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.

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 Continous 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**

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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 (Information Technology) (2024-2026)

Part	Course Code	Title of the Course	Hours per week	CIA	Exam	Total	Credits
Semester – I							
III	24P1ITCT01	**Core 1:** Advanced Java Programming	5	25	75	100	4
	24P1ITCT02	**Core 2:** Network Security	5	25	75	100	4
	24P1ITCT03	**Core 3:** Cyber laws and Security Policies	5	25	75	100	3
	24P1ITCT04	**Core 4:** Design and Analysis of Algorithms	5	25	75	100	4
	24P1ITCP05	**Core 5:** Advanced Java Programming - Practical	4	40	60	100	4
	24P1ITCP06	**Core 6:** Design and Analysis of Algorithms –Practical	4	40	60	100	3
	24P1ITCP07	**Core 7:** Open Source Tools Practical	2	20	30	50	2
V	-	Library Work	6	-	-	-	-
		Total	**36**			**650**	**24**
Semester – II							
III	24P2ITCT08	**Core 8:** Distributed Computing and Linux	4	25	75	100	4
	24P2ITCT09	**Core 9:** Python Programming	4	25	75	100	4
	24P2ITCT10	**Core 10:** Object Oriented Analysis and Design	4	25	75	100	3
	24P2ITCT11	**Core 11:** Big Data Analytics	4	25	75	100	4
	24P2ITCP12	**Core 12:** Linux- Practical	4	40	60	100	3
	24P2ITCP13	**Core 13:** Python programming – Practical	4	40	60	100	3
	24P2ITCP14	**Core 14:** MATLAB Practical	2	20	30	50	2
		Elective 1	4	25	75	100	4
V	-	Library Work	6	-	-	-	-
		Total	**36**			**750**	**27**
Semester – III							
III	24P3ITCT15	Core 15: Web Data Mining	4	25	75	100	4
	24P3ITCT16	Core16:Advanced Computer Networks	4	25	75	100	4

	24P3ITCT17	Core 17: Internet of Things	4	25	75	100	4
	24P3ITCT18	Core 18: Web Programming	4	25	75	100	3
	24P3ITCP19	Core 19: Network – Practical	4	40	60	100	3
	24P3ITCP20	Core 20: Web Programming – Practical	4	40	60	100	3
	24P3ITCP21	Core 21: Cloud Computing Practical	2	40	60	100	2
		Elective 2:	4	25	75	100	4
	24P3OLCT01	Online Course (NPTEL/Swayam/Spoken Tutorial/Udemy/UDx/Course Era,etc)	--	--	--	--	--
V	-	Library Work	6	-	-	-	-
		Total	**36**		**800**		**27**
		Semester – IV					
III	24P4ITCV22	**Core 22:** Project and Viva Voce	30	160	40	200	12
	-	Project Review Work	6	-	-	-	-
			Total			**200**	**12**
		Total			**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.	24P2ITET1A	Grid Computing
2.	24P2ITET1B	Introduction to Robotics
3.	24P2ITET1C	Bioinformatics
4.	24P2ITET1D	Wireless Communication
5.	24P2ITET1E	Advanced Database Technology

Semester – III (Elective II)		
List of Elective Courses		
S.No	**Course Code**	**Name of the Course**
1.	24P3ITET2A	Soft Computing
2.	24P3ITET2B	Embedded System
3.	24P3ITET2C	Cloud Computing
4.	24P3ITET2D	Software Quality Assurance
5.	24P3ITET2E	Digital Forensics

EXTRA CREDIT COURSES		
Course Code	**Subjects**	**Credits**
2024ECC001	சுற்றுலா வளர்ச்சி	2
2024ECC002	இதழியல் கலை	2
2024ECC003	நாட்டுப்புறவியல்	2
2024ECC004	கணிப்பொறியில் தமிழ்	2
2024ECC005	தமிழக வரலாறும் மக்கள் பண்பாடும்	2
2024ECC006	தமிழ் இலக்கிய வரலாறு	2
2024ECC007	New Media	2
2024ECC008	Proof reading And Copyediting	2
2024ECC009	Personality Development	2
2024ECC010	Technical Writing	2
2024ECC011	An Introduction To Psychology	2
2024ECC012	Astronomy	2
2024ECC013	Fuzzy Mathematics	2
2024ECC014	Operation Research	2
2024ECC015	Mathematics For Professional Courses	2
2024ECC016	Multimedia And Its Applications	2
2024ECC017	Management Information System	2
2024ECC018	Theory Of Computation	2
2024ECC019	Oops With Java Programming	2
2024ECC020	Programming in C	2
2024ECC021	Internet of Things	2
2024ECC022	Web Technology And Its Applications	2
2024ECC023	Network Security	2
2024ECC024	Mobile And Wireless Technology	2
2024ECC025	Cloud Computing	2
2024ECC026	Cross Culture Management	2
2024ECC027	Indian Economy And Trade Dependencies	2
2024ECC028	Export Marketing	2
2024ECC029	International Trade & Forex	2
2024ECC030	Brand Management	2
2024ECC031	Stress Management	2
2024ECC032	Risk And Insurance In International Trade	2
2024ECC033	Retail Marketing	2
2024ECC034	Export And Import Procedures	2
2024ECC035	Logistics And Supplychain Management	2

2024ECC036	Quality Management	2
2024ECC037	Management of Small And New Enterprises	2
2024ECC038	Tourism Management	2
2024ECC039	Event Management	2
2024ECC040	Hospitality Management	2
2024ECC041	Consumer Behaviour	2
2024ECC042	Human Resource Management	2
2024ECC043	Principles And Practice Of Marketing Services	2
2024ECC044	Consumer Marketing	2
2024ECC045	Marketing of Health Services	2
2024ECC046	International Banking	2
2024ECC047	E-Commerce	2
2024ECC048	International Accounting	2
2024ECC049	Corporate Social Responsibility And Governance	2
2024ECC050	Enterprise Resource Planning	2
2024ECC051	கல்வியும் சமுதாயமும்	2
2024ECC052	அறிவியல்தமிழ்	2
2024ECC053	பெண்ணியம்	2
2024ECC054	தமிழகவரலாறு - **1**	2
2024ECC055	தமிழகவரலாறு -2	2
2024ECC056	Manitha Vaalkaiyum Gandhiadigalum	2
2024ECC057	V.O.Chidambarathin Vaalkai Varalaaru	2
2024ECC058	Nethaji Subash Chandrabosin Vaalkai Varalaaru	2
2024ECC059	A.P.J.Abdul Kalamin Vaalkai Varalaaru	2
2024ECC060	E.V.R Periyarin Vaalkai Varalaaru	2
2024ECC061	Kamarajarin Vaalkai Varalaaru	2
2024ECC062	Vallabai batel Vaalkai Varalaaru	2
2024ECC063	Dr.Muthulakshmi Reddy-in Vaalkai Varalaaru	2
2024ECC064	Bharathiyarin Vaalkai Varalaaru	2
2024ECC065	An Introduction to Constitution of India	2
2024ECC066	Consumer Affairs	2
2024ECC067	Personal and Family Ethics	2
2024ECC068	Professional and Social Ethics	2
2024ECC069	National and Global Ethics	2

SEMESTER I

SEMESTER I

Programme Code	**M.Sc IT**	**Programme Title**	**Master of Science (Information Technology)**	
Course Code	**24P1ITCT01**	**Core 1 : Advanced Java Programming**	**Batch**	**2024-2026**
			Semester	**I**
Hrs/week	**5**		**Credits**	**4**

COURSE OBJECTIVES

To enable the students

- To provide an in-depth knowledge about the concepts of language structure, program divisions of JAVA.
- Ability to design console based, GUI based programming language and Web based applications
- Understand the concept of JSP, Servlet Basics and JDBC and Inter Servlet Communications.
- Understand the Java Bean Component model.

COURSE OUTCOMES (CO)

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

CO Number	**CO Statement**
CO1	Explain the fundamental concepts of Java language.
CO2	Use GUI components from AWT and Swing including buttons and text components
CO3	Illustrate the methods to send and receive data through sockets
CO4	Describe the concept of JSP, Servlet Basics and JDBC
CO5	Summarize the concepts of Java Bean

MAPPING WITH PROGRAMME OUTCOMES

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

L-Low M-Medium H-High

SYLLABUS

UNIT - I **(Hours : 10)**

Introduction to Advanced Java Programming:OverView of the Java Platform, A Brief History of the Java Platform, Object-Oriented Programming in Java,Standard SDK ToolsClasses and

Objects-Introduction, classes and Object-Oriented Programming,Using Constructors and Finalizers,Reference Objects and the Garbage Collector.

UNIT - II **(Hours : 12)**

Common Elements of Graphical User Interfaces:Introduction, Main features and Technology of GUI, Introducing the Java foundation classes, Event Model, JFC Sample programs, Layout managers, Events. Swing–EventHandling,J-Frames,Lists,Tables,Trees, Text Components- Progress Indicator.

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

Networking Programming:Introduction- Working with URLs, Working with Sockets-Remote Method-Invocation

UNIT - IV **(Hours : 12)**

JSP Fundamentals: JSP Overview and Architecture – JSP Implicit Objects – JSP Standard Actions – Handling JSP Errors- Custom JSP Tag. Servlet Fundamentals: Servlet Overview and Architecture- Servlet Basics – JDBC and Inter – Servlet Communications.

