Understood the challenges and dynamics of each E-Learning process Education and Industries to help better manage operations

Relationship Matrix Course Outcome, Programme Outcome and Programme Specific Outcome

SEMESTER III	COURSE CODE:19EPCS35B					COURSE TITLE: E-BUSINESS					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	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-I **[Hrs 12]**

INTRODUCTION TO E-BUSINESS AND E-COMMERCE- Define the E-Commerce and E-Business - Define E-Commerce Types of EC transactions - Define E-Business Models - Internet Marketing and E-Tailing - Elements of E-Business Models- Explain the benefits and limitations of E-Commerce.

UNIT-II **[Hrs 12]**

E-MARKETPLACES- Structures, Mechanisms, Economics, and Impacts- Define E- Marketplace and Describe their Functions- Explain E-Marketplace types and their features - Describe the various types of auctions and list their characteristics - Discuss the benefits, limitations and impacts of auctions - E-Commerce in the wireless environment - Competition in the DE and impact on industry

UNIT- III **[Hrs 11]**

E-BUSINESS APPLICATIONS- E-Procurement and E-Payment Systems - Integration and E- Business suits - ERP, E-SCM, CRM - E-Procurement definition, processes, methods and benefits - E-Payment - Discuss the categories and users of smart cards - Describe payment methods in B2B EC.

UNIT-IV **[Hrs 12]**

THE IMPACT OF E-BUSINESS ON DIFFERENT FIELDS AND INDUSTRIES - E-Tourism - Employment and Job Market Online - Online Real Estate - Online Publishing and E-Books - Banking and Personal Finance Online - On-Demand Delivery Systems and E-Grocers - Online Delivery of Digital Products, Entertainment, and Media

UNIT-V **[Hrs 13]**

E-LEARNING AND ONLINE EDUCATION - Define electronic learning-Discuss the benefits and drawbacks of E-Learning.

THE E-LEARNING INDUSTRY- Discuss E-Content development and tools-Describe the major technologies used in E-Learning- Discuss the different approaches for E-Learning Delivery-How E-Learning can be evaluated. Future Trends-e-Government- Definition of E-Governments-Implementation-E-Government Services- Challenges and Opportunities- E-Government Benefit.

Text Book:

1. "Electronic Commerce: A Managerial Perspective", Turban, E. et al., -Prentice Hall 2008.

Reference Books:

1. "Electronic Business and Electronic Commerce Management", Dave Chaffey, 2nd edition, Prentice Hall, 2006
2. "E-Learning Tools and Technologies", Horton and Horton-Wiley Publishing, 2003

II-MSC (CS)	**MACHINE LEARNING USING PYTHON** **For the students admitted from the year 2021**	**21PCSP35**
SEMESTER – III		**HRS/WK – 5**
CORE – PRACTICAL-V		**CREDIT – 3**

Objectives:

- This course introduces students to understand basics of Machine Learning with Python.
- Students will also be program and build simple and efficient Machine Learning logic in Python.

Course Outcomes (CO):

CO1: Essential knowledge on Machine Learning Algorithms.
CO2. Learn the Basics of Machine Learning and its concepts.
CO3. Acquire the fundamental knowledge on building Machine Learning programs.
CO4. Develop an idea about Machine Learning Algorithms
CO5. Understand and develop Research Application using Machine Learning.

Relationship Matrix Course Outcome, Programme Outcome and Programme Specific outcome

SEMESTER III	COURSE CODE: 21PCSP35					COURSE TITLE: MACHINE LEARNING USING PYTHON					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	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

MACHINE LEARNING USING PYTHON

1. Implement k-Nearest Neighbors Algorithm
2. Implement Decision Trees Algorithm
3. Implement Naive Bayes Algorithm
4. Implement Logistic Regression Algorithm
5. Implement Support Vector Machines Algorithm
6. Implement K-Means Algorithm
7. Implement Hierarchical Clustering Algorithm
8. Implement Neural Network Algorithms
9. Implement Cross-Validation and Resampling Methods
10. Implement Classification Algorithms

WEB REFERENCE:

1. https://medium.com/coders-camp/60-python-projects-with-source-code

II M.Sc (CS)	MINI PROJECT	19JPC306
SEMESTER – III		HRS/WK-3
MINI PROJECT		CREDIT – 3

Objective:

The main objective of this Mini project is to expose the students to get a broad idea to develop project.

Course Outcomes (CO):

CO1: Ability to perform Critical Thinking, Reasoning, and Creative Thinking.
C02: Ability to use the technology
C03: Ability to visualize the problems and Provide Solution
C04: Ability to test technical skills.
C05: Ability to work both independently and in groups on presentations and/or development of Projects.

SEMESTER III	COURSE CODE: 19JPC306					COURSE TITLE: MINI PROJECT								HOURS: 3	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	5	4	5	5	4	4	4	4	4	3	4	4	4	4.10	
CO2	5	4	5	5	4	4	4	4	5	3	4	4	4	4.20	
CO3	5	5	5	5	5	5	5	4	5	3	4	4	4	4.50	
CO4	5	5	5	5	5	5	5	4	5	3	4	4	4	4.50	
CO5	5	5	5	5	5	5	5	4	5	3	4	4	4	4.50	
Mean Overall Score														4.4	

Result: The Score of this Course is 4.4(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

FORMAT FOR PREPARING MINI PROJECT REPORT

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
APPENDIX- B

BINDING SPECIFICATION

- Report should be found using flexible cover of thick white Art Paper.
- The Spine for the Bound volume should be of black calico of 2cms width.
- The Cover should be printed in Block letters.

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. Papers of main Text, starting with Chapter-1, Should be consecutively numbered using Arabic Numerals.

II-MSC (CS)	**PROJECT**	**JPCS1016**
SEMESTER – IV	**For the students admitted from the year 2008**	**HRS/WK–30**
PROJECT		**CREDIT– 22**

Objective:

- The main objective of this Main project is to expose the student to gain knowledge on software development from Industries.

COURSE OUTCOMES (CO):

CO1: Ability to perform Critical Thinking, Reasoning, and Creative Thinking.
C02: Ability to use the technology
C03: Ability to visualize the problems and Provide Solution
C04: Ability to test technical skills.
C05: Ability to work both independently and in groups on presentations and/or development of Projects.

SEMESTER IV	COURSE CODE: JPCS1016					COURSE TITLE: PROJECT								HOURS : 30	CREDITS: 22
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		
CO1	5	4	5	5	4	4	4	4	4	3	4	4	4	4.10	
CO2	5	4	5	5	4	4	4	4	5	3	4	4	4	4.20	
CO3	5	5	5	5	5	5	5	4	5	3	4	4	4	4.50	
CO4	5	5	5	5	5	5	5	4	5	3	4	4	4	4.50	
CO5	5	5	5	5	5	5	5	4	5	3	4	4	4	4.50	
Mean Overall Score														4.4	

Result: The Score of this Course is 4.4(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

FORMAT FOR PREPARING MAIN PROJECT REPORT

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

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PAGE NUMBERING

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