KOVAI KALAIMAGAL COLLEGE OF ARTS AND SCIENCE

(An Autonomous Institute Affiliated to Bharathiar University)

Re - accredited with "A+" grade by NAAC

Regulations for Undergraduate Programmes

(Under Choice Based Credit System)

(Effective for 2024 – 2026 Batch)

1. REGULATIONS

This regulation is effective for the batch 2024 -2026

1.1. Eligibility for Admission

Course	***Eligibility Condition***
MSc Computer Science MSc Information Technology	BSc Computer Science / Computer Technology / Information Technology / Software Systems / BCA / BSc Applied Science (IT / CT) / Software / Computer Science and Application / BSc Triple Major (BSc Triple Major (Mathematics , Statistics , Computer Science)
MCom Computer Application	BCom or BCom with any specialization (Branch)
MCom International Business	A Pass in any Degree

1.2. Duration and Course of Study

Two Academic years with four semesters, the duration of the first and third Semesters from June to November and the second and fourth Semesters from December to April. The duration of each semester is 90 working days.

1.3. The Medium of Instruction and Examinations

The medium of instruction and examinations shall be English.

1.4. Requirements for Attendance

- A candidate will be permitted to take the examination for any semester, if he/she secures not less than 75% of attendance out of the 90 working days during the semester.
- A candidate who has secured attendance less than 75% but 65% and above shall apply with the prescribed fee for the condonation of lack of attendance. On the recommendation of the Principal, he/she will be permitted to take up the examination.

- A candidate who has secured attendance less than 65% but 55% and above in any semester, will be permitted to continue the course but will not be permitted to appear for the examination in the current papers. However he/she will be permitted to appear for the examination in the papers in which he/she has arrears. He/she will have to compensate the shortage of attendance in the subsequent semester and take the examination in the papers of both the semester together.

A candidate who has secured less than 55% of attendance in any semester will not be permitted to take the regular examinations and to continue the study in the subsequent semester. He/she has to re-do the course by rejoining in the semester in which the attendance is less than 55%.

A candidate who has secured less than 65% of attendance in the final semester has to compensate his / her attendance shortage in a manner to be decided by the Head of the Department concerned after rejoining the course.

1.5 Restriction to take the Examinations

- Any candidate having arrear paper(s) shall have the option to take the examinations in any arrear paper(s) along with the subsequent regular semester papers.
- Candidates who fail in any of the papers shall pass the paper(s) concerned within five years from the date of admission to the said course. If they fail to do so, they shall take the examination in the revised text / syllabus, if any, prescribed for the immediate next batch of candidates. If there is no change in the text / syllabus they shall take the examination in that paper with the syllabus in vogue, until there is a change in the text or syllabus.

In the event of removal of that paper consequent to the change of regulations and / or curriculum after a five year period, the candidates shall have to take up an equivalent paper in the revised syllabus as suggested by the chairman and fulfill the requirements as per regulations/curriculum for the award of the degree.

1.6 The Evaluation System

The major objective of the institution's evaluation system is to motivate all students to excel in their performance. The students' performance is continually assessed through Continuous Internal Assessment (CIA) and End Assessment Examinations

(EAE). The CIA, EAE break up for theory papers is 25:75 and practical is 40:60.

1.6.1. Break Up of Continuous Internal Assessment (CIA) Marks

Theory (Core and Elective)

Content	Marks Awarded
Best out of Continuous Internal Assessment Test –I / Continuous Internal Assessment Test -II	5
Model Examination	10
Assignment (2 Numbers)	5
Seminar	5
Total	**25**

Practical

Content	Marks Awarded (Max Marks:100)
Minimum ten Experiments / Practical Paper / Semester	20
Continuous Internal Assessment Test	5
Model Exam	10
Record Note Book	5
Total	**40**

Project

Content	Marks Awarded
Review and content Presentation (3 Reviews)	120
Project Report	40
Total	160

1.6.2. End Assessment Examinations (EAE)

a) Semester examination will be conducted at the end of each semester after completing a minimum of 90 working days.

b) End Assessment Examination for the odd semester will generally be held during November and even semester during April.

c) The question papers for Part III courses will be set by the external examiners and Career Development Courses may be set by the internal or external examiners.

d) The exams for Core and Elective will be conducted for a maximum of 75 marks for three hours. The passing minimum for CIA and EAE is 50% (38 out of 75 Marks) and overall passing minimum putting the CIA and EAE marks together will be 50 % (50 out of 100).

e) Question Paper Pattern: (Core and Elective)

Part A	10*1 = 10Marks	10 Questions – 1 Marks each – MCQ
Part B	5*5 = 25 Marks	5 Questions - 5 Marks each – either or type.
Part C	5*8 = 40Marks	5 Questions - 8 Marks each - either or type
Total	75 Marks	

f) Question paper pattern: (Extra Credit Courses)

Part A	5*8=40 Marks	5 Questions- 8 Marks each – either or type
Part B	5*12=60 Marks	5 Questions- 12 Marks each – either or type
Total	100 Marks	

g) The marks secured in the extra credit course will get reflected in the mark sheet only if the candidate has secured 50% marks and above.

h) The students will be allowed to choose only two papers per semester under the extra credit courses from third semester onwards.

l) Online Course

Students have to register online courses in NPTEL /SWAYAM /MOOC / COURSERA /EDX / Spoken Tutorial /others can appear for the exam in same web portal and submit the certificate during the sixth semester. .

m) Practical

Content	**Marks Awarded (Max Marks: 50)**
Program - 1	20
Program - 2	20
Viva voce	10
Record	10
Total	**60**

Evaluation:

Content	**Marks Awarded**
Attendance	10
Work diary	15
Report	50
Viva Voce	25
TOTAL	**100**

s) Project

The evaluation for the End semester examination should be as per the norms given below:

Content	Marks Awarded
Viva Voce	40
Total	**40**

v) There will be one independent valuation for all theory papers of UG courses by external examiner, except for self study subjects, value based subjects, Non-major Electives , Skill Based subject and Extra Credit Courses.

w) A candidate may request for re-totalling / revaluation of his/her answer script by submitting an application addressing to the Controller of Examination through the Principal, paying the prescribed fee. This provision is available for all theory papers taken in the EAE. However there is no provision for revaluation of Practical papers.

x) Candidates desirous of improving the marks awarded in a passed subject in their first attempt shall reappear once within a period of subsequent two semesters. The improved marks shall be considered for classification but not for ranking. When there is no improvement, there shall not be any change in the original marks already awarded.

y) Supplementary examination will be conducted for the benefit of final year students after 15 days of the declaration of the final semester results. Candidate who has arrears in any semester subject to a maximum of one paper can appear for the supplementary exam conducted after the final semester.

1.7 Grading

The following table gives the marks grade points, letter grades and classification to indicate the performance of the candidate.

Conversion of Marks to Grade Points and Letter Grade

Range of Marks	Grade Points	Letter Grade	Description
90-100	9.0-10.0	O	Outstanding
80-89	8.0-8.9	D+	Excellent
75-79	7.5-7.9	D	Distinction
70-74	7.0-7.4	A+	Very Good
60-69	6.0-6.9	A	Good
50-59	5.0-5.9	B	Average

00-49	0.0	U	Re – Appear
ABSENT	0.0	AB	Absent

C_i = Credits earned for course i in any semester

G_i = Grade Point obtained for course i in any semester

n = refers to the semester in which such course were credited

For a Semester:

GRADE POINT AVERAGE [GPA] = $\sum_i C_i G_i / \sum_i C_i$

$$GPA = \frac{\text{Sum of the multiplication of grade points by the credits of the courses}}{\text{Sum of the credits of the courses in a semester}}$$

For the Entire Programme:

CUMULATIVE GRADE POINT AVERAGE [CGPA] = $\sum_n \sum_i C_{ni} G_{ni} / \sum_n \sum_i C_{ni}$

$$CGPA = \frac{\text{Sum of the multiplication of grade points by the credits of the entire programme}}{\text{Sum of the credits of the courses of the entire programme}}$$

Classification of Successful Candidates

A candidate who passes all the examinations in Part I to Part V securing following CGPA and Grades shall be declared as follows for each part:

CGPA	Grade	Classification of Final Result
9.5 and above up to 10.0	O+	First Class – Exemplary*
9.0 and above but below 9.5	O	
8.5 and above but below 9.0	D++	First Class with Distinction*
8.0 and above but below 8.5	D+	
7.5 and above but below 8.0	D	
7.0 and above but below 7.5	A++	First Class
6.5 and above but below 7.0	A+	
6.0 and above but below 6.5	A	
5.5 and above but below 6.0	B+	Second Class
5.0 and above but below 5.5	B	
0.0 and above but below 5.0	U	Re - Appearance

*** The candidates who have passed in the first appearance and within the prescribed semester of the Programme (Major and Elective Course alone) are eligible.**

1.8 Course Completion

Students shall complete the programme within a period not exceeding two years for PG courses from the date of admission.

KOVAI KALAIMAGAL COLLEGE OF ARTS AND SCIENCE
SCHEME OF EXAMINATION AND PROGRAMME STRUCTURE
Under CBCS Pattern and Outcome Based Education
M.Sc (Computer Science)

Part	Course Code	Title of the Course	Hours per week	CIA	Exam	Total	Credits
Semester – I							
III	24P1CSCT01	**Core 1:** ASP. NET	4	25	75	100	4
III	24P1CSCT02	**Core 2:** Data Mining and Warehousing	4	25	75	100	4
III	24P1CSCT03	**Core 3:** Advanced Computer Networks	4	25	75	100	4
III	24P1CSCT04	**Core4:**Advanced Software Engineering	4	25	75	100	3
III	24P1CSCP05	**Core 5:** ASP.NET – Practical	4	40	60	100	3
III	24P1CSCP06	**Core 6:** Data Mining Using R-Tool – Practical	3	40	60	100	3
III	24P1CSCP07	**Core 7:** NS2 Practical	5	40	60	100	3
III	24P1CSCP08	**Core 8:** Software Engineering -Practical	2	20	30	50	2
		Library Work	6	-	-	-	-
		Total	**36**			**750**	**26**
Semester – II							
III	24P2CSCT09	**Core 9:** Distributed Computing and Linux	5	25	75	100	4
III	24P2CSCT10	**Core 10:** Cloud Computing	5	25	75	100	4
III	24P2CSCT11	**Core 11:** Advanced Java Programming	5	25	75	100	4
III	24P2CSCP12	**Core 12:** Linux using Shell Scripting – Practical	5	40	60	100	4
III	24P2CSCP13	**Core 13:** Advanced Java Programming – Practical	4	40	60	100	3
III	24P2CSCP14	**Core 14:** Cloud Computing - Practical	2	20	30	50	2
III		**Elective 1**	4	25	75	100	4
		Library Work	6	-	-	-	-
		Total	**36**			**650**	**25**

Batch(2024-2026)

Semester – III							
III	24P3CSCT15	**Core 15:** Digital Image Processing	4	25	75	100	4
III	24P3CSCT16	**Core 16:** Python Programming	4	25	75	100	4
III	24P3CSCT17	**Core 17:** Big Data and Analytics	4	25	75	100	4
III	24P3CSCP18	**Core 18:** Digital Image Processing – Practical	4	40	60	100	3
III	24P3CSCP19	**Core 19:** Python Programming - Practical	4	40	60	100	3
III	24P3CSCP20	**Core 20:** Android and its Applications – Practical	4	40	60	100	3
III	24P3CSCP21	**Core 21:** MAT Lab - Practical	2	40	60	100	2
III		**Elective 2**	4	25	75	100	4
III	24P3OLCT01	Online Course (NPTEL/Swayam /Spoken Tutorial /Udemy/UDx/CourseEra,etc)	--	--	--	--	--
		Library Work	6	-	-	-	-

		Total	**36**			**800**		**27**
Semester – IV								
III	24P4CSCV22	**Core 22:** Project and Viva Voce	30	-	160	40	200	12
		Project Review	6	-	-	-	-	-
		Total	36				**200**	12
		Overall Total	**144**				**2400**	**90**

CURRICULUM STRUCTURE

S.No.	**Courses**	**No. of Papers**	**Credits**
1	Core Courses	22	82
2	Electives	2	8
3	Online Course	1	-
Total		**25**	90

Semester – II (Elective I)		
List of Elective Courses		
S.No	**Course Code**	**Name of the Course**
1.	24P2CSET1A	Grid Computing
2.	24P2CSET1B	Neural Networks and genetic algorithm
3.	24P2CSET1C	E- Technologies
4.	24P2CSET1D	Cyber Law and Security Policy
5.	24P2CSET1E	Wireless Networking Technology

Semester – III (Elective II)		
List of Elective Courses		
S.No	**Course Code**	**Name of the Course**
1.	24P3CSET2A	Software Project Management
2.	24P3CSET2B	Enterprise Resource Planning
3.	24P3CSET2C	Software Testing
4.	24P3CSET2D	Android and its Applications
5.	24P3CSET2E	Intrusion Detection System

SEMESTER – I

Programme code:	**M.Sc CS**	**Programme Title**	**Master of Computer Science**	
Course Code:	24P1CSCT01	Title : Core 1:ASP . NET	Batch:	2024-2026
			Semester:	I
Hrs/Week:	5 Hrs		Credits:	4

COURSE OBJECTIVES

- On Successful Completion of this subject the students should have knowledge on Asp.net Concepts.
- To inculcate Knowledge tin developing database applications in ASP.Net
- Got the skill of developing Web Applications
- Maintain session and controls related information for user used in multi user web applications.
- Understand the fundamentals of developing modular application by using object oriented methodologies

COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	**CO Statement**
CO1	Explain the Basics of Programming and development environment in ASP.Net
CO2	Describe about Visual basic. NET and ASP Server object technologies
CO3	Enumerate the ASP.NET Configuration and session object.
CO4	Elucidate on Active Server Components and Server Controls.
CO5	Determine the connect database in Active server web page with web services applications.