UNIT - V **(Hours : 12)**

JavaBeans:Introduction,JavaBeans Component Model,Bean Development Environments,Using the Sun BeanBox, Creating a JavaBean Class,Exploring JavaBean Property Types, JDBC-Design of JDBC -Configuration-Executing SQL Statemetns.

REFERENCE BOOKS

S. No	Author Name	Title of the Book	Publisher
1.	Joe Wiggles Worth and Paula Mc Millan	Java programming: Advanced Topics	Thomson
2.	CayS.Horstmans, Gary Coronell	Core Java Volume II -Advanced Features	PearsonEducation
3.	James Goodwill	Developing Java Servlets	Techmedia Publication
4.	Uttam K. Roy	Advanced Java Programming	Oxford University Press

WEBSITE REFERENCES

- https://www.linkedin.com/learning/advanced-java-programming
- https://www.quora.com/in/What-is-advanced-Java
- https://www.javatpoint.com/servlet-tutorial
- https://www.tutorialspoint.com/servlets/
- https://docs.oracle.com/javase/7/docs/technotes/guides/idl/corba.html

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

SEMESTER I

Programme Code :	**M.Sc IT**	**Programme Title**	**Master of Science (Information Technology)**	
Course Code :	**24P1ITCT02**	**Core 2: Network Security**	**Batch**	**2024-2026**
			Semester	**I**
Hrs/week	**5**		**Credits**	**4**

COURSE OBJECTIVES

To enable the students

- Understand the fundamental principles of network, various network, cryptographic techniques, authentication and its standards.
- Understand the various methods of password management and protocols to maintain system security
- Understand various types of attacks and their characteristics
- Learn the security concepts exposed to original research in network security

COURSE OUTCOMES (CO)

On successful completion of the course the student should be able to

CO Number	**CO Statement**
CO1	Explain various types of attacks and their characteristics
CO2	Illustrate the basic concept of encryption and decryption for secure data transmission.
CO3	Describe the fundamentals of secret and public cryptography
CO4	Describe the various methods of password management and protocols to maintain system security
CO5	Survey the security concepts exposed to original research in network security

MAPPING WITH PROGRAMME OUTCOMES

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

L-Low M-Medium H-High

SYLLABUS

UNIT - I **(Hours:10)**

Introduction – Primer on Networking –Active and Passive Attacks -Possible Types of Attacks–Layers and Cryptography – authorization Viruses, worms, Trojan Horses.

UNIT - II **(Hours:10)**

Cryptography :Plain text and Cipher Text, Substitution techniques, Caesar Cipher, Mono-alphabetic Cipher, Polygram, Polyalphabetic Substitution, Playfair, Hill Cipher, Transposition techniques, Encryption and Decryption, Steganography, Key Range and Key Size.

UNIT - III **(Hours:12)**

Symmetric Key Algorithms and AES:Algorithms types and modes, Overview of Symmetric key Cryptography, Data Encryption Standard (DES), International Data Encryption Algorithm (IDEA), RC4, RC5, Blowfish, Advanced Encryption Standard (AES) Asymmetric Key Algorithms, Digital Signatures and RSA: Brief history of Asymmetric Key Cryptography, Overview of AsymmetricKey Cryptography, RSA algorithm, Symmetric and Asymmetric key cryptography together, Digital Signatures, Knapsack Algorithm.

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

User Authentication and Kerberos: Authentication basics, Passwords, Authentication Tokens, Certificate-based Authentication, Biometric Authentication, Kerberos, Key Distribution Center (KDC) , Security Handshake Pitfalls, Single Sign On (SSO) Approaches.

UNIT - V **(Hours:12)**

Network Security: Firewalls and Virtual Private Networks: Brief Introduction to TCP/IP, Firewalls, IP Security, Virtual Private Networks (VPN), Intrusion. Internet Security Protocols: Basic concepts, Secure Socket Layer (SSL), Transport Layer Security (TLS), Secure Hyper Text Transfer Protocol (SHTTP), Time Stamping Protocol (TSP), Secure Electronic Transaction (SET), SSL vs SET, 3-D Secure Protocol, Electronic Money, E-mail Security, Wireless Application Protocol (WAP) Security, Security in GSM, Security in 3G .

REFERENCE BOOKS

S.No	Author Name	Title of the Book	Publisher
1	Atul Kahate	Cryptography and Network Security	Tata Mc.Graw Hill
2	Charlie Kaufman, Radia Perlman and Mike Speciner	Network Security Private Communication in a Public World	Pearson Education, New Delhi
3	Stallings William	Cryptography and Network Security Principles and Practices	Prentice Hall India, New Delhi
4	Stallings William	Network Security Essentials Applications and Standards	Prentice Hall India, New Delhi
5.	V.K.Pachghare	Cryptography and Information Security	PHI , New Delhi

WEBSITE REFERENCES

- https://www.go4expert.com/articles/types-of-attacks
- https://www.tutorialspoint.com/cryptography

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

SEMESTER I

Programme Code	M.Sc IT	Programme Title	Master of Science (Information Technology)	
Course Code	24P1ITCT03	Core 3 : Cyber Laws and Security Policies	Batch	2024-2026
Hrs/week	5		Semester	I
			Credits	3

COURSE OBJECTIVES

To enable the Students

- Understand the Basics of Cyber Law and Cyber Security.
- Identify how intruders escalate privileges and what steps can be taken to secure a system.
- Introduce and demonstrate hacking tools for penetration testing purposes only.

COURSE OUTCOMES (CO)

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

CO Number	CO Statement
CO1	Explain the basic concepts of Cyber Law & Ethics of Cyber Law.
CO2	Indicate the various Data Encryption Methodologies.
CO3	Enumerate about the Cyber Crime factors & Preventive Measures.
CO4	Demonstrate the use of Digital Signatures & Certificates .
CO5	Recognize and Detect Cyber Attacks.

MAPPING WITH PROGRAMME OUTCOMES

COs/ POs	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	H	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

L-Low M-Medium H-High

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 .

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 .

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

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 - Digital Millennium Copyright Act (DMCA) – Cyber Security Enhancement Act 2002. Proper and Ethical Disclosure: CERT's Current Process – Full Disclosure Policy – Organization for Internet Safety.

REFERENCE BOOKS

S.No.	Author Name	Title of the Book	Publisher
1.	Dr.B.Kirubashini., P.Kavitha	Cyber Law	Nandhini Pathippagam
2.	Suresh T.Viswanathan., N.Chanrababu Naidu	Indian Cyber Laws with Cyber Glossary	Bharath Law House PVT .LTD
3.	Dean Armstrong, Dan Hyde, Sam Thomas	Cyber Security Laws & Practice	Jordans Publishing Limited
4.	Dr.B.Kirubashini., P.Kavitha	Cyber Law	Nandhini Pathippagam
5.	Suresh T.Viswanathan., N.Chanrababu Naidu	Bharath Law House	

WEBSITE REFERENCES

- https://www.tutorialspoint.com › ... › Cyber Law - Quick Guide meity.gov.in/cyber-security
- gvpce.ac.in/syllabi/Mtech15-16/cyber-security/clsp kenes-exhibitions.com › Cyber Security Conference
- https://www.wileyindia.com/introduction-to-information-security-and-cyber-laws.htm
- https://www.wisdomjobs.com/e.../information-security-cyber-law-tutorial-2355.html
- https://cyber.laws.com/ethical-hacking-tutorials

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

SEMESTER I

Programme Code :	M.Sc IT	Programme Title	Master of Science (Information Technology)	
Course Code :	24P1ITCT04	Core 4: Design and Analysis of Algorithms	Batch	2024-2026
			Semester	I
Hrs/week	5		Credits	4

COURSE OBJECTIVES

To enable the students

- To write efficient algorithms for simple computational tasks and reasoning about the correctness of them.
- To Understand different design strategies and the use of data structures in improving algorithmic performance.
- To Understand the security concepts exposed to original research in network security
- To learn the Branch and Bound Techniques

COURSE OUTCOMES (CO)

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

CO Number	CO Statement
CO1	Analyze the asymptotic performance of algorithms
CO2	Differentiate different algorithmic approaches, techniques and methods
CO3	Apply design and analysis techniques for a given algorithm.
CO4	Apply optimization techniques for improving the efficiency of algorithms.
CO5	Find optimal solution by applying various methods

MAPPING WITH PROGRAMME OUTCOMES

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

L-Low M-Medium H-High

SYLLABUS

UNIT - I **(Hours : 12)**

Introduction : Algorithm definition, performance analysis, space complexity, time complexity, worst case – best case – average case complexity, asymptotic notation, sorting algorithms (insertion sort, heap sort) , sorting in linear time, searching algorithms, recursive algorithms (Tower of Hanoi , Permutations).

UNIT - II **(Hours : 12)**

Divide and conquer: General method - binary search, merge sort, Quick sort, Strassen's matrix multiplication .Greedy method- knapsack problem, job sequencing with deadlines. Minimum-cost spanning trees, Kruskal and Prim's algorithm, optimal storage on tapes, optimal merge patterns, Huffman coding.

UNIT - III **(Hours : 12)**

Dynamic programming- matrix chain multiplication, single source shortest paths, Dijkstra's algorithm, Bellman- ford algorithm , all pairs shortest path, longest common subsequence, string editing, 0/1 knapsack problem, Traveling salesperson problem.

UNIT - IV **(Hours : 12)**

Decrease and conquer: - DFS and BFS, Topological sorting, connected components. Backtracking: General method, 8 Queen's problem, Sum of subsets problem, graph coloring problem, Hamiltonian cycle, Knapsack problem.

UNIT - V **(Hours : 12)**

Branch and Bound Technique : FIFO, LCBB, LC search, The 15 puzzle, NP hard and NP Complete problems : Basic concepts – classes NP hard & NP complete – NP hard graph problems : Clique ecision Problem(CDP) – Chromatic Number Decision Problem(CNDP) – Directed Hamilton Cycle(DHC)

REFERENCE BOOKS

S. No	Author Name	Title of the Book	Publisher
1.	Ellis Horowitz, Sartaj Sahni & Sanguthevar Rajasekaran,	Computer Algorithms	Galgotia.
2.	T.H. Cormen, C.E. Leiserson,R.L. Rivest and C. Stein	Introduction to Algorithms	HI Learning private limited
3.	A. Aho, J. Hopcroft, & J. Ullman	The Design and Analysis of Computer Algorithms	Addison Wesley

WEBSITE REFERENCES

- https://www.tutorialspoint.com/design_and_analysis_of_algorithms/index.htm
- https://www.edx.org/course/algorithm-design-analysis-pennx-sd3x
- www. personal.kent.edu/~rmuhamma/Algorithms/algorithm.html
- https://www.coursera.org/courses?query=Algorithm%20design%20and%20analysis
- https://www.coursera.org/specializations/algorithms

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

SEMESTER I

Programme Code	**M.Sc IT**	**Programme Title**	**Master of Science (Information Technology)**	
Course Code	**24P1ITCP05**	**Core 5: Advanced Java Programming- Practical**	**Batch**	**2024-2026**
			Semester	**I**
Hrs/week	**4**		**Credits**	**4**

COURSE OBJECTIVES

To enable the students

- To gain knowledge in developing Java Programs for certain specified problems.
- To understand the basics of various applications using servlet communications.
- To understand the concepts of virtual functions and control structures

COURSE OUTCOMES (CO)

At the end of the practical session, students should be well-versed in

CO Number	**CO Statement**
CO1	Develop programs in Java to demonstrate Classes and objects
CO2	Use various types constructors and JFC.
CO3	Apply the concepts of virtual functions and control structures.
CO4	Design various applications using servlet communications.
CO5	Demonstrate Bean Development Environment and JSP Scripts.

MAPPING WITH PROGRAMME OUTCOMES

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

L-Low M-Medium H-High

SYLLABUS

1. Develop a Java program using control structures.
2. Develop a Java program which demonstrates Classes and objects
3. Develop a Java program to illustrate the concept of constructors.
4. Develop a Java program to demonstrate the usage of GUI concepts
5. Develop a Java program using JFC.
6. Develop a Java program for Sockets-Remote Method
7. Develop a Java program to indicate Servlet Communications.
8. Develop a Java JSP program using implicit objects.
9. Develop a Java JSP program using servlet communications.
10. Develop a Java program to demonstrate Bean Development Environments.

WEB REFERENCES

- https://www.linkedin.com/learning/advanced-java-programming
- https://www.quora.com/in/What-is-advanced-Java
- https://www.javatpoint.com/servlet-tutorial
- https://www.tutorialspoint.com/servlets/
- https://docs.oracle.com/javase/7/docs/technotes/guides/idl/corba.html

Means of Curriculum Delivery : Power point presentation, Lab Assignments, Observation

SEMESTER I

Programme Code :	**M.Sc IT**	**Programme Title**	**Master of Science (Information Technology)**	
Course Code :	**24P1ITCP06**	**Core 6 :Design and Analysis of Algorithms - Practical**	**Batch**	**2024-2026**
			Semester	**I**
Hrs/week	**4**		**Credits**	**3**

COURSE OBJECTIVES

To enable the students

- To gain knowledge about the teaching methodologies useful for the implementation and empirical evaluation of various algorithms
- To efficiently implement the solutions for specific problems.

COURSE OUTCOMES (CO)

At the end of the practical session, students should be well-versed in

CO Number	**CO Statement**
CO1	Identify the problem given and design the algorithm using various algorithm design techniques.
CO2	Implement various algorithms in a high level language
CO3	Analyze the performance of various algorithms.
CO4	Compare the performance of different algorithms for same problem.

MAPPING WITH PROGRAMME OUTCOMES

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

L-Low M-Medium H-High

SYLLABUS

1. Find Minimum Cost Spanning Tree of a given undirected graph using Kristal‟s algorithmObtain the Topological ordering of vertices in a given digraph
2. Implement 0/1 Knapsack problem using Dynamic Programming.
3. From a given vertex in a weighted connected graph, find shortest paths to other vertices

using Dijikstra‟s algorithm.

4. Find Minimum Cost Spanning Tree of a given undirected graph using Kristal‟s algorithm.
5. Print all the nodes reachable from a given starting node in a digraph using BFS method
6. Check whether a given graph is connected or not using DFS method.
7. Find Minimum Cost Spanning Tree of a given undirected graph using Prim‟s algorithm.
8. Implement N Queen's problem using Back Tracking.
9. Implement All Pairs Shortest Paths Problem using Floyd's algorithm

WEBSITE REFERENCES

- https://www.tutorialspoint.com/design_and_analysis_of_algorithms/index.htm
- https://www.edx.org/course/algorithm-design-analysis-pennx-sd3x
- www. personal.kent.edu/~rmuhamma/Algorithms/algorithm.html
- https://www.coursera.org/courses?query=Algorithm%20design%20and%20analysis
- https://www.coursera.org/specializations/algorithms

Means of Curriculum Delivery : Power point presentation, Lab Assignments, Observation

SEMESTER I

Programme Code :	M.Sc IT	Programme Title	Master of Science (Information Technology)	
Course Code :	24P1ITCP07	Core 7 : Open Source Tools Practical	Batch	2024-2026
			Semester	I
Hrs/week	2		Credits	2

COURSE OBJECTIVES

To enable the students

- To develop web applications using different programming languages.
- To apply the concepts like different controls and mathematical functions.

COURSE OUTCOMES (CO)

At the end of the practical session, students should be well-versed in

CO Number	CO Statement
CO1	Develop a program for different operations using PHP
CO2	Creating an application and finding out the biggest number
CO3	Creating an application using Getter and Setter methods.
CO4	Creating an application using POST method

MAPPING WITH PROGRAMME OUTCOMES

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

L-Low M-Medium H-High

SYLLABUS

1. Write a program to show data types in PHP.
2. Write a Program to use arithmetic operators in PHP.

3. Write a Program for finding the biggest number in an array without using an array function.
4. Write a Program for bubble sorting in PHP.
5. Write a Program to concatenate two strings character by Character.
6. Write a PHP Program using Getter and Setter.
7. Write a PHP Program using constructor and destructor.
8. Write a PHP Program using POST Method.

WEBSITE REFERENCES

- https://www.w3schools.com/PHP/ Language
- https://www.sourcecodester.com/PHP

Means of Curriculum Delivery : Power point presentation, Lab Assignments, Observation

SEMESTER II

SEMESTER II

Programme Code :	M.Sc IT	Programme Title	Master of Science (Information Technology)	
Course Code :	24P2ITCT08	Core 8: Distributed Computing and Linux	Batch	2024-2026
			Semester	II
Hrs/week	4		Credits	4

COURSE OBJECTIVES

To enable the students

- To provide an indepth knowledge about the concepts of Distributed computing and enable the students to write programs using Linux.
- To understand the concept of distributed process and communication.
- To understand the concept of Linux,file managemet operation and shell script.

COURSE OUTCOMES (CO)

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

CO Number	CO Statement
CO1	Discuss the concept of distributed system,types and its architecture
CO2	Describe the concept of distributed process and communication
CO3	Summarize the distributed synchronization and its algorithms
CO4	Use the Fault Tolerance and Client-Server Communication
CO5	Summarize the concepts of Linux, file management operation and shell script.

MAPPING WITH PROGRAMME OUTCOMES

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

L-Low M-Medium H-High

SYLLABUS

UNIT - I **(Hours:10)**

Introduction-Definition of a Distributed System- Goals- Types of Distributed systems – Architectures : Architectural styles – System Architectures -Architectures VS Middleware – Interceptors – Self management in distributed systems.

UNIT - II **(Hours: 10)**

Processes: Threads -Virtualization– Clients – Servers – code migration: Approaches to code migration – Migration and Local Resources – Migration in Heterogeneous Systems – Software agents – Communication: Fundamentals – RPC -Naming: naming Entities: names, identifiers and Addresses –Flat Naming – Structured naming

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

Synchronization: clock Synchronization - Physical Clock – Synchronization algorithms – use of Synchronized clocks – logical clocks - Mutual Exclusion – Election algorithms - Consistency and Replication – Data Centric Consistency Models – Client-centric consistency models - Replica Management

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

Fault Tolerance: Introduction to fault tolerance – Process resilience: design issues – Failure Masking and replication – Reliable Client-Server Communication: Point to Point Communication – RPC semantics in the presence of failures – Reliable group of Communication: basic Reliable – multicasting Schemes – Distributed Commit – Recovery.

UNIT - V **(Hours: 12)**

Linux Operating systems : Introduction – History of Linux– Differences between Linux and Other Operating System – User accounts – Accessing the linux system – Linux Commands – Linux File Structure: Linux file types – File structures – managing Files - Managing Directories – File and Directory operation. File Management Operation: File and Directory permissions – Jobs –Shell operations: Command Line – Standard Input/Output- Shell Scripts – Shell Variables - Arithmetic Shell Operations – Control Structures.