MAPPING WITH PROGRAMME OUTCOMES

Cos	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	L	H	H	H	M	H	H	H	M	M	H	H
CO2	L	H	H	H	M	H	H	H	M	M	H	H
CO3	L	H	H	H	M	H	H	H	M	M	H	H
CO4	L	H	H	H	M	H	H	H	M	M	H	H
CO5	L	H	H	H	M	H	H	H	M	M	H	H

H-High M-Medium L-Low

SYLLABUS

UNIT I **Hours:12**

Getting Setup - what is ASP.NET- Setting up for ASP.NET- The development environment – ASP & ASP.NET. An overview – ASP.NET Programming Languages. Programming Basics: Basics of Programming - Program Flow – Effective Coding Techniques – Designing Applications.

UNIT II **Hours:12**

How Dynamic Website Applications work- Processing ASP.NET with Visual basic. NET:VB.NET Programming Language Structures –Built in ASP.NET objects & Interactivity- The response object –The ASP Server object.

UNIT III **Hours:12**

Web forms & ASP.NET: Web forms- ASP.NET Configuration, Scope and State: ASP.NET and configuration- ASP.NET and state –The application object –ASP sessions – The session object.

UNIT IV **Hours:12**

ASP.NET objects and components: The Scripting Object Model- Active Server Components and Controls –More Active Server Components.

UNIT V **Hours:12**

Web services & ASP. NET –WSDL & SOAP- Web services Background – ASP.NET &SQL server- using SQL server –using databases in ASP.NET applications-ActiveX data objects- the ADO.NET objective model –coding structured query language.

REFERENCE BOOKS (Recent Edition of the following books only are recommended)

S.No	Authors	Title	Publishers
1.	Dave Mercer	ASP. NET A Beginners Guide	Tata McGraw –Hill Pub. Company Ltd, 2002
2.	AI Williams , Kim Barber	ASP Solutions	DreamTech Press 2000.
3.	Mathew MacDonald	SP.Net The Complete Reference	McGraw-Hill Publishing Company Limited New Delhi
4.	Kirk Allen Evans, Ashwin Kamanna, Joel Mueller	XML and ASP.NET	Pearson Education, 2002.

WEBSITE REFERENCE

1. https://ocw.mit.edu/courses/Computer-science/ASP.NET
2. https://www.bestcomputersciencedegrees.com

Means Of Curriculum Delivery: Lecture, Group Discussion, Seminar, Assignment, and Google Classroom**.**

SEMESTER – I

Programme code:	**M.Sc CS**	**Programme Title**	**Master of Computer Science**	
Course Code:	24P1CSCT02	Title: Core 2: Data Mining And Warehousing	Batch:	2024-2026
			Semester:	I
Hrs/Week:	5 Hrs		Credits:	4

COURSE OBJECTIVES

- Identify the scope and necessity of Data Mining & Warehousing for the society
- To enable the students to learn the Data mining Tasks and data warehousing Techniques.
- To understand the Association Rules, Clustering Techniques in Data mining.
- To know about the OLAP and OLTP Concepts in Data warehousing.
- To develop ability to design various algorithms based on data mining tools.

COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	**CO Statement**
CO1	Explain the fundamental concepts of Data Mining
CO2	Describe Classification and **N**eural Network Based Algorithms
CO3	Illustrating the Clustering and Association rule with suitable algorithm
C04	Explain the fundamental concepts of OLAP
C05	Choose case study about Data warehousing and data mining with various domain

MAPPING WITH PROGRAMME OUTCOMES

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	M	H	H	H	L	M	M	H	L	H	M	H
CO2	M	H	H	H	L	M	M	H	L	H	M	H
CO3	M	H	H	H	L	M	M	H	L	H	M	H
CO4	M	H	H	H	L	M	M	H	L	H	M	H
CO5	M	H	H	H	L	M	M	H	L	H	M	H

H-High M-Medium L-Low

SYLLABUS

UNIT I **Hours: 12**

Introduction : Basic Data Mining Tasks- Data Mining Versus Knowledge Discover in Databases-Data Mining issues-Data Mining Metrics-Social Implication of Data Mining – Data Mining from Database Perspective. **Data Mining Techniques**-Introduction - A statistical perspective on Data Mining :Point Estimation-Model Based Summarization -Bayes Theorem-Hypothesis Testing-Regression and correlation- Decision Trees-Neural networks-Genetic Algorithms.

UNIT II **Hours: 12**

Classification: Introduction- A statistical Based Algorithms-Distance Based Algorithms-**Decision Tree Algorithms:** ID3-C4.5,CART-**Neural Network Based Algorithms :**Introduction-Propagation -Perceptions Rule Base Algorithms-Combining Techniques.

UNIT III **Hours: 12**

Clustering: Introduction-Similarity and Distance Measures-Outlines-Hierarchical Algorithms- Partitioned Algorithms: Introduction-Minimum Spanning Tree-Squared Error Clustering Algorithm-K-Means Clustering **Association Rules :** Introduction-Large Item Sets-Basic Algorithms-Parallel and Distributed Algorithms-Measuring Quality of Rules.

UNIT IV **Hours: 12**

Data Warehousing: An Introduction –Characteristics of Data Warehousing-Data Marts-Other Aspects of Data marts- OLAP. Developing Data Warehousing-Applications of Data Warehousing and Data Mining in Government.

UNIT V **Hours: 12**

Case Study :DW in Government -DW in the World Bank-A typical Business DW for a Trading Company. Case study: Mining Medical Images, The Mining of SAS Technical Support Data.

REFERENCE BOOKS (Recent Edition of the following books only are recommended)

S.No.	Authors	Title	Publishers	Year of Publication
1.	David Hand,Heikki Mannila & padhraic Smyth	Principles of Data Mining	PHI	2000
2	Arun.K.Pujari	DM Techniques	universities press(India) Pvt Ltd,2003	2003
3	Alex berson,Stephen J.Smith	Data warehousing,Data Mining and OLAP	TMCH	2001
4	Jiawei Han and Micheline kamber	Data Mining Concepts and Techniques	Academic Press	2001

WEBSITE REFERENCE

1.https://ocw.mit.edu/courses/Computer-science/DataMining
2.https://www.bestcomputersciencedegrees.com

Means Of Curriculum Delivery: Lecture, Group Discussion, Seminar,Assignment,Case studies and Google Classroom

SEMESTER – I

Programme	M.Sc CS	Programme Title	Master of Computer

code:			**Science**	
Course Code:	24P1CSCT03	Title: Core 3:Advanced Computer Networks	Batch:	2024-2026
			Semester:	I
Hrs/Week:	4Hrs		Credits:	4

COURSE OBJECTIVES

- The course is aimed at providing basic understanding of Computer networks starting with OSI Reference Model, Protocols at different layers.
- To learn about the digital networks & internet protocols.
- To have a clear idea about various functions of TCP and UDP.
- To learn about user networks interfaces and protocols of on B-ISDN and its operations and maintenance.
- The learning outcomes include understanding the principles for implementing a multi layer network, management systems for the network and routing of information throughout the network.

COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	**CO Statement**
CO1	Explain about the data communication and Networking and various transmission methods
CO2	Describe various transmission media and routing algorithms
CO3	Apply the networking protocol and OSI model in computer communication
CO4	Explain about various Digital Networks and Internet protocols and their standard
CO5	Elucidate genesis, principles and standard of ATM

MAPPING WITH PROGRAMME OUTCOMES

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	M	H	H	H	M	H	M	H	M	H	M	H
CO2	M	H	H	H	M	H	M	H	M	H	M	H
CO3	M	H	H	H	M	H	M	H	M	H	M	H
CO4	M	H	H	H	M	H	M	H	M	H	M	H
CO5	M	H	H	H	M	H	M	H	M	H	M	H

H-High M-Medium L-Low

SYLLABUS

UNIT I **Hours: 12**

Introduction to Data Communications and Networking : Introduction – Fundamentals concepts – Data Communication – Protocols – standards – Standards organization – signal propagation- analog and Digital signals. **Analog and Digital Transmission methods**: Introduction – Analog signal , Analog Transmission – Digital Signal , Digital Transmission – Digital Signal , Analog Transmission – Analog signal , Digital Transmission.

UNIT II **Hours: 12**

Transmission Media: Introduction – Guided Media – Unguided Media **. Network Typologies, switching and routing algorithms:** Introduction – Mesh , Star, Tree , Ring, Bus , Hybrid Typologies. Switching Basics – Circuit, packet , Message switching - Router and Routing – Routing Algorithms.

UNIT III **Hours: 12**

Networking Protocol and OSI Model : Introduction – Protocols in computer communication – the OSI Model – OSI Layer Functions. **TCP/IP :** TCP - UDP – DNS – Email - FTP - TFTP.

UNIT IV **Hours: 12**

ISDN : ISDN Introduction – Background of ISDN – ISDN Architecture – ISDN Interfaces – Functional Grouping – Reference Point – ISDN Protocols Architecture – Broadband ISDN (B-ISDN) – **X.25 Protocol:** Understanding how X.25 Works – Characteristics X.25 – Packet Format X.25 operation.

UNIT V **Hours: 12**

Overview of ATM : Introduction – What is ATM ? Genesis of ATM – Basic Principles of ATM – Precursor Technologies – B-ISDN and ATM – ATM Standards.

REFERENCE BOOKS **(Recent Edition of the following books only are recommended)**

S.No	Authors	Title	Publishers
1	Achyut Godbole	DATA COMMUNICATION AND NETWORKS	Tata McGraw-Hill Seventh Reprint 2007
2.	Sumit Kasera & Pankaj Sethi	ATM Networks concepts and protocols	TMH, 2003.
3.	Uyless Black	COMPUTER NETWORKS - Protocols, Standards, and Interfaces	Prentice-Hall International, 1993..
4.	William Stallings	ISDN and Broad Band ISDN with Frame Relay and ATM	Pearson Education, 4 th Edition, 2009.

WEBSITE REFERENCE

1.https://ocw.mit.edu/courses/Computer-science/cyberlaw
2.https://www.bestcomputersciencedegrees.com

Means Of Curriculum Delivery: Lecture, Group Discussion, Seminar,Assignment, and Google Classroom

SEMESTER - I

Programme	**M.Sc CS**	**Programme Title**	**Master of Computer Science**

code:				
Course Code:	24P1CSCT04	Title: Core 4:Advanced Software Engineering	Batch:	2024-2026
			Semester:	I
Hrs/Week:	4 Hrs		Credits:	3

COURSE OBJECTIVES

- To build on their basic software engineering knowledge by extending it with specific techniques for maintenance, evolution, dependability, reliability, safety, security, and resilience.
- To provide an advanced understanding and knowledge of the *software engineering* techniques, techniques to collect software requirements
- To provide knowledge on Software engineering concepts
- To make the students understand various techniques of cost estimation of software , software design and software Requirements.
- To understand various issues in implementation of software, verification , validation and maintenance of software.

COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Classify the process models for a software project Development.
CO2	Relate the SRS, Design document, Project plan of a given software system
CO3	Estimate the cost of software using different techniques
CO4	Design and develop a software, verify and validate the same using different techniques
C05	Explain about how to validate and verify the project

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	M	H	H	H	M	H	M	H	M	M	M	H
CO2	M	H	H	H	M	H	M	H	M	M	M	H
CO3	M	H	H	H	M	H	M	H	M	M	M	H
CO4	M	H	H	H	M	H	M	H	M	M	M	H
CO5	M	H	H	H	M	H	M	H	M	M	M	H

H-High M-Medium L-Low

SYLLABUS

UNIT I **Hours: 12**

Introduction to Software Engineering: Definitions – Size Factors – Quality and

Productivity Factors. **Planning a Software Project:** Planning the Development Process – Planning an Organizational Structure.

UNIT II **Hours: 12**

Software Cost Estimation: Software cost Factors – Software Cost Estimation Techniques – Staffing-Level Estimation – Estimating Software Estimation Costs.

UNIT III **Hours: 12**

Software Requirements Definition: The Software Requirements specification – Formal Specification Techniques. **Software Design:** Fundamental Design Concepts – Modules and Modularization Criteria.

UNIT IV **Hours: 12**

Design Notations – Design Techniques. **Implementation Issues**: Structured Coding Techniques – Coding Style – Standards and Guidelines – Documentation Guidelines.

UNIT V **Hours: 12**

Verification and Validation Techniques: Quality Assurance – Walkthroughs and Inspections – Unit Testing and Debugging – System Testing. **Software Maintenance:** Enhancing Maintainability during Development – Managerial Aspects of Software Maintenance – Configuration Management.