REFERENCE BOOKS

S. No	Author Name	Title of the Book	Publisher
1.	Andrew S.Tanenbaum and Marten Van Steen	Distributed Systems Principles and Paradigms	Prentice Hall India, New Delhi
2.	Pradeep K.Sinha	Distributed Operating Systems	Prentice Hall India, New Delhi
3.	George coulouris, Jean Dollimore and Tim Kindberg	Distributed Systems Concepts and Design	Pearson Education
4.	Richard Petersen	The Complete Reference – Linux	TMH

WEBSITE REFERENCES

- http://en.wikipedia.org/wiki/List_of_distributed_computing_projects
- http://www.indiastudychannel.com/resources/107761-Design-Issues-Distributed-Operating-System.aspx
- http://www.inf.uni-konstanz.de/dbis/teaching/ss06/os/ch14-wrongNumber.pdf
- https://www.cs.rutgers.edu/~pxk/rutgers/notes/content/ft.h
- Overview of Linux Distributions URL:http://distrowatch.com /dwres.php?resource=major

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

SEMESTER II

Programme Code	M.Sc IT	Programme Title	Master of Science (Information Technology)	
Course Code	24P2ITCT09	Core 9 : Python Programming	Batch	2024-2026
			Semester	II
Hrs/week	4		Credits	4

COURSE OBJECTIVE:

To enable the students

- To learn Syntax, semantics and create Functions in Python.
- To understand Regular expressions in constructing Data Structures and Build Web Services.
- To understand the Data Structures using Python
- To understand the concepts of Regular Expressions and Object-Oriented programming as used in Python

COURSE OUTCOMES (CO)

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

CO Number	CO Statement
CO1	Exposed to Python syntax and semantics and be fluent in the use Python flow control and functions.
CO2	Create and run Python Programs using Lists, Dictionaries and handle File Systems.
CO3	Explain the concepts of Regular Expressions and Object-Oriented programming as used in Python.
CO4	Build Data Structures using Python.
CO5	Create programming projects from scratch using in-demand skill and technologies

MAPPING WITH PROGRAMME OUTCOMES

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

L-Low M-Medium H-High

SYLLABUS

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

Terminology: Interpreter and compiler, Writing a program- Variables, expressions and statements: Values and types-Variables – Statements – Expressions. Conditional execution-Functions: Built-in functions-Type conversion functions-Random numbers-Math functions-Adding new functions-Dentitions and uses.

Unit – II **(Hours:12)**

Iteration-The while statement-Infinite loops and break, Finishing iterations with continue-Definite loops using for-Loop patterns-Strings-String comparison-string methods-Parsing strings- Format operator- Files- Opening files-Text files and lines-Reading files-Searching - Using try, except, and open and writing files-Lists- Traversing a list, List operations, List slices, List methods-Deleting elements-Lists and functions- Lists and strings-Parsing lines-Objects and values**.**

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-MyTime-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:10)**

Networked programs: Hypertext Transport Protocol – HTTP, The World's Simplest Web Browser, Retrieving an image over HTTP, Retrieving web pages with url lib, Parsing HTML and scraping the web, Parsing HTML using Regular Expressions, Parsing HTML using Beautiful Soup, Reading binary files using urllib,eXtensible Markup Language – XML, Parsing XML, Looping through nodes, JavaScript Object Notation – JSON, Parsing JSON, Application Programming Interfaces (API).

REFERENCE BOOKS

S.No	Authors	Title	Publishers
1	Charles Severance	Python for Informatics	CreateSpace Independent Publishing Platform, First Edition
2	Peter Wentworth, Jeffrey Elkner, Allen B. Downey and Chris Meyers	How to Think Like a Computer Scientist: Learning with Python	Open Book Project, Second Edition
3	Mark Lutz	Learning Python	O'Reilly Media, Fifth Edition
4	Wesley Chun	Core Python Applications Programming	Prentice Hall India, New Delhi, Third Edition
5.	Alex Martelli	Python in a Nutshell	O'Reilly Media, Second Edition

WEBSITE REFERENCES:

- https://pythonprogramming.net
- https://www.sanfoundry.com/python-problems-solutions
- https://www.tutorialspoint.com/python/python_linked_lists.htm
- http://interactivepython.org/runestone/static/pythonds/BasicDS/toctree.html
- https://pythonprogramminglanguage.com

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

SEMESTER II

Programme Code :	**M.Sc IT**	**Programme Title**	**Master of Science (Information Technology)**	
Course Code :	**24P2ITCT10**	**Core 10: Object Oriented Analysis And Design**	**Batch**	**2024-2026**
			Semester	**II**
Hrs/week	**4**		**Credits**	**3**

COURSE OBJECTIVES

To enable the students

- To specify, analyze and design the use case driven requirements for a particular system to model the event driven state of object and transform them into implementation specific layouts.
- To understands the UML programming by exploiting the objects in the real world.

COURSE OUTCOMES (CO)

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

CO Number	**CO Statement**
CO1	Analyze and design the use case driven requirements for a particular system
CO2	Analyze and identify the subsystems, various components and collaborate them interchangeably
CO3	Recollect about the basic functionality of object and to know how objects work with different methodologies.
CO4	To analyse the problem and tends to refine the problem into concepts.
CO5	Describe the UML programming by exploiting the objects in the real world.

MAPPING WITH PROGRAMME OUTCOMES

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

L-Low M-Medium H-High

SYLLABUS

UNIT I **(Hours:12)**

Object Basics: Introduction – An Object - Oriented Philosophy – Objects – Attributes – Object Behavior And Methods – Objects Respond To Messages – Encapsulation And Information Hiding – Class Hierarchy – Polymorphism – Object Relationships And Associations – Aggregations And Object Containment – Meta-Classes – Object- Oriented System Development Life Cycle.

UNIT II **(Hours: 10)**

Object-Oriented Methodologies: Rumbaugh Object Modeling Technique – The Booch Methodology – The Jacobson Methodologies – Patterns – Frameworks – The Unified Approach.

UNIT III **(Hours: 10)**

Object-Oriented Analysis: Business Object Analysis – Use-Case Driven Object-Oriented Analysis – Business Process Modeling – Use-Case Model – Object Analysis – Noun Phrase Approach –Common Class Pattern Approach – Use-Case Driven Approach – Classes, Responsibilities And Collaborators.

UNIT IV **(Hours: 10)**

Object-Oriented Design: Object-oriented Design Process – Object-Oriented Design Axioms – Corollaries –Design Patterns - designing classes – case study.

UNIT V **(Hours: 10)**

UML and Programming: Introduction – Static and Dynamic Models – Introduction to the Unified Modelling Language – UML Diagrams – UML Class Diagram – Use Case Diagram – UML Dynamic Modelling – Case study to inventory, sales and banking.

REFERENCE BOOKS

S. No	Author Name	Title of the Book	Publisher
1.	Ali Bahrami	Object Oriented Systems Development	Irwin-McGraw Hill
2.	Gredy Booch	Object Oriented Analysis and Design With Applications	Addition Wesley
3.	Martin Fowler	UML Distilled	PHI Education
4.	Rumbaugh, James, Jacobson, Ivar, and Booch, Grady	The Unified Modeling Language Reference Manual	Addison Wesley

WEBSITE REFERENCES

- https://en.wikipedia.org/wiki/Object-oriented_analysis_and_design
- https://www.tutorialspoint.com/object_oriented_analysis_design/
- https://en.wikipedia.org/wiki/Object-oriented_analysis_and_design
- https://airbrake.io/blog/design-patterns/object-oriented-analysis-and-design
- https://medium.com/.../object-oriented-analysis-and-design

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

SEMESTER II

Programme Code :	**M.Sc IT**	**Programme Title**	**Master of Science (Information Technology)**	
Course Code :	**24P2ITCT11**	**Core 11: Big Data Analytics**	**Batch**	**2024-2026**
			Semester	**II**
Hrs/week	**4**		**Credits**	**4**

COURSE OBJECTIVES

To enable the students

- To provide the knowledge about the Big Data Fundamentals, including the characteristics of Big Data, the sources Big Data (such as social media, sensor data, geospatial data etc),
- To enable the studetns to understand the challenges imposed around information management, data analytics, privacy and security, as well as platforms and architectures
- Understand the the concepts of HDFS and MapReduce framework

COURSE OUTCOMES (CO)

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

CO Number	**CO Statement**
CO1	Explain the the concepts of HDFS and MapReduce framework
CO2	Explain the Hadoop 2.x Architecture
CO3	Implement HBase and MapReduce Integration
CO4	To analyse the problem and tends to refine the problem into concepts. Implement best Practices for Hadoop Development
CO5	Work on a Real Life Project on Big Data Analytics

MAPPING WITH PROGRAMME OUTCOMES

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

L-Low M-Medium H-High

SYLLABUS

UNIT I **(Hours:12)**

INTRODUCTION TO BIG DATA: Introduction to BigData Platform –Challenges of Conventional Systems - Intelligent data analysis –Nature of Data - Analytic Processes and Tools - Analysis vs Reporting - Modern Data Analytic Tools - Statistical Concepts: Sampling Distributions - Re - Sampling - Statistical Inference - Prediction Error.