REFERENCE BOOKS (Recent Edition of the following books only are recommended)

S.No.	Authors	Title	Publishers	Year of Publication
1.	Richard Fairley,	Software Engineering Concepts	Latest Edition. TMH.	
2	Eve Anderson, Philip Greenspun, Andrew Grumet,	Software Engineering for Internet Applications	PHI	2006
3	Jeff Tian,	Software Quality Engineering	Student edition, Wiley India	2006

WEBSITE REFERENCE

1.https://www.w3schools.com/softwareengineering
2.https://www.bestcomputersciencedegrees.com

Means Of Curriculum Delivery: Lecture, Group Discussion, Seminar,Assignment, and Google Classroom

SEMESTER - I

Programme code:	**M.Sc CS**	**Programme Title**	**Master of Computer Science**	
Course Code:	24P1CSCP05	Title: Core 5:ASP .Net Programming – Practical	Batch:	2024-2026
			Semester:	I
Hrs/Week:	5 Hrs		Credits:	3

COURSE OBJECTIVES

- To develop the applications using ASP.NET programming language.
- To apply the concepts like different controls, mathematical functions and database in real problems.

COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	**CO Statement**
CO1	Choose the looping and decision making statements to solve the problems in ASP.Net.
CO2	Develop an application using Console, GUI and web in .NET
CO3	Develop a programming in ASP.Net
CO4	Creating an application using ASP.Net for connection database.
CO5	Creating an application using ASP.Net validation

MAPPING WITH PROGRAMME OUTCOMES

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	M	H	H	H	L	H	M	H	L	M	H	H
CO2	M	H	H	H	L	H	M	H	L	M	H	H
CO3	M	H	H	H	L	H	M	H	L	M	H	H
CO4	M	H	H	H	L	H	M	H	L	M	H	H
CO5	M	H	H	H	L	H	M	H	L	M	H	H

H-High M-Medium L-Low

PROGRAM LIST

1..Program to demonstrate the textbox control in ASP.NET

2.. Program to demonstrate the button as image control in ASP.NET

3..Program to demonstrate the checkbox control in ASP.NET

4..Program to demonstrate the radio button control in ASP.NET

5. .Program to convert decimal number to binary, octal and hexadecimal.

6..Program to design simple registration form using asp .net objects.

7.. Program to design a registration form by using ASP.NET objects.

8..Program to develop Date & time using ASP.Net

9..Create an application in ASP .Net for student information database and perform the

Following operations:

i.Addition ii.Deletion

10.Program to develop a Calculator using ASP.NET

11.Program to develop a Image using ASP.NET.

12. Program to develop web page using validation controls in ASP.NET

WEBSITE REFERENCE

- https://www.w3schools.com/asp/webpages_examples.asp
- *https://www.sourcecodester.com/asp*

Programme code:	**M.Sc CS**	**Programme Title**	**Master of Computer Science**	
Course Code:	24P1CSCP06	Title: Core 6: Data Mining Using R Tool –Practical	Batch:	2024-2026
			Semester:	I
Hrs/Week:	3 Hrs		Credits:	3

COURSE OBJECTIVES

- To develop the Algorithms using R-Tool in Data Mining.
- To apply the Concepts like Prepossessing, Association Rule, Classification Rule and Clustering Rule to various domains

COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	**CO Statement**
CO1	Create and apply various data sets with the help of R-Tool to develop various algorithms involving association, classification and clustering.
CO2	Knowledge of this R-Tool used to demonstrate practical experience in Real-Time applications and to use the knowledge for getting involved research.

MAPPING WITH PROGRAMME OUTCOMES

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	L	H	H	L	L	H	L	M	L	H	L	H
CO2	L	H	H	L	L	H	L	M	L	H	L	H

H-High M-Medium L-Low

PROGRAM LIST

1. Demonstration of pre-processing on dataset student.csv
2. Demonstration of pre-processing on dataset labor.csv
3. Demonstration of Association rule process on dataset contactlenses.csv using apriori algorithm
4. Demonstration of Association rule process on dataset test.csv using apriori algorithm
5. Demonstration of classification rule process on dataset student.csv using j48 algorithm
6. Demonstration of classification rule process on dataset employee.csv using j48 algorithm
7. Demonstration of classification rule process on dataset employee.csv using id3 algorithm
8. Demonstration of classification rule process on dataset employee.csv using naïve bayes algorithm
9. Demonstration of clustering rule process on dataset iris.csv using simple k-means
10. Demonstration of clustering rule process on dataset student.csv using simple k-means .
11. Demonstration of Hierarchical Clustering process on dataset iris.csv.
12. Demonstration of Decision Trees process on dataset student.csv using simple k-means .

Pedagogy : System, White Board, Demonstration through PPT

WEBSITE REFERENCE

1.https://www.tutorialspoint.com › R › R
2.www.rdatamining.com/

SEMESTER - I

Programme code:	**M.Sc CS**	**Programme Title**	**Master of Computer Science**	
Course Code:	24P1CSCP07	Title: Core 7:NS2 - Practical	Batch:	2024-2026
			Semester:	I
Hrs/Week:	6 Hrs		Credits:	3

COURSE OBJECTIVES

- To Find Number of Packets using NS2
- To determine CRC(Cyclic Redundancy Check) Concepts.

COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	**CO Statement**
CO1	Understand the simulation using NCTU/NS
CO2	Simulate a three nodes point – to – point network with duplex links between them.
CO3	Understand the error detecting using cyclic redundancy check (CRC).

MAPPING WITH PROGRAMME OUTCOMES

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	H	H	H	M	H	M	H	H	H	H	M	M
CO2	H	H	H	M	H	M	H	H	H	H	M	M
CO3	H	H	H	M	H	M	H	H	H	H	M	M

H-High M-Medium L-Low

PROGRAM LIST

1. Simulate to Find the Number of Packets Dropped

2.Simulate to Find the Number of Packets Dropped by TCP/UDP

3. Simulate to Find the Number of Packets Dropped due to Congestion

4.Simulate to Compare Data Rate& Throughput.

5.Simulate to Plot Congestion for Different Source/Destination

6.Simulate to Determine the Performance with respect to Transmission of Packets

.

7.CRC(Cyclic Redundancy Check)

8.Distance Vector Routing

Pedagogy

- System, White Board, Demonstration through PPT

WEBSITE REFERENCE

1) https://www.w3schools.com/NS2/Praticals
2) https://www.sourcecodester.com/NS2

SEMESTER-I

Programme	**M.Sc.CS**	**Programme Title**	**Master of Science**

Code			**(Computer Science)**	
Course Code	24P1CSCP08	**Core 8:** Software Engineering - Practical	**Batch**	2024-2026
			Semester	**I**
Hrs/ Week	**2 Hours**		**Credits**	**2**

COURSE OBJECTIVES

To develop the software Engineering models..

COURSE OUTCOMES

On successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Ability to translate end-user requirements into system and software requirements
CO2	Ability to generate a high-level design of the system from the software requirements
CO3	Will have experience and/or awareness of testing problems and will be able to develop a simple testing report

MAPPING WITH PROGRAMME OUTCOMES

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	H	H	L	H	M	H	H	H	H	L	L	H
CO2	H	H	L	H	M	H	H	H	H	L	L	H
CO3	H	H	L	H	M	H	H	H	H	L	L	H

H-High M-Medium L-Low

List of Experiments:

1. To develop requirement specification for given problem.
2. To develop DFD model.
3. To develop use case model for a problem.
4. To develop Class diagram for a problem.
5. To develop for sequence diagram for given problem.

Reference:

www.google.com

SEMESTER – II

Programme code:	**M.Sc CS**	**Programme Title**	**Master of Computer Science**
Course Code:	**24P2CSCT09**	**Core 9:Distributed Computing And Linux**	**Batch:** 2024-2026
			Semester: II
Hrs/Week:	**5 Hrs**		**Credits :4**

COURSE OBJECTIVES

- To Understand foundations of Distributed Systems.
- To provide knowledge in the concepts of operating system and shell programming
- To make the students understand the various techniques in operating systems
- To provide knowledge in Linux concepts
- To understand various issues in Synchronization techniques

COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Explain the fundamental concepts of Computer Networks and ATM Technology.
CO2	Elucidate on Encoding and Decoding and RPC Models.
CO3	Solve the real world problems by using Deadlock concepts
CO4	Categorize the Open source software's
CO5	Assess the Linux File Structure and TCP/IP networks

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	L	H	H	L	M	H	M	H	L	L	L	H
CO2	L	H	H	L	M	H	M	H	L	L	L	H
CO3	L	H	H	L	M	H	M	H	L	L	L	H
CO4	L	H	H	L	M	H	M	H	L	L	L	H
CO5	L	H	H	L	M	H	M	H	L	L	L	H

H-High M-Medium L-Low

Syllabus

UNIT I

Hours:15

Fundamentals: Evolution- Models- Distributed OS – Issues – Distributed Computing Environment(DCE). Computer Networks: Types – LAN – WAN – Communication Protocols - Internetworking – ATM Technology.

UNIT II

Hours:15

Message Passing : Synchronization – Buffering – Multigame Messages – Encoding and Decoding – Process Addressing – Failure Handling - Group Communication. Remote procedure Calls: The RPC Models – Transparency – Implementation – Stub generation -RPC messages - Marshalling Arguments and Results – Server management- Parameter passing Semantics – Cell Semantics- Communication Protocols.

UNIT III

Hours:15

Synchronization – Clock Synchronization – event ordering - 0 mutual exclusion – deadlock – election algorithms. Resource Management: Global Scheduling Algorithm – Task Assignment Approach – Load balancing Approach – Load sharing approach . Process management : Process migration – Threads.

UNIT IV

Hours:15

Introduction to Linux: Operating system and linux – History – Open source software – linux software. The shell: command line – filename expansions – Standard input / output and redirection-pipes-shell variables – shell scripts -jobs. Shell Configuration : Command and file name completion – command line editing – history – Aliases – controlling shell operations – variables and subshells – configuring shell and shell variables.

UNIT V

Hours:15

Linux File Structure: Files and directories – Permissions – m tools utilities -achieve files and compressions. TCP/IP networks: Network address : Class based IP Addressing – net mask – CIDR – obtaining IP address – broad addresses – gate way addresses – name server addresses. TCP / IP configuration files: identifying host names – network names-domain name service

REFERENCE BOOKS (Recent Edition of the following books only are recommended)

S.No	Authors	Title	Publishers
1	Pradeep K.Sinha	Distributed Operating Systems – Concepts and Design	Prentice hall of India.
2.	Richard peterson	Linux -The Complete reference	Tata McGraw Hill Publications, Fifth edition.
3.	Andrew S.Tanenbaum and Marten Van Steen	Distributed Systems – Principles and Paradigms	PHI, 2004..
4.	Pradeep K.Sinha,	Distributed Operating Systems	PHI, 2001.
5.	George coulouris, Jean Dollimore and Tim Kindberg,	Concepts and Design	3rd Edition, Pearson Education,2002.

WEBSITE REFERENCE

1.https://www.w3schools.com/Distributed Computing
2.https://www.bestcomputersciencedegrees.com

Means Of Curriculum Delivery: Lecture, Group Discussion, Seminar,Assignment,and Google Classroom

SEMESTER - II

Programme	M.Sc CS	Programme Title	Master of Computer

code:			**Science**
Course Code:	**24P2CSCT10**	**Core 10:Cloud Computing**	**Batch:** 2024-2026
			Semester: II
Hrs/Week:	**5 Hrs**		**Credits: 4**

Course Objectives

- To understand the Systems with the comprehensive and in-depth knowledge of Cloud Computing concepts, technologies, architecture and applications.
- To learn the basics of cloud computing .
- Understand the architecture and concept of different cloud models: IaaS, PaaS, SaaS.
- To Understand the Cloud computing architectures, applications and challenges.
- To learn about various cloud storages.

COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT
CO1	Explain the basics of cloud computing
CO2	Provide details about the Cloud computing architectures, applications and challenges
CO3	Discuss about the various cloud storages, Schedules and Task Management and explain how to collaborate on various functions using cloud
CO4	Create groups on social network and evaluate online groupware
CO5	demonstrate storing and sharing the files, photo using cloud

MAPPING WITH PROGRAMME OUTCOMES

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	L	H	H	L	L	H	L	H	L	L	L	H
CO2	L	H	H	L	L	H	L	H	L	L	L	H
CO3	L	H	H	L	L	H	L	H	L	L	L	H
CO4	L	H	H	L	L	H	L	H	L	L	L	H
CO5	L	H	H	L	L	H	L	H	L	L	L	H

H-High M-Medium L-Low

SYLLABUS

UNIT I **Hours:15**

INTRODUCTION: Cloud Computing Introduction, From, Collaboration to cloud, Working of cloud computing, pros and cons, benefits, developing cloud computing services, Cloud service development, discovering cloud services.

UNIT II **Hours:15**

CLOUD COMPUTING FOR EVERYONE: Centralizing email communications, cloud computing for community, collaborating on schedules, collaborating on group projects and events, cloud computing for corporation, mapping schedules managing projects, presenting on road.

UNIT – III **Hours:15**

USING CLOUD SERVICES : Collaborating on calendars, Schedules and task management, exploring on line scheduling and planning, collaborating on event management, collaborating on contact management, collaborating on project management, collaborating on word processing,

spreadsheets, and databases.

UNIT – IV **Hours:16**

OUTSIDE THE CLOUD : Evaluating web mail services, Evaluating instant messaging, Evaluating web conference tools, creating groups on social networks, Evaluating on line groupware, collaborating via blogs and wikis.

UNIT – V **Hours:14**

STORING AND SHARING: Understanding cloud storage, evaluating on line file storage, exploring on line book marking services, exploring on line photo editing applications, exploring photo sharing communities, controlling it with web based desktops.

REFERENCE BOOKS (Recent Edition of the following books only are recommended)

S.No	Authors	Title	Publishers
1.	Michael Miller	Cloud Computing	Pearson Education, New Delhi, 2009
2.	Anthony T. Velte	Cloud Computing	Tata Mcgraw Hill Education Private Limited (2009)
3.	Arshdeep Bahga	Cloud Computing	AHands-OnApproach Paperback – Import, 9 Dec 2013

WEBSITE REFERENCE

1.https://ocw.mit.edu/courses/Computer-science/cloud computing
2.https://www.w3schools.com

Means Of Curriculum Delivery: Lecture, Group Discussion, Seminar,Assignment, and Google Classroom

SEMESTER – II

Programme	M.Sc CS	Programme Title	Master of Computer

code:			**Science**
Course Code:	24P2CSCT11	Core 11:Advanced Java Programming	Batch: 2024-2026
			Semester: II
Hrs/Week:	5 Hrs		Credits: 4

COURSE OBJECTIVES

- To learn the basics of Object oriented Programming .
- To Understand the Concept of Inheritance, Exception Handling.
- To learn about JDBC Connectivity and Servlets.
- To develop Java client/server applications.
- To Identify advance concepts of java programming with database connectivity.

COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Explain the fundamental concepts of java language and control structure
CO2	Elucidate on inheritance, interface and types of Exception
CO3	Classify the java packages
CO4	Demonstrate how to connect a Network using JDBC
CO5	Discuss about Remote method Innovation

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	L	H	H	M	L	H	M	H	L	L	M	H
CO2	L	H	H	M	L	H	M	H	L	L	M	H
CO3	L	H	H	M	L	H	M	H	L	L	M	H
CO4	L	H	H	M	L	H	M	H	L	L	M	H
CO5	L	H	H	M	L	H	M	H	L	L	M	H

H-High M-Medium L-Low

SYLLABUS

Unit I **Hours:12**

Introduction to Object oriented Programming – The JAVA Language – Variable Declarations and Arrays – Operators in java – Control Statements. Introduction to Classes – Classes and method in detail : Method Overloading – Constructor Overloading.

Unit II **Hours:12**

Inheritance : Basics of Inheritance – Super class Variable – Sub class object – the super reference –Interface : defining interface – Implementing interface - Extending interface Interfaces reference .Exceptions Handling: Fundamentals of Exceptions Handling – Hierarchy of the Exceptions Classes – Types of Exceptions -

Unit III **Hours:12**

Multithread Programming : The concept of threads – runnable interface threaded creation & class - Threads life cycle - Package - String Handling – Applets.

Unit IV **Hours:12**

Networking - AWT - Layout Managers & Event Handling - Swing

Unit V **Hours:12**

JDBC - RMI - Java Servlets

TEXT BOOKS (Recent Edition of the following books only are recommended)

S.No.	Authors	Title	Publishers	Year of Publication
1.	ISRO Group	Introduction to Object Oriented Programming Through JAVA	TMH , New Delhi	2007
2	Patrick Naughton	The Java Handbook	TMH	2006

WEBSITE REFERENCE

1.https://ocw.mit.edu/courses/Computer-science/Java
2.https://www.bestcomputersciencedegrees.com

Means Of Curriculum Delivery: Lecture, Group Discussion, Seminar,Assignment, and Google Classroom

SEMESTER – II

Programme code:	**M.Sc CS**	**Programme Title**	**Master of Computer Science**

Course Code:	24P2CSCP12	Core 12:Linux Using Shell Scripting-Practical	Batch: 2024-2026
			Semester: II
Hrs/Week:	5 Hrs		Credits: 4

Course Objectives

- To develop the Linux using the Shell Script.
- To apply the Concepts like basic shell script programs
- To implement the system calls, fork and exec commands

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Interpret various test command with the help of Shell script involving status of file, menu driven, case conversion, command line arguments etc.,
CO2	Writing various programs using shell script.

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	L	H	H	M	L	H	H	M	M	M	M	H
CO2	L	H	H	M	L	H	H	M	M	M	M	H

H-High M-Medium L-Low

PROGRAMS LIST

1. To check the status of file using test command.
2. To find the grade of student's marks.
3. Menu driven shell program to perform the following.
4. Enter the sentence in file.
5. Search a whole worded in an existing file.
6. Iii) Quit.
7. To perform case conversion.
8. To find the sum of digits.
9. To find the biggest of three numbers using command line arguments.
10. Check for sufficient number of command line arguments
11. To copy, delete and renaming a file.
12. To Check Server Utilization.
13. To encrypt the File / directory.
14. 11 To create colourful texts.
15. Implementation of system calls – Open, read and close. Create, write, lseek, stat, fstat.
16. Implementation of fork & exec.

Pedagogy :System, White Board, Demonstration through PPT

WEBSITE REFERENCE

1.https://www.shellscript.sh
2.https://www.tutorialspoint.com/Linux

SEMESTER – II

Programme code:	**M.Sc CS**	**Programme Title**	**Master of Computer Science**
Course	**24P2CSCP13**	**Core 13:Advanced Java**	**Batch:** 2024-2026

Code:		**Programming -Practical**	**Semester: II**
Hrs/Week:	**4 Hrs**		**Credits:3**

Course Objectives

- To Develop applications using Java Language.
- To apply the Concepts like Looping, Classes, Inheritance, Applets and RMI
-

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Create a Java program using inheritance and Exception handling mechanism
CO2	Demonstrate using Java Applets and how to connect a JDBC in Java

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	L	H	H	H	L	H	H	H	L	H	H	H
CO2	L	H	H	H	L	H	H	H	L	H	H	H

H-High M-Medium L-Low

PROGRAMS LIST

Create an employee package to maintain the information about the employee Using constructors

1. Program to implement inheritance.
2. Java program to handle different mouse events.
3. Create an applet for a calculator application.
4. Implementation of I/O streams.
5. Implementation of Multi-threading and Exceptions Handling Concepts.
6. Create a login form using Swing Components.
7. Java program to maintain the student information in text file.
8. Animate images at different intervals by using multi-threading concepts.
9. Program to send a text message to another system and receive the text message from the system (use socket programming).
10. Java program by using JDBC concepts to access a database.
11. Java program to implement RMI.

Pedagogy

System, White Board, Demonstration through PPT

WEBSITE REFERENCE

1.https://www.w3resource.com/java-exercises/

2.https://code-exercises.com/java

SEMESTER-II

Programme Code	**M.Sc.CS**	**Programme Title**	**Master of Science (computer science)**

Course Code	24P2 CSCP14	Core 14: Cloud Computing practical	Batch	2024-2026
			Semester	II
Hrs/ Week	2		Credits	2

COURSE OBJECTIVES

The student should be made to: Be familiar with developing web services /Application in grid framework.

- Be exposed to tool kits for grid and cloud environment.
- Learn to run virtual machines of different configuration•

COURSE OUTCOMES (CO)

In Successful Completion of the course the students should be able to

CO Number	CO Statement
CO1	Design and Implement applications on the Cloud
CO2	Design and Implement applications on the complier
CO3	Design and Implement applications on the cloud sim

MAPPING WITH PROGRAMME OUTCOMES

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	H	L	H	H	H	H	H	H	M	M	M	H
CO2	H	L	H	H	H	H	H	H	M	M	M	H
CO3	H	L	H	H	H	H	H	H	M	M	M	H

H-High M-Medium L-Low

SYLLABUS

1.Install Virtualbox/VMware Workstation with different flavours of linux or windows OS on top of windows7 or 8.

2. Install a C compiler in the virtual machine created using virtual box and execute Simple Programs. 3. Install Google App Engine. Create hello world app and other simple web applications using python/java.

4. Use GAE launcher to launch the web applications.

5. Simulate a cloud scenario using CloudSim and run a scheduling algorithm that is not present in CloudSim.

WEBSITE REFERENCE 1.https://www.w3resource.com/java-exercises/

SEMESTER – III

SEMESTER – III

Programme code:	M.Sc CS	**Programme Title**	Master of Computer Science

Course Code:	24P3CSCT15	**Core 15**:Digital Image Processing	**Batch**	2024-2026
			Semester	III
Hrs/Week:	4 Hrs		**Credits**	4

COURSE OBJECTIVES

- To study the image fundamentals and mathematical transforms necessary for image processing.
- To study the image enhancement techniques.
- To study image restoration procedures.
- To study the image compression procedures.
- To analyze images in the frequency domain using various transforms

COURSE OUTCOMES

On the successful completion of the course, students will be able to achieve the following Outcomes

CO Number	CO Statement
CO1	Review the fundamental concepts of a digital image processing system
CO2	Analyze images in the frequency domain using various transforms.
CO3	Show the input – output organization, memory and their functions Evaluate the techniques for image enhancement and image restoration
CO4	Categorize various compression techniques.
CO5	Interpret Image compression standards.

APPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	M	H	H	H	M	H	M	H	M	H	M	H
CO2	M	H	H	H	M	H	M	H	M	H	M	H
CO3	M	H	H	H	M	H	M	H	M	H	M	H
CO4	M	H	H	H	M	H	M	H	M	H	M	H
CO5	M	H	H	H	M	H	M	H	M	H	M	H

SYLLABUS

UNIT I **Hours:12**

Fundamental Of Digital Image Processing : Steps in Image Processing – Building blocks of a digital image processing system – Digital Image Representation : Introduction - Digital image representation - Sampling and Quantization – Basic Relationship between pixels - Neignbors and Connectivity – Distance Measure.

UNIT II **Hours:12**

Image Transformation : Introduction – Fourier Transformation – Discrete Fourier transformation – Properties – Fast Fourier Transformation – Discrete Cosine Transformation – The Haar Transformation

UNIT III **Hours:12**

Image Enhancement : Introduction – Sample Domain and Frequency Domain Approaches

– Techniques – Spatial Domain Techniques – Spatial Filtering – Frequency Domain – Gray Level to Color Transformation

UNIT IV **Hours:12**

Image Compression : Introduction – Coding Redundancy – Inter Pixel Redundancy - Psycho Visual Redundancy – Image Compression models – The Source Encoder and Decoder – Lossy Compression Techniques – Threshold Coding – Vector Quantization – Image Compression Standard(JPEG)-Image Restoration .

UNIT V **Hours:12**

Image Segmentation : Introduction – Detection of Isolated Points – Line Detection – Edge Detection – Edge Linking and Boundary Detection – Region Oriented Segmentation – Segmentation using Thresolding – Accumulative Difference Image

TEXT BOOKS: (Recent Edition of the following books only are recommended)

S.No	Authors	Title	Publishers
1.	S.Annadurai & R. Shanmugalakshmi	Fundamentals of Digital Image Processing	Dorling Kindersley (India) PVT., Ltd
2	Rafael c. Gonzalea, Richard E. Woods	Digital Image Processing	PHI

REFERENCE BOOKS

S.No	Authors	Title	Publishers
1.	B.Chabds, D.Dutta Majumder	Digital image Processing and Analysis	PHI,2003
2.	Nick Efford	Digital image Processing introduction using Java	Person Education, 2004

WEBSITE REFERENCE

1. https://www.tutorialspoint.com/dip/

Means Of Curriculum Delivery: Lecture, Group Discussion, Seminar,Assignment,Case studies and Google Classroom

SEMESTER – III

Programme code:	M.Sc CS	**Programme Title**	Master of Computer Science	
Course	24P3CSCT16	**Core 16:** Python Programming	**Batch**	2024-2026

Code:			**Semester**	III
Hrs/Week:	4 Hrs		**Credits**	4

COURSE OBJECTIVES

- Develop a basic understanding of programming and the Python programming language.
- Understanding of scripting and the contributions of scripting languages.
- To learn how to use lists, tuples, and dictionaries in Python programs.
- To provide Built-in objectives of python knowledge.
- To understand why Python is a useful scripting language for developers

COURSE OUTCOMES

On the successful completion of the course, students will be able to achieve the following Outcomes

CO Number	CO Statement
CO1	Understanding of modern version control tools.
CO2	Exhibit facility with a Linux command line environment.
CO3	Understanding of the role of testing in scientific computing, and write unit tests in Python.
CO4	Command line tools to write and edit code.
CO5	Write code in Python to perform mathematical calculations and scientific simulations.