UNIT II **(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 –Real time Analytics Platform(RTAP) Applications

UNIT III **(Hours: 13)**

HADOOP: History of Hadoop-The Hadoop Distributed File System –Components of Hadoop-Analyzing the Data with Hadoop-Scaling Out-Hadoop Streaming-Design of HDFS-Java interfaces to HDFS-Basics-Developing a Map Reduce Application-How Map Reduce Works-Anatomy of a Map Reduce Job run-Failures-Job Scheduling-Shuffle and Sort –Task execution -Map Reduce Types and Formats

UNIT IV **(Hours: 11)**

HADOOP ENVIRONMENT: Setting up a Hadoop Cluster -Cluster specification -Cluster Setup and Installation -Hadoop Configuration-Security in Hadoop -Administering Hadoop –HDFS -Monitoring-Maintenance-Hadoop benchmarks-Hadoop in the cloud.

UNIT V **(Hours: 12)**

FRAMEWORKS: Applications on Big Data Using Pig and Hive –Data processing operators in Pig –Hive services –HiveQL –Querying Data in Hive -fundamentals of HBase and ZooKeeper -IBM InfoSphere. Visualizations -Visual data analysis techniques, interaction techniques.

REFERENCE BOOKS

S. No	Author Name	Title of the Book	Publisher
1.	Tom White	Hadoop: The Definitive Guid	O'reilly Media
2.	Anand Rajaraman and Jeffrey David Ullman	Mining of Massive Datasets	Cambridge University Press
3.	Bill Franks,	Taming the Big Data Tidal Wave	John Wiley & sons
4.	Michael Berthold, David J. Hand,	Intelligent Data Analysis	Springer

WEBSITE REFERENCES

- https://www.sas.com › SAS Insights › Analytics Insights
- https://analyticstraining.com › Big Data Analytics
- https://www.qubole.com/big-data-analytics
- https://en.wikipedia.org/wiki/Big_data
- https://www.edx.org/course/big-data-analytics-adelaidex-analyticsx

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

SEMESTER II

Programme Code :	**M.Sc IT**	**Programme Title**	**Master of Science (Information Technology)**	
Course Code :	24P2ITCP12	Core 12:Linux - Practical	Batch	2024-2026
			Semester	II
Hrs/week	4		Credits	3

COURSE OBJECTIVES

To enable the students

- To develop the applications using Linux Programming.
- To apply the concepts of shell script and linux programming

COURSE OUTCOMES (CO)

At the end of the practical session, students should be well-versed in

CO Number	CO Statement
CO1	Learn to know the working of RMI and RPC
CO2	Know the concept working in syncronization
CO3	How to make, remove, rename, copy and move files and directories
CO4	Learn to identify and change the permissions of files and directories and what the consequences of these are.
CO5	Learn to write shell scripting.

MAPPING WITH PROGRAMME OUTCOMES

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

L-Low M-Medium H-High

SYLLABUS

Distributed System:

1. To study Client Server based program using RMI
2. To study Client Server based program using RPC.
3. To study Implementation of Election algorithm.
4. To study Implementation of Mutual Exclusion algorithms.

Linux Programming :

5. Study of General Purpose Utility Commands.
6. Study of File System Navigation Commands Text Processing Tools.
7. Write shell script to perform integer arithmetic operations
8. Write a Shell script that displays list of all the files in the current directory to which the user has read, write and execute permissions.
9. Write a shell script that computes the gross salary of a employee according to the following
   1) if basic salary is <1500 then HRA 10% of the basic and DA =90% of the basic
   2) if basic salary is >=1500 then HRA 500 and DA =98% of the basic
10. Write a shell script to search an element in the list

WEBSITE REFERENCES

- https://www.tutorialspoint.com/java_rmi/java_rmi_application.htm
- hhttp://mrbool.com/how-to-create-rmi-client-and-server-to-invoke-remove-method-of-rmi-server-in-java/28320
- http://www.learntosolveit.com/java/MutualExclusion.html
- https://opensource.com/resources/linux

Means of Curriculum Delivery : Power point presentation, Lab Assignments, Observation.

SEMESTER II

Programme Code :	**M.Sc IT**	**Programme Title**	**Master of Science (Information Technology)**	
Course Code	**24P2ITCP13**	**Core 13 :Python Programming-Practical**	**Batch**	**2024-2026**
			Semester	**II**
Hrs/week	**4**		**Credits**	**3**

COURSE OBJECTIVES

To enable the students

- To write, test, and debug simple Python programs.
- To develop the applications using Python programming language.

COURSE OUTCOMES:

At the end of the practical session, students should be well-versed in

CO Number	**CO Statement**
CO1	Develop proficiency in creating applications,testing and debugging of code written in Python using the Python Programming Language.
CO2	Understand the various data structures available in Python programming language and apply them in solving computational problems.
CO3	Perform text filtering with regular expressions in Python
CO4	Draw various kinds of plots using Python Lab

MAPPING WITH PROGRAMME OUTCOMES

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

L-Low M-Medium H-High

SYLLABUS

1. Develop programs to understand the control structures of python
2. Develop programs to learn different types of structures (list, dictionary, tuples) in python
3. Develop programs to learn concept of functions scoping, recursion and list mutability.
4. Develop programs to understand working of exception handling and assertions.

5. Develop programs for data structure algorithms using python searching and sorting
6. Develop programs to learn regular expressions using python.
7. Learn to plot different types of graphs using PyPlot.
8. Implement classical ciphers using python

WEB REFERENCES

- https://www.w3resource.com/python-exercises
- http://www.introtopython.org/
- https://inventwithpython.com/hacking/chapters

Means of Curriculum Delivery : Power point presentation, Lab Assignments, Observation.

SEMESTER II

Programme Code	M.Sc IT	Programme Title	Master of Science (Information Technology)	
Course Code	24P2ITCP14	Core 14: MATLAB Practical	Batch	2024-2026
Hrs/week	2 Hours		Semester	II
			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

L-Low M-Medium H-High

SYLLABUS

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.

WEBSITE REFERENCE

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

Means of Curriculum Delivery: Power point presentation, Lab Assignments, Observation.

SEMESTER II

Programme Code :	M.Sc IT	Programme Title	Master of Science (Information Technology)	
Course Code :	24P2ITET1A	Elective 1 : Grid Computing	Batch	2024-2026
			Semester	II
Hrs/week	4		Credits	4

COURSE OBJECTIVES

To enable the students

- To be familiar with the fundamental components of Grid environments, such as authentication, authorization, resource access, and resource discovery.
- To design and implement Grid computing applications using Globus or similar toolkits.
- To justify the applicability, or non-applicability, of Grid technologies for a specific application.
- To understand where the grid computing could be effectively utilized by illustrations of applications of grid computing.

COURSE OUTCOMES (CO)

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

CO Number	CO Statement
CO1	Explain various Grid Standards, Principles, Approaches, and Methods in Grid Environment.
CO2	Know the application, History, learning and Motivation theories in assessing the Economic Strategy and Satisfaction.
CO3	Describe the grounding in the architecture of the Grid, and exposure to various implementations of the infrastructure.
CO4	Evaluate the Grid Service Taxonomy, functionalities in Grid Service Architecture.
CO5	Explain the various applications of grid computing.

MAPPING WITH PROGRAMME OUTCOMES

COs/ POs	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	H	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

L-Low M-Medium H-High

SYLLABUS

UNIT - I **(Hours : 10)**

Introduction: Grid Computing & Key Issues –Applications –Other Approaches –Grid Computing Standards –Pragmatic Course of Investigation Grid Computing Software Interface-Grid Computing Infrastructure Development.

UNIT - II **(Hours : 10)**

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

UNIT – III **(Hours : 10)**

Components of Grid Computing Systems and Architectures: Basic Constituent Elements-A Functional View –A Physical View –Service View Grid Environment-Grid Security Infrastructure-Delegation-Higher Level Authorization Tools.

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

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

UNIT - V **(Hours : 10)**

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

REFERENCE BOOKS

S. No.	Author Name	Title of the Book	Publisher
1.	Daniel Minoli	A Networking Approach to Grid Computing	Wiley Publication
2.	Ahmar Abbas	Grid Computing –A Practical Guide to Technology and Applications	Charles River Media Publication.
3.	Barry Wilkinson	Grid Computing Techniques and Applications	CRC Press

WEBSITE REFERENCES

- https://www.techopedia.com/definition/87/grid-computing
- https://computer.howstuffworks.com › ... › Computer Hardware › Networking
- https://searchdatacenter.techtarget.com/definition/grid-computing
- https://azure.microsoft.com/en-in/overview/what-is-grid-computing/
- https://techterms.com/definition/grid_computing

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

SEMESTER II

Programme Code	M.Sc IT	Programme Title	Master of Science (Information Technology)	
Course Code	24P2ITET1B	Elective 1 : Introduction to Robotics	Batch	2024-2026
			Semester	II
Hrs/week	4		Credits	4

COURSE OBJECTIVES

To enable the students

- To learn the basic concepts of Robots and the concepts of Kinematics of Robotics
- To learn the concepts of Motions, velocities and dynamic analysis of force
- To understand the concepts of Motion planning and Trajectory Planning
- To understand the concepts Actuators and sensors.

COURSE OUTCOMES (CO)

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

CO Number	CO Statement
CO1	Explain the basic concepts of Robots.
CO2	Describe the working kinematics of Robots
CO3	Explain the concept of motion, velocities and dynamic forces
CO4	Realise the Motion and Trajectory planning
CO5	Explain the different Actuators and Sensors.

MAPPING WITH PROGRAMME OUTCOMES

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

L-Low M-Medium H-High

SYLLABUS

UNIT – I **(Hours : 10)**

Fundamentals: What is a Robot? Classification of Robots. What is Robotics? History of Robotics. Advantages and Disadvantages of Robots. Robot Components. Robot Degrees of Freedom. Robot Joints. Robot Coordinates. Robot Reference Frames. Programming Modes. Robot Characteristics. Robot Workspace. Robot Languages. Robot Applications. Other Robots and Applications. Social Issues.