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	M	H	H	H	M	H	M	H	M	H	M	H
CO2	M	H	H	H	M	H	M	H	M	H	M	H
CO3	M	H	H	H	M	H	M	H	M	H	M	H
CO4	M	H	H	H	M	H	M	H	M	H	M	H
CO5	M	H	H	H	M	H	M	H	M	H	M	H

SYLLABUS

UNIT I **Hours:12**

Welcome to PYTHON: What is PYTHON-Origins-Features-Downloading and Installing PYTHON-Running PYTHON - PYTHON Documentation - comparing PYTHON-Other Implementation.GETTING STARTED:Comments-Operators-Variables and Assignments-Numbers-Strings-Lists and Tuples-Dictionaries-Code Blocks use Indentation-if statement-While Loop-For Loop and range() Built in Function-List Comprehensions-Files and the open () and File() Built in Function-Errors and Exception -Functions-Classes-Modules-Useful Functions. PYTHON Basics:Statements and Syntax-Variable Assignments-Identifiers-Basics style Guidelines-Memory Management -First PYTHON Programs-Related Modules/Developer Tools.

UNIT II **Hours:12**

Numbers:Introduction to Numbers-Integers-Double Precision Floating point Numbers-Complex Numbers-Operators- Built in and Factory Function-Others Numeric Types-Related Modules.

Unit - III **(Hours:10)**

Tuples :Tuples are immutable-Comparing tuples-Tuple assignment-Dictionaries and tuples- Multiple assignment with dictionaries-Sequences-Regular expressions- Character matching-Extracting-Combining searching and extracting, Escape character. Classes and objects: User-defined compound types-Classes and functions-My Time-Pure functions-Modifiers-Operator overloading, Polymorphism.

Unit - IV **(Hours:10)**

Stacks, Abstract data types, The Stack ADT, Implementing stacks with Python lists, Pushing and popping, Using a stack to evaluate postfix, Parsing, Evaluating postfix, Clients and providers, Queues, The Queue ADT, Linked Queue, Performance characteristics, Improved Linked Queue, Priority queue.

UNIT V **Hours:12**

Errors and Exceptions: What are exceptions?-Exceptions in python-Detecting and Handling Exceptions-Context Management- Exceptions as strings-Raising Exceptions-Assertions-Standard Exceptions- Creating Exceptions-Why Exceptions(Now)?-Why Exceptions atAll?-Exceptions and the says Module-Related Modules. Functions and Functional Programming: What are Functions?-Calling Functions-Passing Functions-Formal Arguments-Variable-Length Arguments-Functional Programming-Varible scope-*Recursion-Generators.

TEXT BOOKS: (Recent Edition of the following books only are recommended)

S.No	Authors	Title	Publishers
1.	Wesley J.Chun	Core Python Programming	PHI
2	David Beazley,Brain K.Jones	Python Cookbook	Person Education

REFERENCE BOOKS

S.No	Authors	Title	Publishers
1.	KennethA.Lambert	Fundamentals of Python:First programs	PHI,2003
2.	Kenneth Lambert	Fundamentals of Python:Data Structures	Nelson Education,2014

WEBSITE REFERENCE

1. https://www.tutorialspoint.com/python/

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SEMESTER - III

Programme code:	M.Sc CS	**Programme Title**	Master of Computer Science
Course Code:	24P3CSCT17	**Core 17:**BIG DATA AND	**Batch:** 2024-2026
			Semester: I

Hrs/Week:	4 Hrs	ANALYTICS	**Credits:** 4

COURSE OBJECTIVES

- To explore the fundamental concepts of big data analytics
- To develop in-depth knowledge and understanding of the big data analytic domain.
- To learn to analyze the big data using intelligent techniques.
- To understand the various search methods and visualization techniques.
- To learn to use various techniques for mining data stream.
- To understand the applications using Map Reduce Concepts

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COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	**CO Statement**
CO1	Classify the characteristics of Big data and analytics tools.
CO2	Relate the data analysis models of a given data sets
CO3	Learn to use various techniques for mining data stream.
CO4	understand the applications using Map Reduce Concepts
CO5	Ability to understand the Frameworks And Visualization

MAPPING WITH PROGRAMME OUTCOMES

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	M	H	H	H	M	H	M	H	M	H	M	H
CO2	M	H	H	H	M	H	M	H	M	H	M	H
CO3	M	H	H	H	M	H	M	H	M	H	M	H
CO4	M	H	H	H	M	H	M	H	M	H	M	H
CO5	M	H	H	H	M	H	M	H	M	H	M	H

Unit-I **Hours:12**

Introduction To Big Data: Introduction to BigData Platform – Traits of Big data - Challenges of Conventional Systems -Web Data – Evolution Of Analytic Scalability - Analytic Processes and Tools - Analysis vs Reporting - Modern Data Analytic Tools.

Unit-II **Hours:12**

Data Analysis: Regression Modeling - Multivariate Analysis - Bayesian Modeling - Inference and Bayesian Networks - Support Vector and Kernel Methods - Analysis of Time Series: Linear Systems Analysis - Nonlinear Dynamics - Rule Induction - Neural Networks: Principal Component Analysis and Neural Networks -Fuzzy Logic: Extracting Fuzzy Models from Data - Fuzzy Decision Trees - Stochastic Search Methods.

Unit -III **Hours:12**

Mining Data Streams: Introduction To Streams Concepts – Stream Data Model and Architecture - Stream Computing -Sampling Data in a Stream – Filtering Streams – Counting Distinct Elements in a Stream –Estimating Moments – Counting Oneness in a Window – Decaying Window - Real time Analytics Platform(RTAP) Applications - Case Studies - Real Time Sentiment Analysis, Stock Market Predictions.

Unit -IV **Hours:12**

Frequent Itemsets And Clustering : Mining Frequent Itemsets - Market Based Model – Apriori Algorithm – Handling Large Data Sets in Main Memory – Limited Pass Algorithm – Counting Frequent Itemsets in a Stream –Clustering Techniques – Hierarchical – K-Means – Clustering High Dimensional Data –CLIQUE And PROCLUS – Frequent Pattern based Clustering Methods – Clustering in Non-Euclidean Space – Clustering for Streams and Parallelism.

Unit -V **Hours:12**

Frameworks And Visualization :Map Reduce – Hadoop, Hive, MapR – Shading – NoSQL Databases - S3 - Hadoop Distributed File Systems – Visualizations - Visual Data Analysis Techniques - Interaction Techniques; Systems and Analytics Applications - Analytics using Statistical packages-Approaches to modelling in Analytics – correlation, regression, decision trees, classification, association-Intelligence from unstructured information-Text analytics-Understanding of emerging trends and technologies-Industry challenges and application of Analytics.

REFERENCE BOOKS (Recent Edition of the following books only are recommended)

S.No.	Authors	Title	Publishers	Year of Publication
1.	Michael Berthold, David J. Hand	Intelligent Data Analysis	Springer	2007.
2	AnandRajaraman and Jeffrey David Ullman	Mining of Massive Datasets	Cambridge University Press	2012
3	Bill Franks	Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics	John Wiley & sons	2012.

WEBSITE REFERENCE

1.https://intellipaat.com/tutorial/big-data-and-hadoop-tutorial

2.https://searchbusinessanalytics.techtarget.com/definition/big-data-analytics

SEMESTER – III

Programme code:	M.Sc CS	**Programme Title**	Master of Computer Science	
Course Code:	24P3CSCP18	**Core 18**: Digital Image Processing - Practical	**Batch**	2024-2026
			Semester	III

Hrs/Week:	4 Hrs		**Credits**	3

COURSE OBJECTIVES

- The fundamentals of digital image processing
- Image transform used in digital image processing
- Image enhancement techniques used in digital image processing
- Image restoration techniques and methods used in digital image processing
- Image compression and Segmentation used in digital image processing

COURSE OUTCOMES

On the successful completion of the course, students will be able to achieve the following Outcomes

CO Number	**CO Statement**
CO1	Learning basic digital image representation principals
CO2	Ability to perform spatial and frequency domain analysis
CO3	Learning methods involving binary, gray scale and color image representations
CO4	Gaining hands on experience in the use of Matlab
CO5	Learning types of image compression.

MAPPING WITH PROGRAMME OUTCOMES

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	M	H	H	H	M	H	M	H	M	H	M	H
CO2	M	H	H	H	M	H	M	H	M	H	M	H
CO3	M	H	H	H	M	H	M	H	M	H	M	H
CO4	M	H	H	H	M	H	M	H	M	H	M	H
CO5	M	H	H	H	M	H	M	H	M	H	M	H

SYLLABUS

- Write a program to convert Gray Scale image to Binary Image.
- Write a program in MAT Lab for finding Negative of an Image.
- Write a program for colour image processing
- Write a program to Implement Image enhancement Technique.
- Write a program in MAT Lab for Histogram Equalization.
- Write a program to implement Image Restoration
- Write a program to implement Gaussian High pass Filter.
- Write a program to detect Edge detection using Operators (Roberts, Prewitts and Sobels operators)
- Write a program to implement Erosion & Dilation of an Image.
- Write a program to implement image compression.
- Write a program to implement Boundary Extraction using morphology.
- .Write a program to implement Image Segmentation.

WEBSITE REFERENCE

1. https://www.tutorialspoint.com/dip/

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SEMESTER – III

Programme code:	M.Sc CS	**Programme Title**	Master of Computer Science	
Course Code:	244P3CSCP19	**Core 19:** Python Programming – Practical	**Batch**	2024-2026
			Semester	III

Hrs/Week:	4Hrs		**Credits**	3

COURSE OBJECTIVES

- To acquire basic knowledge of python programming.
- Understand decision making and functions in python.
- Learn object oriented programming using python.
- Write and debug iles handling in python.

COURSE OUTCOMES

On the successful completion of the course, students will be able to achieve the following Outcomes

CO Number	**CO Statement**
CO1	Review the concepts of python functions.
CO2	Develop python program using decision making statement
CO3	Interpret object oriented programming in python.
CO4	Design and develop GUI applications
CO5	Find the error using Exception Handling.

MAPPING WITH PROGRAMME OUTCOMES

COs	**PO 1**	**PO2**	**PO 3**	**PO4**	**PO5**	**PO 6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	M	H	H	H	M	H	M	H	M	H	M	H
CO2	M	H	H	H	M	H	M	H	M	H	M	H
CO3	M	H	H	H	M	H	M	H	M	H	M	H
CO4	M	H	H	H	M	H	M	H	M	H	M	H
CO5	M	H	H	H	M	H	M	H	M	H	M	H

SYLLABUS

- Write a Program to Print the Fibonacci sequence
- Write a Program to Convert Decimal to Binary Using Recursion
- Develop programs to understand the control structures of python
- Develop programs to learn different types of structures (list, dictionary, tuples) in python
- Develop programs to learn concept of functions scoping, recursion and list mutability.
- Develop programs to understand working of exception handling and assertions.
- Develop programs for data structure algorithms using python searching and sorting
- Develop programs to learn regular expressions using python.
- Learn to plot different types of graphs using PyPlot.
- Implement classical ciphers using python

WEBSITE REFERENCE

1. https://www.tutorialspoint.com/python/

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SEMESTER – III

Programme code:	M.Sc CS	**Programme Title**	Master of Computer Science	
Course Code:	24P3CSCP20	**Core :20** ANDROID AND ITS APPLICATION PRACTICAL	**Batch**	2024-2026
			Semester:	III
Hrs/Week:	4 Hrs		**Credits:**	3

COURSE OBJECTIVES

- On Successful Completion of this subject the students should have knowledge on Android Concepts.
- To enable the students to write android based script for application development.
- To make the students learn and understand eclipsed based IDE programming for the android environment.

COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Use the basic concepts of android.
CO2	Develop an application using Console, GUI.
CO3	Develop menu concepts in android.
CO4	Creating an application using navigation.
CO5	Develop android application to store data in internal device.

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	M	H	H	H	M	H	M	H	M	H	M	H
CO2	M	H	H	H	M	H	M	H	M	H	M	H
CO3	M	H	H	H	M	H	M	H	M	H	M	H
CO4	M	H	H	H	M	H	M	H	M	H	M	H
CO5	M	H	H	H	M	H	M	H	M	H	M	H

PROGRAM LIST

- Create “Hello World” application. That will display “Hello World” in the Middle of the screen in the red color with white background.
- To Understand Activity, intent Create sample application with login module (check username and password).On Successful login, go to next screen and on falling login , alert user using Toast. also pass username to next screen.
- Create login application where you will have to validate Emailid(username). Till the username and password is not validated, login button should remain disabled.
- 4. Create and login application as above. On successful login , open browser with any URL.
- 5. Create an application that will pass some number to the next screen, and on the next screen that number of items should be display in the list.
- 6. Create an application to call specific entered number by user in the Edit Text.
- 7. Create an application that will display toast(message) on specific interval time. Understand menu option.
- Create an application that will change color of the screen, based on selected options from the menu.
- Develop an application for working with menus and screen navigation.
- Write an application demonstrating internal storage to store private data on the device

memory.

- Design an application representing a simple calculator.

PEDAGOGY

System, White Board, Demonstration through PPT

WEBSITE REFERENCE

1.https://www.bipinrupadiya.com/android practical
2. https://www.developer.android.com/samples
3.https://www.profajaypashankar.com/Mobile--Application-Development-Practicals-1-10.pdf..

SEMESTER – III

Programme code:	M.Sc CS	**Programme Title**	Master of Computer Science	
Course Code:	24P3CSCP21	**Core 21:** MAT Lab - Practical	**Batch**	2024-2026
			Semester:	III
Hrs/Week:	2 Hrs		**Credits:**	2

COURSE OBJECTIVES

- To enable the students
- To know how to find a solution for simultaneous equations .

- To understand the method of finding eigen values and eigen vectors for matrix
- To know how to draw a graph for equations.
- To understand clearly how to evaluate the differentiation and integration of equation.
- To understand the method of finding mean, median, mode and standard deviation.

COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Design a solution for given simultaneous equations.
CO2	Compute eigen values and eigen vectors for the given matrix
CO3	Draw a graph for given equations using fplot and explot commands.
CO4	Compute the differentiation and integration of the given equation
CO5	Compute mean, median, mode and standard deviation for the given matrix

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	M	H	H	H	M	H	M	H	M	H	M	H
CO2	M	H	H	H	M	H	M	H	M	H	M	H
CO3	M	H	H	H	M	H	M	H	M	H	M	H
CO4	M	H	H	H	M	H	M	H	M	H	M	H
CO5	M	H	H	H	M	H	M	H	M	H	M	H

PROGRAM LIST

1. Write a program to get a solution for simultaneous equations
2. Write a program to find eigen values and eigen vectors for the given matrix.
3. Write a program to draw graphs using plat and e z plot
4. Write a program to differentiate and integrate the given function.
5. Write a program to find mean, median, mode and standard deviation for the given data.

PEDAGOGY

System, White Board, Demonstration through PPT

WEBSITE REFERENCE

1.https://www.bipinrupadiya.com/android practical
2. https://www.developer.android.com/samples
3.https://www.profajaypashankar.com/Mobile--Application-Development-Practicals-1-10.pdf..

Semester IV

SEMESTER – IV
CORE 22 : PROJECT VIVA VOCE

Subject Code : 24P4CSCV22 **No of Credits :12**

GUIDELINES FOR PROJECT WORK

- The aim of the project work is to acquire practical knowledge on the implementation

- of the programming concepts studied.

- Each student should carry out individually one project work and it may be a work using the software packages that they have learned or the implementation of concepts from the papers studied or implementation of any innovative idea focusing on application oriented concepts.

- The project work should be compulsorily done in the college only under the supervision of the department staff concerned.

FINAL VIVA

- Project work carries 200 marks with 20 credits
- Internal Assessment: 160 marks (40 marks for 3 reviews and 40 marks for record) and External Assessment : 40 marks (Viva Voce)
- For awarding a pass, a candidate should have obtained 50% of the total 200 Marks.(Viva - Voce)
- The evaluation would be done jointly by both the examiners(Internal and External). Students who fail in the project work and viva-voce examination or who are absent for the project viva-voce who fail to submit the project report before the due date will have to re-submit the project work and appear for the viva-voce examination during the subsequent year.

PROJECT WORK

TITLE OF THE PROJECT
Bonafide Work Done by
STUDENT NAME
REG. NO.

Project submitted in partial fulfilment of the requirements

for the award of Master of Computer Science of
Bharathiar University,Coimbatore-46

College emblem

GUIDE HOD

Submitted for the Viva-Voce Examination held on _____

Internal Examiner External Examiner

MONTH – YEAR

CONTENTS

    (Detailed explanation about the project work)

4. TESTING AND IMPLEMENTATION

5. CONCLUSION

BIBLIOGRAPHY

APPENDICES

A. DATA FLOW DIAGRAM

B. TABLE STRUCTURE

C. SAMPLE CODING

D. SAMPLE INPUT

E. SAMPLE OUTPUT

F. REPORTS

Electives

SEMESTER – II

Programme code:	**M.Sc CS**	**Programme Title**	**Master of Computer Science**
Course Code:	24P2CSET1A	Elective 1: Grid Computing	Batch: 2024-2026
			Semester: II
Hrs/Week:	5 Hrs		Credits: 4

Course Objectives

- To get Knowledge on Grid Computing , and its environment.

- To get Knowledge on its techniques and Architecture and Implementation.
- To get Knowledge on Cluster, managing grid and its services.
- To equip the learner with knowledge and skills in implementing Cloud and Grid Computing technologies in organizations.
- To identify the technical foundations of cloud systems architectures.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Explain the basics of Grid Computing
CO2	Elaborate on Grid Computing architectures, applications and challenges
CO3	Elucidate on managing grid and its services.
CO4	Give clear idea about the Open Grid Service Architecture and open grid services infrastructure
CO5	Explain different emerging security and Grid Computing Technologies in grid

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	L	H	H	M	M	H	L	H	L	L	M	H
CO2	L	H	H	M	M	H	L	H	L	L	M	H
CO3	L	H	H	M	M	H	L	H	L	L	M	H
CO4	L	H	H	M	M	H	L	H	L	L	M	H
CO5	L	H	H	M	M	H	L	H	L	L	M	H

H-High M-Medium L-Low

Syllabus

UNIT I **Hours:12**

About Grid : Introduction – Basic Concepts – Entering into grid – Definition – Grid Projects – Grid Layered Architecture – Distributed Computing – Computational Grids – Data Grids – Dynamic Virtual Organization – Distributed Shared Memory in Grid Environment .

UNIT II **Hours:12**

Grid Computing Technologies : Service Oriented Architecture (SOA) – Introduction – Reference Architecture – Design and Development – Executive Paradigm-Web Services in Grid – Web service Technologies – Technologies for Web Services – Simple Object Access Protocol (SOAP)- SOAP Processing – Supporting MEP – SOAP Modules

UNIT III **Hours:12**

Grid Platforms: Open Grid Service Architecture (OGSA) – Introduction – Architecture – Grid Service Description – OGSA Core Services- OGSA Basic Services – Open Grid Services Infrastructure (OGSI) : Introduction – OGSI Authorization and Attributes – Requirements – Standard and Specification of Attributes – OGSI Components – Web Service Resource Frame Work (WSRF)

UNIT IV **Hours:12**

Grid Implementation : Grid Computing Security – Introduction – Security Fundamentals – Authentication Schemes – Standard Protocols – Grid Taxonomy – Grid Security Infrastructure (GSI) – security – Web Service Security – Different Emerging Security Technologies in Grid – Globus Toolkit - Data Management – Resource Management – Information Services – Security – Architecture .

UNIT V **Hours:12**

Cluster : Introduction – History – Cluster organization – Desktop Supercomputing : Native Programming for grids – grid Enabling software applications – Managing Grid Environments – Grid Computing adoption in Research and Industry.

REFERENCE BOOKS (Recent Edition of the following books only are recommended)

S.No	Authors	Title	Publishers
1.	P.Venkata Krishna , M.Rajasekhara Babu, V.Saritha,	Principles of Grid Computing concepts and Applications	AneBooks Pvt.Ltd.2010.
2.	Ahmar Abbas	Grid Computing – A practical guide to technology and applications,	firewall Media , 2008
3.	Joshy Joseph, Craig Fellenstein	Grid Computing	Indian Edition 2004.
4.	MaoghenLI, Mark Baker	Grid Core Technologies	Indian Edition 2010

WEBSITE REFERENCE

1.https://www.Tutorialspoint.com/Grid Computing
2.https://www.bestcomputersciencedegrees.com
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SEMESTER – II

Programme code:	**M.Sc CS**	**Programme Title**	**Master of Computer Science**
Course Code:	24P2CSET1B	Elective 1: Neural Networks And Genetic Algorithm	Batch: 2024-2026
			Semester: II
Hrs/Week:	4 Hrs		Credits: 4

COURSE OBJECTIVES

- To introduce the fundamentals of neural networks, fuzzy systems, and genetic algorithms.
- To learn about the basics of neural networks and its applications and artificial neural

networks and its processes.

- To understand the concept of Genetic Algorithms.
- To understand the concepts of fuzzy sets, knowledge representation using fuzzy rules, approximate reasoning, fuzzy inference systems, and fuzzy logic control and other machine intelligence applications of fuzzy logic.
- To understand the basics of an evolutionary computing paradigm known as genetic algorithms and its application to engineering optimization problems.

COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Explain the basics of neural networks
CO2	Narrate the Characteristics of Neural Networks
CO3	Give a clear idea about the Fundamentals of Genetic Algorithms
CO4	Explain the architecture and application of Backpropogation Networks
CO5	Discuss about the ART architecture and relevant algorithms

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	L	H	H	M	M	H	L	H	L	L	M	H
CO2	L	H	H	M	M	H	L	H	L	L	M	H
CO3	L	H	H	M	M	H	L	H	L	L	M	H
CO4	L	H	H	M	M	H	L	H	L	L	M	H
CO5	L	H	H	M	M	H	L	H	L	L	M	H

H-High M-Medium L-Low

SYLLABUS

UNIT I **Hours :12**

Introduction : Neural Networks - Fundamentals Of Neural Networks : Basic Concepts of Neural Networks- Human Brain - Model Of an Artificial Neuron - Neural Network Architectures - Characteristics of Neural Networks - Learning Methods - Taxonomy of Neural Networks Architectures - History of Neural Networks Research - Early Neural Network Architectures (chapter : 1 & 2)

UNIT II **Hours:12**

Backpropogation Networks : Architecture of a Backpropogation Network – The perception Model – solution – single layer artificial neural network – Model for Multilayer Perception – Backpropogation Learning – Input Layer – Hidden Layer – output layer – Calculation of error-training of Neural Network - Illustration – Application (chapter 3)

UNIT III **Hours:12**

Backpropogation Networks: Effect of Tuning Parameter of the Backpropogation Neural Network – Selection of various parameter in BPN – Variations of Standard Backpropogation Algorithm-Research Direction.(chapter : 3)

UNIT IV **Hours:12**

Adaptive Resonance Theory : Introduction – Cluster Structure – Vector Quantization – Classical ART Networks – Simplifier ART Architecture - ART1 - Architecture – Special features of ART1 Models – Algorithms - ART2 - Architecture - Algorithms -Application. (chapter : 5)

UNIT V **Hours:12**

Genetic Algorithms : Fundamentals of Genetic Algorithms – History – Basic Concepts – Creation of offspring – working principle – Encoding – Fitness Functions – Reproduction. (chapter : 8)

REFERENCE BOOKS (Recent Edition of the following books only are recommended)

S.No	Authors	Title	Publishers
1.	S.Rajasekaran, G.A.Vijayalakshmi Pai	Neural Networks, Fuzzy Logic and Genetic Algorithms Synthesis and Applications	Prentice Hall of India PLTd, 2004.
2.	Simon Hhaykin	Neural Networks A comprehensive foundations	Pearson Education 2nd Edition 2004
3.	Li Min Fu	Neural Networks in Computer Intelligence	TMH 2003
4.	Fakhreddine O. Karray, Clarence De Silva	Soft Computing and Intelligent Systems Design	Pearson, 2009.
5.	Sivanandam.S.N and Deepa S. N	Principles of Soft Computing	Wiley India, 2008

WEBSITE REFERENCE

1.https://www.Tutorialspoint.com/Neural Networks-Genetic
2.https://www.w3schools.com

Means Of Curriculum Delivery: Lecture, Group Discussion, Seminar, Assignment, and Google Classroom

SEMESTER – II

Programme code:	**M.Sc CS**	**Programme Title**	**Master of Computer Science**
Course Code:	24P2CSET1C	Elective 1: E –Technologies	Batch: 2024-2026
			Semester: II
Hrs/Week:	4 Hrs		Credits: 4

COURSE OBJECTIVES

- To have an understanding of the Basics of E-Commerce and Technology infrastructure Required for implementing the same.

- To have a knowledge on various methods and strategies for selling on the web.
- To know about web server and software required for implementing E-Commerce.
- To Know in detail about various E-Marketing structures and E-Security.
- To improve the educational technology encompasses e-learning.

COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Demonstrate the knowledge on fundamental concepts of E-Commerce and infrastructure required for the same
CO2	Elucidate on various methods and strategies followed for selling on the web.
CO3	Explain about web server software and its functions
CO4	Enumerate various E-Marketing strategies
CO5	Explain about E-Business Strategy

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	L	H	H	M	L	H	L	H	M	M	M	H
CO2	L	H	H	M	L	H	L	H	M	M	M	H
CO3	L	H	H	M	L	H	L	H	M	M	M	H
CO4	L	H	H	M	L	H	L	H	M	M	M	H
CO5	L	H	H	M	L	H	L	H	M	M	M	H

H-High M-Medium L-Low

SYLLABUS

UNIT I **Hours: 12**

Introduction to Electronic Commerce: Electronic Commerce–Business Models, Revenue Models, and Business Processes – Economic Forces and Electronic Commerce – Identifying Electronic Commerce Opportunities – International Nature of Electronic Commerce. Technology Infrastructure: The Internet and the World Wide Web– Internet and World Wide Web – Packet – Switched Networks – Internet Protocols – Mark-up Languages and the Web – Intranets and Extranets – Internet Connection Options Internet2 and The Semantic Web. The Environment of Electronic Commerce: Legal, Ethical and Tax issues.