Unit – II **(Hours : 10)**

Robot Kinematics:Position Analysis: Robots as Mechanisms. Matrix Representation. Homogeneous Transformation Matrices. Representation of Transformations. Inverse of Transformation Matrices. Forward and Inverse Kinematics of Robots.

Unit – III **(Hours : 10)**

Differential Motions and Velocities:Differential Relationships. Jacobian. Differential Motions of a Frame. Interpretation of the Differential Change. Differential Changes Between Frames. **Dynamic Analysis and Forces:**Lagrangian Mechanics: A Short Overview. Effective Moments of Inertia. Dynamic Equations for Multiple-Degree-of-Freedom Robots. Static Force Analysis of Robots. Transformation of Forces and Moments Between Coordinate Frames

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

Trajectory Planning: Path vs. Trajectory. Joint-Space vs. Cartesian-Space Descriptions. Basics of Trajectory Planning. Joint-Space Trajectory Planning. Cartesian-Space Trajectories. Continuous Trajectory Recording.

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

Actuators: Characteristics of Actuating Systems. Comparison of Actuating Systems. Hydraulic Devices. Pneumatic Devices. Electric Motors. Microprocessor Control of Electric Motors. Magnetostrictive Actuators. Shape-Memory Type Metals. Speed Reduction

Sensors: Sensor Characteristics. Position Sensors. Velocity Sensors. Acceleration Sensors. Force and Pressure Sensors. Torque Sensors. Microswitches. Light and Infrared Sensors. Touch and Tactile Sensors. Proximity Sensors. Range-finders. Sniff Sensors. Vision Systems. Voice Recognition Devices. Voice Synthesizers. Remote Center Compliance (RCC) Device

REFERENCE BOOKS

S.NO	Author Name	Title of the Book	Publisher
1	Saeed B. Niku	Introduction to Robotics: Analysis, Systems, Applications	Hoboken,N.J Wiley
2	Ghosal, A.	Robotics:Fundamental Concepts and Analysis	Oxford University Press
3.	Doughales R. Halconnjr.	An Introduction to Robotics	-

WEBSITE REFERENCES

- http://engineering.nyu.edu/mechatronics/smart/pdf/Intro2Robotics.pdf
- https://www.ohio.edu/mechanical-faculty/williams/html/PDF/IntroRob.pdf
- http://courses.csail.mit.edu/6.141/spring2014/pub/labs/lab7/docs/Arm-Assembly-Instructions.pdf

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

SEMESTER II

Programme Code	M.Sc IT	Programme Title	Master of Science (Information Technology)	
Course Code	24P2ITET1C	Elective 1 : Bioinformatics	Batch	2024-2026
			Semester	II
Hrs/week	4		Credits	4

COURSE OBJECTIVES:

To enable the students

- To understand the basic concepts in molecular biology and genetics.
- To understand the various methods of phylogenetic tree construction
- To understand the various techniques of proteomics.
- To understand the structure and functions of the genomes.
- To know the application areas of bioinformatics.

COURSE OUTCOMES (CO)

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

CO Number	CO Statement
CO1	Describes about the concepts of molecular biology.
CO2	Interpret the characteristics of phylogenetic methods
CO3	Explain the pair wise sequence alignment methods.
CO4	Explain the protein synthesis in eukariotic cells.
CO5	Describe the various bioinformatics applications.

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	M	M	H	H
CO2	L	H	H	H	H	M	M	M	M	M	H	H
CO3	L	H	H	H	H	M	M	M	M	M	H	H
CO4	L	H	H	H	H	M	M	M	M	M	H	H
CO5	L	H	H	H	H	M	M	M	M	M	H	H

L-Low M-Medium H-High

SYLLABUS

UNIT I **(Hours:10)**

Molecular Biology, Gene Structure and Information Content, Molecular Biology Tools, Genomic Information Content, Data Searches and Pairwise Alignments, Gaps, Scoring Matrices, Needleman and Wunsch Algorithm, Global and Local Alignments, Database Searches. Self Study: Scoring Matrices

UNIT II **(Hours:10)**

Patterns of Substitution Within Genes, Estimating Substitution Numbers, Molecular Clocks, Molecular Phylogenetics, Phylogenetic Trees, Distance Matrix Methods. Self Study: Distance Matrix Methods

UNIT III **(Hours:10)**

Character-Based Methods Of Phylogenetics, Parsimony, Ancestral Sequences, Searches, Consensus Trees, Tree Confidence, Genomics, Prokaryotic Gene Structure, Gene Density,Eukariotic Genomes, Gene Expression. Self Study: Gene Expression.

UNIT IV **(Hours:10)**

Protein and RNA Structure Prediction, Polypeptic Composition, Secondary and Tertiary Structure, Algorithms For Modeling Protein Folding, Structure Prediction. Self Study: Structure Prediction.

UNIT V **(Hours:10)**

Proteomics, Protein Classification, Experimental Techniques, Ligand Screening, Post-Translational Modification Prediction. Self Study: Protein Classification.Bioinformatics Applications – Agricultural – Transgenic Plants and Animals, Pharmaceutical –Drug design and Medical – SNP, Genetic Disorders, Gene therapy.

REFERENCE BOOKS

S. No	Author Name	Title of the Book	Publisher
1.	D. E. Krane and M. L. Raymer	Fundamental Concepts of Bioinformatics	Pearson Education
2.	T. K. Attwood and D. J. Parry-Smith	Introduction to Bioinformatics	Pearson Education
3.	J. H. Zar	Biostatistical Analysis	Pearson Education

WEB REFERENCES

- www.Bioinformatics.org
- www.bioinfo.mbb.yale.edu/mbb452a/intro/
- www.biology.ucsd.edu/others/dsmith/Bioinformatics.html

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

SEMESTER II

Programme Code	M.Sc IT	Programme Title	Master of Science (Information Technology)	
Course Code	24P2ITET1D	Elective 1 : Wireless Communication	Batch	2024-2026
Hrs/week	4		Semester	II
			Credits	4

COURSE OBJECTIVES

To enable the Students

- To understand the basics of wireless voice and data communication technologies.
- To study the working principles of wireless LAN and its standards .
- To build working knowledge on various telephone and satellite networks.
- To build knowledge on various Mobile Computing algorithms.

COURSE OUTCOMES (CO)

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

CO Number	CO Statement
CO1	Recognize various bandwidth Coherences and various Channels.
CO2	Explain the Cellular concepts and Frequency coverage calculations.
CO3	Elucidate the Wireless computing Algorithms and Technologies.
CO4	Identify two core networks associated with 3G Cellular networks
CO5	Compare the data transfer rates with those over Wireless LAN

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	M	M	H	H
CO2	L	H	H	H	H	M	M	M	M	M	H	H
CO3	L	H	H	H	H	M	M	M	M	M	H	H
CO4	L	H	H	H	H	M	M	M	M	M	H	H
CO5	L	H	H	H	H	M	M	M	M	M	H	H

L-Low M-Medium H-High

SYLLABUS

UNIT - I **(Hours:10)**

Large scale path loss – Path loss models: Free Space and Two-Ray models -Link Budget design– Small scale fading- Parameters of mobile multipath channels – Time dispersion parameters-Coherence bandwidth – Doppler spread & Coherence time, Fading due to Multipath time delay spread .

UNIT - II **(Hours:10)**

Multiple Access techniques - FDMA, TDMA, CDMA – Capacity calculations–Cellular concept-Frequency reuse - channel assignment- hand off- interference & system capacity-trunking & grade of service – Coverage and capacity improvement.

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

Structure of a wireless communication link, Principles of Offset-QPSK, p/4-DQPSK, Minimum Shift Keying, Gaussian Minimum Shift Keying, Error performance in fading channels, OFDM principle – Cyclic prefix, Windowing, PAPR.

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

Equalisation – Adaptive equalization, Linear and Non-Linear equalization, Zero forcing an LMS Algorithms. Diversity – Micro and Macro diversity, Diversity combining techniques, Error probability in fading channels with diversity reception, Rake receiver.

UNIT - V **(Hours:10)**

MIMO systems – spatial multiplexing - System model -Pre-coding - Beam forming - transmitter diversity, receiver diversity- Channel state information-capacity in fading and non-fading channels.

REFERENCE BOOKS

S. No.	Author Name	Title of the Book	Publisher
1.	Rappaport,T.S.	Wireless Communications	Pearson Education
2.	Andreas.F. Molisch	Wireless Communications	John Wiley – India
3.	David Tse, Pramod Viswanath	Fundamentals of Wireless Communication	Cambridge University Press
4.	Upena Dalal	Wireless Communication	Oxford University Press
5.	Van Nee, R. and Ramji Prasad	OFDM for Wireless Multimedia Communications	Artech House

WEBSITE REFERENCES

- https://www.engineersgarage.com/articles/wireless_communication
- https://www.tutorialspoint.com › ... › Wireless Communication – Overview
- https://www.edgefx.in/different-types-wireless-communication-technologies/
- https://www.techopedia.com/definition/10062/wireless-communications
- https://www.electronicshub.org › General

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

SEMESTER II

Programme Code	M.Sc IT	Programme Title	Master of Science (Information Technology)	
Course Code	24P2ITET1E	Elective 1 : Advanced Database Technology	Batch	2024-2026
Hrs/week	4		Semester	II
			Credits	4

COURSE OBJECTIVES

To enable the Students

- To understand the concepts of DBMS.
- To have knowledge on DBMS.
- To develop the skills of Embedded and Dynamic SQL.