UNIT II **Hours: 12**

Selling on the Web: Revenue Models and Building a Web Presence – Marketing on the Web - Business– to – Business Strategies: From Electronic Data Interchange to Electronic Commerce – Online Auctions, Virtual Communities and Web Protocols: – Auction Overview – Online Auctions and Related Business – Virtual Communities and Web Portals.

UNIT III **Hours: 12**

Web Server Hardware and Software: – Software for Web Servers – Electronic Mail (E-Mail) – Web Site and Internet Utility Programs – Web Server Hardware. Electronic Commerce Software: Basic Functions of Electronic Commerce Software – Advanced Functions of Electronic Commerce Software – Electronic Commerce Software for Small and Midsize Companies – Electronic Commerce Software for Midsize to Large Businesses – Electronic Commerce for Large Businesses.

UNIT IV **Hours: 12**

E- Marketing: Traditional Marketing – Identifying Web Presence Goals – The Browsing Behavior Model – Online Marketing – E-Advertising - Internet Marketing Trends – Target Markets – E-Branding – Marketing Strategies. - E-security – E-Payment Systems: E-Customer Relationship Management: E Supply Chain Management.

UNIT V **Hours: 12**

E-Strategy: Information and Strategy – The Virtual Value Chain – Seven Dimensions of E-Commerce Strategy – Value Chain and E-Strategy – Planning the E-Commerce Project – E – Commerce Strategy and Knowledge Management – E-Business Strategy and Data Warehousing and Data mining.

REFERENCE BOOKS (Recent Edition of the following books only are recommended)

S.No.	Authors	Title	Publishers	Year of Publication
1.	Gary P. Schneider,	E-Commerce Strategy, Technology and Implementation	CENGAGE Learning INDIA Private Limited,. Latest Edition	2002
2	P.T. JOSEPH,	E-Commerce an Indian Perspective	Third Edition Prentice Hall of India, Latest Edition	1994
3	Mike Papazologn,	E-Business, Organizational and Technical Foundations,	Wiley India Pvt Ltd,	2008
4	Elias M. Awad, Electronic Commerce,	Electronic Commerce,	Prentice-Hall of India,	2008

WEBSITE REFERENCE

1.https://www.Tutorialspoint.com/E-Technologies
2.https://www.w3schools.com

Means Of Curriculum Delivery: Lecture, Group Discussion, Seminar, Assignment, and Google Classroom

SEMESTER - II

Programme code:	**M.Sc CS**	**Programme Title**	**Master of Computer Science**
Course Code:	24P2CSET1D	Elective 1: Cyber Law And Security Policy	Batch: 2024-2026
			Semester: II
Hrs/Week:	4 Hrs		Credits: 4

COURSE OBJECTIVES

- To understand the Concepts of Cyber Law and Data Security.
- To understand the Intellectual Property Rights, the Evidence and Criminal Aspect in

Cyber Law.

- To develop the understanding of relationship between commerce and cyberspace.
- To enable learner to understand, explore, and acquire a critical understanding Cyber Law.
- To explore the legal and policy developments in various countries to regulate Cyberspace.

COURSE OUTCOMES

On the successful completion of the course, students will be able

CO Number	CO Statement
CO1	State the History ,Features and Benefits of Cyber Law
CO2	Classify the various methods of providing security data
CO3	Explain the Criminal aspect in Cyber Law
CO4	Elucidate on global trends in Cyber law and information Technology Act
CO5	Explain the Information Technology Act

MAPPING WITH PROGRAMME OUTCOMES

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	L	H	H	L	L	H	M	H	M	M	H	H
CO2	L	H	H	L	L	H	M	H	M	M	H	H
CO3	L	H	H	L	L	H	M	H	M	M	H	H
CO4	L	H	H	L	L	H	M	H	M	M	H	H
CO5	L	H	H	L	L	H	M	H	M	M	H	H

H-High M-Medium L-Low

SYLLABUS

UNIT I **Hours: 12**

Concept of cyber law and space : Introduction – Meaning – Features – Significant of cyber law – Advantages of cyber law – Cyber law governance – Cyber space – meaning – Inclusive of cyber space – Facilitating functions of cyber space – Major issues in cyber space - E commerce & Cyber law : Meaning – History – Division – Benefits – Major Issues – E commerce in India – Privacy Factor – cyber law in E-commerce – contract – meaning – Essentials of online contract.

UNIT II **Hours: 12**

Data Security : Meaning – Fundamental requirements – Precautions – Encryption – Advantages of Encryption technology – Means of encryption of data – Public key Infrastructure – Cyber Security issues in India – Digital signature – Features– Types– Components of a Digital Signature Certificate – Use of Digital Signature Certificate – Intellectual Property Rights : Introduction – Laws - Law Firms – Need of Intergovernmental Intellectual Property Organization – Mission of WIPO – Global Innovation Index(GII) – Advantages of GII – Electronic Copyright Management System(ECMS) – Advantages – Indian Copy Rights Act on Soft Property Works - Indian Patents Act on Soft Property Works.

UNIT III **Hours: 12**

The Evidence Aspect in Cyber Law: Evidence as Part of the Law of Procedures – Applicability of the Law of Evidence on Electronic Records - The Indian Evidence Act – The Criminal Aspect in Cyber Law: What is Crime? – What is Computer Crime – Factors Contributing to Computer Crime - Strategy for prevention of Computer crime – Amendments.

UNIT IV **Hours: 12**

Global Trends in Cyber Law: The Contract Aspect – The Security Aspect – The Intellectual Property Aspects – The Criminal Aspect – Global Miscellany – Legal Framework for Electronic Data Interchange : The EDI Mechanism – The Electronic Data Interchange Scenario in India.

UNIT V **Hours: 12**

The Information Technology Act : Definition – Authentication of electronic records Electronic Governance – Attributes, Acknowledgment and dispatch of Electronic Records – Secure Electronic Records and Secure Digital Signatures – Digital Signature Certificates.

REFERENCE BOOKS (Recent Edition of the following books only are recommended)

S.No.	Authors	Title	Publishers	Year of Publication
1.	Dr.B.Kirubashini., P.Kavitha	Cyber Law	Nandhini Pathippagam,	2013
2	Suresh T.Viswanathan., N.Chanrababu Naidu	Cyber Law	Bharath Law House PVT .LTD	2001

WEBSITE REFERENCE

1.https://ocw.mit.edu/courses/Computer-science/cyberlaw
2.https://www.bestcomputersciencedegrees.com

Means Of Curriculum Delivery: Lecture, Group Discussion, Seminar,Assignment,Case studies and Google Classroom.

SEMESTER – II

Programme code:	M.Sc CS	Programme Title	Master of Computer Science	
Course Code:	24P2CSET1E	Elective1:Wireless Networking Technology	Batch:	2024-2026
			Semester:	II
Hrs/Week:	4 Hrs		Credits:	4

COURSE OBJECTIVES

- Build an understanding of the fundamental concepts of computer networking.
- Familiarize the student with the basic taxonomy and terminology of the computer networking area.

- Introduce the student to advanced networking concepts, preparing the student for entry Advanced courses in computer networking.
- Independently understand basic computer network technology.
- Identify the different types of network topologies and protocols.
- Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.

COURSE OUTCOMES

CO Number	CO Statement
CO1	Explain the fundamental concepts of 5G technology
CO2	Describe concepts of 5G security models and types of security
CO3	Learning 5G Applications and Architectures:
CO4	Concepts of Traditional WAP Networking Environment
CO5	Describe Features for a Secured Wireless Communications System

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	M	H	H	H	M	H	M	H	M	H	M	H
CO2	M	H	H	H	M	H	M	H	M	H	M	H
CO3	M	H	H	H	M	H	M	H	M	H	M	H
CO4	M	H	H	H	M	H	M	H	M	H	M	H
CO5	M	H	H	H	M	H	M	H	M	H	M	H

SYLLABUS

Unit I **Hours: 12**

Introduction- Evolution of Cellular Technologies-Issues and Challenges of 5G -Features of 5G Technology. The Significance of 5G Security-The Need for Security.5G Security Standardization-Internet Engineering Task Force. Security Characteristics of 5G-Drivers of 5G-Significance of Security and Privacy

Unit II **Hours: 12**

Network Planning- Objectives-Planning Inputs-Planning Outputs. Types of Network Planning-5G Roadmap-Need for Roadmap-Roadmap Process-Existing Concepts of 5G-Cognitive Radio Network-Security Models-Identity Management-UE Security-Radio Network Security-Flexible and Scalable Security-Network Slicing Security-Vitality Effective Security-Cloud Security

Unit III **Hours: 12**

Security Protocols-Channel Security-Massive MIMO-Full Duplex Technology. 5G Applications and Architectures: Brief Introduction to 5G-Applications-Novel Architectures and Implications-Cross-Layer Design-SDN-NFV-Based Models-Network function virtualization-Service Architectures and Potential Direction

Unit IV: **Hours: 12**

Wireless Application Protocol: Introduction-WAP and the World Wide Web (WWW)-Introduction to Wireless Application Protocol-The WAP Programming Model-Traditional WAP Networking Environment-WAP Advantages and Disadvantages-Applications of WAP-imode-imode versus WAP

Unit V **Hours: 12**

Security in Wireless Systems: Introduction-Security and Privacy Needs of a Wireless System-Required Features for a Secured Wireless Communications System-Methods of Providing Privacy and Security in Wireless Systems-Wireless Security and Standards-IEEE 802.11 Security-Security in North American Cellular/PCS Systems-Security in GSM, GPRS, and UMTS-Data Security

REFERENCE BOOKS

S.No.	Authors	Title	Publishers	Year of Publication
1.	Dushantha Nalin K. Jayakody Kathiravan Srinivasan	5G Enabled Secure Wireless Networks	Springer Nature Switzerland	2019
2	Shilin Wang , Yunfei Cai , Youyun Xu Yuanyang Cai	Wireless Communication Network Technology and Evolution	World scientific	2022

WEBSITE REFERENCE

1. https://doi.org/10.1007/978-3-030-03508-2
2. https://doi.org/10.1142/12496

Means Of Curriculum Delivery: Lecture, Group Discussion, Seminar, Assignment, Case studies and Google Classroom

SEMESTER – III

Programme code:	M.Sc CS	Programme Title	Master of Computer Science	
Course code:	24P3CSET2A	**ELECTIVE 2:** SOFTWARE PROJECT MANAGEMENT	Batch	2024-2026
			Semester	III
Hrs/Week:	4 Hrs		Credits	4

Course Objectives

1. To get knowledge of how to handle project development activities. To understand the

threats and opportunities in Project managements.

2. To study various project cost, time estimation models and how to make quality software.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	To understand the activities of
CO2	To Apply the knowledge of Project evaluation
CO3	Analyse the Business Process Re-engineering
CO4	To Evaluate the knowledge of Planning and implementation Projects
CO5	To Create the Mobile module by Managing Projects

Mapping Outcome

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	M	H	H	H	M	H	M	H	M	H	M	H
CO2	M	H	H	H	M	H	M	H	M	H	M	H
CO3	M	H	H	H	M	H	M	H	M	H	M	H
CO4	M	H	H	H	M	H	M	H	M	H	M	H
CO5	M	H	H	H	M	H	M	H	M	H	M	H

Syllabus

UNIT 1 **Hours:10**

SOFTWARE PROJECT MANAGEMENT : Introduction, Need for Software Project Management – Software Project versus other projects – Overview of Project planning. SDLC Models: Waterfall model, V shaped model, Prototype model, Iterative model, Spiral model and Agile Model

UNIT II **Hours:10**

PROJECT EVALUATION : Introduction, Strategic assessment, Technical Assessment, Cost benefit Analysis, Cash flow forecasting, Cost benefit Evaluation Techniques Risk Evaluation – Selection of appropriate project planning.

UNIT III **Hours:14**

ACTIVITY PLANNING : Objectives of activity planning, Project schedules, Projects and activities, Sequencing and scheduling activities, Network Planning models –Formulating network models, Using dummy activities, Identifying critical path, identifying critical activities. Risk Analysis and Management: Nature of risk, Managing risk, Risk identification, Risk analysis,
reducing the risks, evaluating the risks.

UNIT IV **Hours:14**

SOFTWARE EFFORT ESTIMATION: Problems with over and under estimate, the basis for software estimation, software estimation Techniques. Expert judgments, Estimating by analogy, Function point analysis. Resource Allocation: Identifying resource requirements,

Scheduling resources, Monitoring and control, Managing people and organization teams.

UNIT V

Hours:12 PROJECT MANAGEMENT : Project Management in the Testing phase – Introduction, test scheduling, test types, issues, management structures for testing, metrics for testing phase, Project Management in the Management phase – Introduction, activities, management issues, configuration management, estimating size, effort and people resources, advantages, metrics.

Reference Books (Recent Edition of the following books only are recommended)

S.No	Authors	Title	Publishers
1.	Bob Hughes and Mike Cotterell	Software Project Management	Hill 5th Edition, Tata McGraw
2.	Gopalaswamy Ramesh	Managing Global Software Projects	2001, TMH
3.	Walker Royce	Software Project Management	1998, Addison Wesley
4.	Stellman& Greener	Applied software project management	SPD

SEMESTER – III

Programme code:	M.Sc CS	Programme Title	Master of Computer Science	
Course Code:	24P3CSET2B	Elective 2: ENTERPRISE RESOURCE PLANNING	Batch	2024-2026
			Semester	III
Hrs/Week:	4 Hrs		Credits	4

Course Objectives

- To understand capability to streamline the different organizational processes and work flows in ERP.

- To learn about the improved efficiency, performance, and productivity levels of ERP.
- To know the basics of ERP, key implementation, business modules and future trends in ERP.
- To provide a contemporary and forward-looking on the theory and practice of Enterprise Resource Planning Technology.
- To focus on a strong emphasis upon practice of theory in Applications and Practical-oriented approach.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	To understand the Functional Module, ERP Market and Vendors
CO2	To Apply the knowledge of ERP Services
CO3	Analyse the Business Process Re-engineering And ERP
CO4	To Evaluate the knowledge of Planning and implementation of ERP
CO5	To Create the Mobile module by Managing ERP Projects

Mapping Outcome

CO & PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	M	H	H	H	M	H	M	H	M	H	M	H
CO2	M	H	H	H	M	H	M	H	M	H	M	H
CO3	M	H	H	H	M	H	M	H	M	H	M	H
CO4	M	H	H	H	M	H	M	H	M	H	M	H
CO5	M	H	H	H	M	H	M	H	M	H	M	H

Syllabus

UNIT 1 **Hours:9**

Introduction ERP, An Overview, Enterprise – An Overview, Benefits of ERP, ERP and Related Technologies, Business Process Reengineering (BPR), Data Warehousing, Data Mining, OLAP, SCM.

UNIT II **Hours:9**

ERP implementation, ERP Implementation Lifecycle, Implementation Methodology, Hidden Costs, Organizing the Implementation, Vendors, Consultants and Users, Contracts with Vendors, Consultants and Employees, Project Management and Monitoring

UNIT III **Hours:9**

The business modules ,Business modules in an ERP Package, Finance, Manufacturing, Human Resources, Plant Maintenance, Materials Management, Quality Management, Sales and Distribution.

UNIT IV **Hours:9**

The ERP market, ERP Market Place, SAP AG, People soft, Baan, JD Edwards, Oracle, QAD, SSA.

UNIT V **Hours:9**

ERP– present and future, Turbo Charge the ERP System, EIA, ERP and e-Commerce, ERP and Internet, Future Directions.

Reference Books (Recent Edition of the following books only are recommended)

S.No	Authors	Title	Publishers
1.	Alexis Leon	ERP Demystified" II Edition	Tata McGraw Hill, New Delhi, 2000.
2.	Joseph A Brady, Ellen F Monk, Bret Wagner	Concepts in Enterprise Resource Planning	Thompson Course Technology, USA, 2001
3.	Vinod Kumar Garg and Venkitakrishnan N K	Enterprise Resource Planning – Concepts and Practice	PHI, New Delhi, 2003

SEMESTER – III

Programme code:	M.Sc CS	Programme Title	Master of Computer Science	
Course Code:	24P3CSET2C	**Elective 2:** Software Testing	Batch	2024-2026
			Semester	III
Hrs/Week:	4 Hrs		Credits	4

COURSE OBJECTIVES

- To study fundamental concepts in software testing, including software testing objectives, process, criteria, strategies, and methods.
- To discuss various software testing issues and solutions in software unit test, integration, regression, and system testing.
- To understand software test automation problems and solutions.
- To learn how to write software testing documents, and communicate with engineers in various forms.
- To gain the techniques and skills on how to use modern software testing tools to support software testing projects.

COURSE OUTCOMES

On the successful completion of the course, students will be able to achieve the following Outcomes

CO Number	CO Statement
CO1	Investigate the reason for bugs and analyse it for preventing and remove the bugs
CO2	Implement various test process for quality standard
CO3	Designing test plan for various problems
CO4	Manage test case and process
CO5	Understanding testing techniques

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	M	H	H	H	M	H	M	H	M	H	M	H
CO2	M	H	H	H	M	H	M	H	M	H	M	H
CO3	M	H	H	H	M	H	M	H	M	H	M	H
CO4	M	H	H	H	M	H	M	H	M	H	M	H
CO5	M	H	H	H	M	H	M	H	M	H	M	H

SYLLABUS

UNIT I **Hours:12**

Software Development Life Cycle models: Phases of Software project – Quality, Quality Assurance, Quality control – Testing, Verification and Validation – Process Model to represent Different Phases - Life Cycle models. White-Box Testing: Static Testing – Structural Testing – Challenges in White-Box Testing.

UNIT II **Hours:12**

Black-Box Testing: What is Black-Box Testing? - Why Black-Box Testing? – When to do Black-Box Testing? – How to do Black-Box Testing? – Challenges in White Box Testing - Integration Testing: Integration Testing as Type of Testing – Integration Testing as a Phase f Testing – Scenario Testing – Defect Bash.

UNIT III **Hours:12**

System and Acceptance Testing: system Testing Overview – Why System testing is done? – Functional versus Non-functional Testing - Functional testing - Non-functional Testing – Acceptance Testing – Summary of Testing Phases.

UNIT IV **Hours:12**

Performance Testing: Factors governing Performance Testing – Methodology of Performance Testing – tools for Performance Testing – Process for Performance Testing – Challenges. Regression Testing: What is Regression Testing? – Types of Regression Testing – When to do Regression Testing – How to do Regression Testing – Best Practices in Regression Testing.

UNIT V **Hours:12**

Test Planning, Management, Execution and Reporting: Test Planning – Test Management – Test Process – Test Reporting –Best Practices. Test Metrics and Measurements: Project Metrics – Progress Metrics – Productivity Metrics – Release Metrics.

TEXT BOOKS: (Recent Edition of the following books only are recommended)

S.No	Authors	Title	Publishers
1.	Srinivasan Desikan & Gopalswamy Ramesh	Software Testing Principles and Practices	Pearson Education

REFERENCE BOOKS

S.No	Authors	Title	Publishers
1.	William E. Perry	Effective Methods of Software Testing	Wiley India
2.	Renu Rajani, Pradeep Oak,	Software Testing	TMH, 2007

WEBSITE REFERENCE

1. https://www.tutorialspoint.com/sotwaretesting/

Means Of Curriculum Delivery: Lecture, Group Discussion, Seminar,Assignment,Case studies and Google Classroom

SEMESTER – III

Programme code:	M.Sc CS	Programme Title	Master of Computer Science	
Course Code:	24P3CSET2D	Elective 3: ANDROID AND ITS APPLICATION	Batch:	2024-2026
			Semester:	III
Hrs/Week:	4 Hrs		Credits:	4

COURSE OBJECTIVES

- On Successful Completion of this subject the students should have knowledge on Android Concepts.
- To enable the students to write android based script for application development.
- To make the students learn and understand eclipsed based IDE programming for the android environment.
- Familiarize with Android's APIs for data storage, retrieval, user preferences, files and content providers.
- To develop a grasp of the Android OS architecture and application development lifecycle

COURSE OUTCOMES

On the successful completion of the course, students will be able to

CO Number	CO Statement
CO1	Explain the Basics of Programming and development environment in Android
CO2	designed for students to learn how to build Android apps in a professional Manner.
CO3	tto impart knowledge of User interface, Activity , Views, Services and SQLite.
CO4	Manage test case and process
CO5	Understanding testing techniques

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	M	H	H	H	M	H	M	H	M	H	M	H
CO2	M	H	H	H	M	H	M	H	M	H	M	H
CO3	M	H	H	H	M	H	M	H	M	H	M	H
CO4	M	H	H	H	M	H	M	H	M	H	M	H
CO5	M	H	H	H	M	H	M	H	M	H	M	H

SYLLABUS

UNIT I **Hours:12**

INTRODUCTION TO ANDROID What is Android - History and Version - Installing software's - Setup Eclipse - Hello Android example - Internal Details - Dalvik VM -Software Stack - Android Core Building Blocks - Android Emulator -AndroidManifest.xml - R.java file - Hide Title Bar - Screen Orientation.

UNIT II **Hours:12**

WIDGETS & USER INTERFACE Working with Button - Toast - Custom Toast - Button - Toggle Button -Switch Button - Image Button - CheckBox - AlertDialog - Spinner - AutoCompleteTextView - RatingBar - DatePicker - TimePicker -ProgressBar - Quick Contact Budge -Analog Clock and Digital Clock -Working with hardware Button - File Download

UNIT III **Hours:12**

ACTIVITY, INTENT & FRAGMENT Activity Lifecycle - Activity Example - Implicit Intent - Explicit Intent - Fragment Lifecycle –Fragment Example - Dynamic Fragment . Android Menu.**LAYOUT&VIEW-**Option Menu - Context Menu - Popup Menu - Relative Layout – Linear Layout - Table Layout - Grid Layout

UNIT IV **Hours:12**

ANDROID ADAPTOR VIEW Array Adaptor - Array List Adaptor - Base Adaptor - Grid View - WebView - Scroll View - Search View - TabHost - Dynamic List View - Expanded ListView.**AN-DROID SERVICES**Android Service - Android Service API - Android Started Service -Android Bound Service - Android Service Life Cycle - Android Service Example

UNIT V **Hours:12**

Data Storage - Shared Preferences - Internal Storage - External Storage.**SQLite** - SQLite API - SQLite Spinner - SQLite List View - API - Android Web Services

REFERENCE BOOKS (Recent Edition of the following books only are recommended)

S.No	Authors	Title	Publishers
1.	-	Android Developer Fundamental course - Learn to Develop Android Application	Google Developer Training Team 2016.
2.	John Wiley& Sons	Android Application Development for Dummies	3rd Edition published Inc.2015
3.	John Horton	Android Programming for Beginners	December 2015
4.	Matthew Gimson	Complete Introduction for Beginners –Step By Step Guide How to Create Your Own Android App Easy!	2015

WEBSITE REFERENCE

1.https://commonsware.com/andtutorials-3_1-CC.pdf.
2. https://www.cs.cmu.edu/BFeiginMobile Developement.pdf.
3.https://www.tutorialspoint.com/android_tutorial.pdf.

Means Of Curriculum Delivery: Lecture, Group Discussion, Seminar, Assignment, Case studies and Google Classroom**.**

SEMESTER III

Programme Code :	**M.Sc CS**	**Programme Title**	**Master of Science (Information Technology)**	
Course Code :	24P3CSET2E	**Elective 2 : Intrusion Detection System**	**Batch**	2024-2026
			Semester	III
Hrs/week	**4**		**Credits**	4

COURSE OBJECTIVES

To enable the students

- To be familiar with the students a hands-on exposure to the mathematical principles and techniques.
- To design and implement network traffic for suspicious activity and alerts
- To justify the applicability, or non-applicability, of Intrusion Detection System for a specific application.
- To understand where the Intrusion Detection System could be effectively utilized by illustrations of applications of Intrusion Detection System

COURSE OUTCOMES (CO)

On successful completion of the course, students should be able to

CO Number	CO Statement
CO1	Explain various Intrusion Detection System Consortium, Principles, and Responsibility
CO2	Know the application, Vulnerability Scanners in assessing the Economic Strategy and Satisfaction.
CO3	Describe the grounding in the architecture of the Intrusion Detection System, and exposure to various implementations of the infrastructure.
CO4	Evaluate the Practical Integration Issues
CO5	Explain the case study of Intrusion Detection System.

MAPPING WITH PROGRAMME OUTCOMES

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	L	H	H	H	H	M	M	M	H	H	H	H
CO2	L	H	H	H	H	M	M	M	H	H	H	H
CO3	L	L	H	H	H	M	M	M	H	H	H	H
CO4	L	H	H	H	H	M	M	M	H	H	H	H
CO5	L	H	H	H	H	M	M	M	H	H	H	H

SYLLABUS

Unit-1 **Hours:10**

Introduction- ICSA. net's Intrusion Detection System Consortium-Policy is Key: Management Direction-Policy Development-Statement of Scope-Acceptable computer and network use-Detection and Reporting Requirements-Responsibility for responding to incidents-Responsibility

for managing incident response.

Unit-2 **Hours:10**

Technology overview-Technology Landscape-Intrusion Detection Systems: Network IDS-Host IDS-File integrity checkers-Vulnerability Scanners-Network Vulnerability Scanner-Host Vulnerability Scanner-

Unit-3 **Hours:10**

Debunking Marketing Hype: Realistic benefits-Unrealistic expectations-Guidelines for Selecting Products: Managing issues-Technical Issues-Website issues-IDS Product Decision Trees

Unit-4 **Hours:10**

Practical Integration Issues: Sensor Placement for a network IDS-Host Integration for Host IDS-Alarm Configuration-Integration Schedule.

Unit-5 **Hours:10**

Case Study: Integrity Analysis-Vulnerability Assessment-Host-based Intrusion Detection-IDS Market Share and Industry Growth: Introduction-The Market.

REFERENCE BOOKS

S. No.	Author Name	Title of the Book	Publisher
1.	Buyers Guide	Intrusion Detection System	ICSA.net industry guides

WEBSITE REFERENCES

1. https://www.icsa.net/intrusion *detection system*
2. https://techterms.com/definition/ intrusion detection system

Means of Curriculum Delivery : Lecture, Group Learning, Seminar, Assignment, Case studies, Google classroom.