COURSE OUTCOMES

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

CO Number	CO Statement
CO1	Define the concept of Database and Database Design
CO2	Use the Commands and understand table
CO3	Use SQL query structure and modify the table
CO4	Describe about function, grouping and PL/SQL
CO5	Define the concept of Embedded SQL and PL/SQL

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	M	M	H	H
CO2	L	H	H	H	H	M	M	M	M	M	H	H
CO3	L	H	H	H	H	M	M	M	M	M	H	H
CO4	L	H	H	H	H	M	M	M	M	M	H	H
CO5	L	H	H	H	H	M	M	M	M	M	H	H

L-Low M-Medium H-High

SYLLABUS

UNIT I **(Hours : 10)**

RELATIONAL MODEL: ER Model - Normalization - Query Processing - Query Optimization - Transaction Processing - Concurrency Control - Recovery - Database Tuning.

UNIT II **(Hours : 10)**

DISTRIBUTED DATABASES: Parallel Databases – Inter and Intra Query Parallelism – Distributed Database Features – Distributed Database Architecture – Fragmentation – Distributed Query Processing – Distributed Transactions Processing – Concurrency Control – Recovery – Commit Protocols.

UNIT III **(Hours : 10)**

OBJECT ORIENTED DATABASES : Introduction to Object Oriented Data Bases - Approaches - Modeling and Design - Persistence - Query Languages - Transaction - Concurrency - Multi Version Locks- Recovery – Postgres-Jasmine-Gemstone-ODMG Model.

UNIT IV **(Hours : 10)**

EMERGING SYSTEMS: Enhanced Data Models - Client/Server Model - Data Warehousing and Data Mining - Web Databases – Mobile Databases- XML and Web Databases.

UNIT V **(Hours : 10)**

CURRENT ISSUES: Rules - Knowledge Bases - Active and Deductive Databases - Multimedia Databases– Multimedia Data Structures – Multimedia Query languages - Spatial Databases.

REFERENCE BOOKS

S. No.	Author Name	Title of the Book	Publisher
1.	R. Elmasri, S.B. Navathe,	Fundamentals of Database Systems	Pearson Education
2.	Abraham Silberschatz, Henry F. Korth, S. Sudharshan	Database System Concepts	Tata McGraw Hill
3.	C.J.Date, A.Kannan, S.Swamynathan	An Introduction to Database Systems	Pearson Education

WEBSITE REFERENCES

- https://en.wikipedia.org/wiki/RDBMS
- https://www.tutorialspoint.com/DBMS
- https://www.geeksforgeeks.org/

Means of Curriculum Delivery : Power point presentation, Lab Assignments, Observation, Google Classroom

SEMESTER III

SEMESTER III

Programme Code	**M.Sc IT**	**Programme Title**	**Master of Science (Information Technology)**	
Course Code	**24P3ITCT15**	**Core 15: Web Data Mining**	**Batch**	**2024-2026**
			Semester	**III**
Hours/week	**4**		**Credits**	**4**

COURSE OBJECTIVES

To enable the students to

- Understand the difference between web content mining, web structure mining and web usage mining and their applications.
- Understand the web content mining in accordance with machine learning concepts.
- Understand to extract the structured data from some fixed templates and extracting enables us to separate the particular data from multiple sources.
- Understand the automatic discovery of meaningful patterns and relationships from the large collection of semi-structured data.

COURSE OUTCOMES (CO)

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

CO Number	**CO Statement**
CO1	Classify the difference between web content mining, web structure mining and web usage mining and their applications.
CO2	Summarize the web content mining in accordance with machine learning concepts.
CO3	Communicate the diverse concepts of object ranking, group detection, collective classification, link prediction and sub graph discovery to build various models in linked data.
CO4	Focusing on extracting the structured data from some fixed templates and extracting enables us to separate the particular data from multiple sources.
CO5	Explain the automatic discovery of meaningful patterns and relationships from the large collection of semi-structured data.

MAPPING WITH PROGRAMME OUTCOMES

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

L-Low M-Medium H-High

SYLLABUS

UNIT I **(Hours : 10)**

Web Mining: Introduction – Theoretical background – Algorithms and techniques – Association rule mining – Sequential Pattern Mining – Information retrieval and Web search – Information retrieval Models – Relevance Feedback – Text and Web page Pre-processing – Inverted Index –Latent Semantic Indexing – Web Search – Meta – Search – Web Spamming.

UNIT - II **(Hours : 10)**

Web Content Mining: Supervised Learning –Decision tree -Naïve Bayesian Text Classification-Support Vector Machines -Ensemble of Classifiers. Unsupervised Learning -K-means Clustering -Hierarchical Clustering – Partially Supervised Learning –Markov Models -Probability-Based Clustering – Evaluating Classification and Clustering – Vector Space Model – Latent semantic Indexing – Automatic Topic Extraction -Opinion Mining and Sentiment Analysis -Document Sentiment Classification.

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

Web Link Mining – Hyperlink based Ranking – Social Networks Analysis – Co-Citation and Bibliographic Coupling – Page Rank – Authorities and Hubs – Link-Based Similarity Search – Enhanced Techniques for Page Ranking – Community Discovery**.**

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

Structured Data Extraction: Wrapper Generation – Preliminaries – Wrapper Induction – Instance – BasedWrapper Learning – Automatic Wrapper Generation: String Matching and Tree Matching – Multiple Alignment – Building DOM Trees – Extraction Based on a Single List Page and Multiple pages.

UNIT - V **(Hours : 10)**

Web Usage Mining – Click stream Analysis – Web Server Log Files – Data Collection and Pre-Processing – Cleaning and Filtering – Data Modeling for Web Usage Mining – The BIRCH Clustering

Algorithm –Affinity Analysis and the A Priori Algorithm –Binning – Discovery and Analysis of Web Usage Patterns – Modeling user interests – Probabilistic Latent Semantic Analysis – Latent Dirichlet Allocation Model.

REFERENCE BOOKS

S.No.	Author Name	Title of the Book	Publisher
1.	Bing Liu	Web Data Mining - Exploring Hyperlinks, Contents and Usage Data	Springer
2.	Guandong Xu, Yanchun Zhang, Lin Li	Web Mining and Social Networking: Techniques and Applications Springer, First Edition	Springer
3.	Zdravko Markov, Danie lT. Larose,	Data Mining the Web: Uncovering Patterns in Web Content, Structure, and Usage	John Wiley & Sons, Inc.
4.	Soumen Chakrabarti	Mining the Web: Discovering Knowledge from Hypertext Data	Morgan Kaufmann Edition

WEBSITE REFERENCES

- https://www.tutorialride.com/data-mining/web-mining.html
- https://www.tutorialspoint.com › data mining › data mining
- https://www.cs.uic.edu/~liub/WebMining.html

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

SEMESTER III

Programme Code	M.Sc IT	Programme Title	Master of Science (Information Technology)	
Course Code	24P3ITCT16	Core 16: Advanced Computer Networks	Batch	2024-2026
			Semester	III
Hours/week	4		Credits	4

COURSE OBJECTIVES

To enable the students

- To learn the basic computer network technology.
- To enhance the knowledge about digital transmission methods.
- To Identify the different types of network topologies.
- To learn different protocols used for transmission of data in various layers.
- To learn about user networks interfaces and protocols of ATM and its operations and maintenance.

COURSE OUTCOMES (CO)

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

CO Number	CO Statement
CO1	Explain the Data Communications System and its components.
CO2	Describe routing and congestion in network layer with routing algorithms
CO3	master the terminology and concepts of the OSI reference models and TCP/IP
CO4	Illustrate applications of Computer Network capabilities, selection and usage for various sectors of user community.
CO5	Explain the concepts of ATM and its Methods.

MAPPING WITH PROGRAMME OUTCOMES

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

L-Low M-Medium H-High

SYLLABUS

UNIT I **(Hours: 10)**

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

UNIT II **(Hours: 12)**

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

UNIT III **(Hours: 10)**

Networking Protocal and OSI Model : Introduction – Protocals in computer communication – the OSI Model – OSI Layer Functions. TCP/IP : Introduction-TCP/IP Basics - why IP Addresses? - Local addresses-TCP/IP Examples-The concepts of IP Adresses-ARP.

UNIT IV **(Hours: 10)**

TCP/IP PART II-(TCP,UDP) - TCP/IP PART III(DNS,Email,FTP,TFTP)

UNIT V **(Hours: 10)**

Overview of ATM : Introduction – What is ATM ? Genesis of ATM – Basic Principles of ATM – TCP/IP Part IV(WWW,HTTP,TELNET).

Reference Books:

S. No	Author Name	Title of the Book	Publisher
1.	Achyut Godbole	Data Communication And Networks	Tata MaGraw-Hill
2.	Sumit Kasera & Pankaj Seth	ATM Networks concetps and protocols	Tata MaGraw-Hill
3.	Uyless Black	Computer Networks - Protocols, Standards, and Interfaces	Prentice-Hall International

WEB REFERENCES

- https://www.tutorialspoint.com>data_communication
- https://what-when-how.com>data - communication
- https://www.courseera.org>learn>data communication
- https:// www.researchgate.net > publication
- https://www.ecomputers.com

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

SEMESTER III

Programme Code	M.Sc IT	Programme Title	Master of Science (Information Technology)	
Course Code	24P3ITCT17	Core 17: Internet of Things	Batch	2024-2026
			Semester	III
Hours/week	4		Credits	4

COURSE OBJECTIVES

To enable the students

- To know the basics of data mining and warehousing.
- To Understand various techniques in data mining.
- To learn about architecture of data warehouse and its applications

COURSE OUTCOMES (CO)

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

CO Number	CO Statement
CO1	Explain the concept of IoT.
CO2	Analyze various protocols for IoT.
CO3	Analyze applications of IoT in real time scenario
CO4	Explain the data analytics and cloud in the context of IoT
CO5	Explain the concepts of SOCRADES.

MAPPING WITH PROGRAMME OUTCOMES

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

L-Low M-Medium H-High

SYLLABUS

UNIT I **(Hours:10)**

Introduction- Concepts behind the Internet of Things- The IoT Paradigm- Smart Objects- Creative Thinking Techniques – Modifications- Combination Scenarios- Breaking Assumptions- Solving Problems.

UNIT II **(Hours:11)**

M2M to IoT – A Market Perspective– Introduction, Some Definitions, M2M Value Chains, IoT Value Chains, An emerging industrial structure for IoT, The international driven global value chain and global information monopolies.

UNIT III **(Hours:10)**

M2M and IoT Technology Fundamentals- Devices and gateways, Local and wide area networking, Data management, Business processes in IoT, Everything as a Service(XaaS), M2M and IoT Analytics, Knowledge Management Introduction, Technical Design constraints-hardware is popular again.

UNIT IV **(Hours:10)**

Introduction, State of the art, **Architecture Reference Model-** Introduction, Reference Model and architecture, IoT reference Model**IoT Reference Architecture-** Introduction, Functional View, Information View, Deployment and Operational View, Other Relevant architectural views. **Real-World Design Constraints.**

UNIT V **(Hours:10)**

Service-oriented architecture-based device integration, SOCRADES: realizing the enterprise integrated Web of Things, IMC-AESOP: from the Web of Things to the Cloud of Things, Commercial Building Automation- Introduction, Case study: phase one-commercial building automation today.

REFERENCE BOOKS

S.No.	Author Name	Title of the Book	Publishers
1.	Vijay Madisetti and Arshdeep Bahga	Internet of Things (A Hands-on-Approach)	VPT
2.	Francis daCosta	Rethinking the Internet of Things: A Scalable Approach to Connecting Everything	Apress Publications
3.	Hakima chaouchi	The Internet Of Things Connecting Objects	
4.	Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle	From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence	Academic Press
5.	Vijay Madisetti and Arshdeep Bahga	Internet of Things (A Hands-on-Approach)	VPT

WEBSITE REFERENCES

- https://en.wikipedia.org/wiki/Internet_of_things
- https://internetofthingsagenda.techtarget.com/definition/Internet-of-Things-IoT
- https://www.techopedia.com/definition/28247/internet-of-things-iot
- https://www.iotforall.com › #askIoT
- https://www.wired.co.uk/article/internet-of-things-what-is-explained-iot

Means of Curriculum Delivery: Lecture, Group Learning, Seminar, Assignment, Google Classroom

SEMESTER III

Programme Code	M.Sc IT	Programme Title	Master of Science (Information Technology)	
Course Code	43P3ITCT18	Core 18: Web Programming	Batch	2024-2026
			Semester	III
Hours/week	4 Hours		Credits	3

COURSE OBJECTIVES:

- To learn about the basic concepts of various computer and internet.
- To learn about the concepts of cascading style sheet.
- To learn about the Java Scripts and XML.
- To learn about the various web servers.

COURSE OUTCOMES (CO)

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

CO Number	CO Statement
CO1	Gain deep understanding of the use and implementation of HTML 5 tags.
CO2	Understand the CSS, the role of JavaScript in web page creation.
CO3	Program, access, and manipulate data through the adoption of accepted standards, mark-up languages, client-side programming, and server-side programming
CO4	Predict the need of various web servers
CO5	To know about the client side scripting.

MAPPING WITH PROGRAMME OUTCOMES

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

L-Low M-Medium H-High

SYLLABUS

UNIT I **(Hours: 08)**

Introduction to Computers and internet: HTML5, CSS3, Javascript, W3C, Data Hierarchy, types of programming languages, HTML5: editing, example, validation service, headings, linking, images, characters, lists, tables, forms, meta elements, Input types, datalist elements, page structure elements.

UNIT II **(Hours: 10)**

Cascading Style Sheets: Inline, embedded style sheets, conflicting styles, Positioning elements, backgrounds, element dimensions, box model, menus, text shadows, corners, color, box shadows, radial gradient, multiple background, image borders.

UNIT III **(Hours: 10)**

Java Script:first script, prompt dialogs, memory, arithmetic, decision making. control statement – algorithms, pseudo code, control statements, if selection, if...else, while repetition, counter-controlled repetition, sentinel-controlled repetition, nested control statements, assignment operators, increment and decrement.

UNIT IV **(Hours: 10)**

Control Statements II: for repetition, switch multiple, do...while, break, continue and logical operators.Java Script function definitions and array declaring and allocating. XML: basics, structuring data, XML namespace, DTDs, XML vocabularies, DOM.

UNIT V **(Hours: 10)**

Web Servers (apache & IIS): HTTP transactions, Client-side scripting, accessing web servers, Apache, MySql, PHP Installation, Microsoft IIS. Web App development with ASP.Net in C#: web basics, multitier architecture, first ASP.NET, web controls, validation.

REFERENCE BOOKS

S. No	Author Name	Title of the Book	Publisher
1	Paul Deitel, Harvey Dietel and Abbey Dietel	"Internet & World Wide Web – How to Program"	Tata McGraw Hill.
2	Steve Suehring	"JavaScript – Step by Step"	PHI
3	Chris Bates,	Web Programming - Building Intranet Applications	Wiley Publications,

WEBSITE REFERENCES

- https://www.geeksforgeeks.org/html-introduction/
- https://www.w3schools.com/html/html5_intro.asp
- https://www.tutorialspoint.com/css/what_is_css.htm
- https://www.guru99.com/introduction-to-javascript.html
- https://www.c-sharpcorner.com/UploadFile/1d42da/web-service-basics/

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

SEMESTER III

Programme Code	M.Sc IT	Programme Title	Master of Science (Information Technology)	
Course Code	24P3ITCP19	Core 19: Network - Practical	Batch	2024-2026
			Semester	III
Hrs/week	4 Hours		Credits	3

COURSE OBJECTIVES

To enable the students

1.To learn the digital networks & internet protocols

2.To have a clear idea about various functions of TCP and UDP.

3.To learn about user networks interfaces and protocols of on B-ISDN and its operations and maintenance.

COURSE OUTCOMES (CO)

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

CO Number	CO Statement
CO1	Demonstrate LAN and WAN protocol behavior using Modern Tools.
CO2	Analyze data flow between peer to peer in an IP network using Application, Transport and Network Layer Protocols.
CO3	Demonstrate basic configuration of switches and routers.
CO4	Develop Client - Server architectures and prototypes by the means of correct standards and technology
CO5	Demonstrate basic configuration of TCP and UDP Sockets.

MAPPING WITH PROGRAMME OUTCOMES

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

L-Low M-Medium H-High

SYLLABUS

1. To write a Java program to perform sliding window.

2. Implementation of socket programming date and time display from client to server using TCP Sockets.

3. Write a code simulating ARP /RARP protocols.

4. Write a code simulating PING and TRACEROUTE commands.

5. Create a socket for HTTP for web page upload and download.

6. Write a program to implement RPC (Remote Procedure Call).

7. Implementation of Subnetting.

8. Applications using TCP Sockets like Echo client and echo server.

9. Applications using TCP Sockets like File Transfer.

10. Java program for Dns application program.

11. Java program for SNMP application program .

12. Java program for application using TCP and UDP Sockets Links.

WEBSITE REFERENCES:

- https://www.informit.com
- https://www.cisco.com
- https://www.ahirlabs.com
- https://www.ace-edu.in

Means of Curriculum Delivery : Power point presentation, Lab Assignments, Observation.

SEMESTER III

Programme Code	M.Sc IT	Programme Title	Master of Science (Information Technology)	
Course Code	24P3ITCP20	Core 20: Web Programming -Practical	Batch	2024-2026
			Semester	III
Hrs/week	4 Hours		Credits	3

COURSE OBJECTIVE:

To enable the students to

- Design the concept and usages of web based programming techniques.
- Develop the HTML documents using JavaScript and CSS.
- Use of different types of server side Applications
- Design and implement user interactive dynamic web based applications.
- Implement XML Namespace & PHP Programming.

COURSE OUTCOMES (CO)

At the end of the practical session, students should be well-versed in

CO Number	CO Statement
CO1	Demonstrating the concept and usages of web based programming techniques.
CO2	Demonstrating HTML Programs using JavaScript and CSS.
CO3	Demonstrating the different types of server side Applications
CO4	Designing interactive dynamic web based applications.
CO5	Demonstrating XML Namespace & PHP Programming.

MAPPING WITH PROGRAMME OUTCOMES

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

L-Low M-Medium H-High

SYLLABUS

HTML:

1. Write a HTML program with basic HTML Tags (Headings, Linking, Images with attributes, special characters).
2. Write a HTML program with basic HTML Tags (tables, lists, forms, meta elements).
3. Write a HTML program with HTML Tags (Input type tag – color, date, datetime, email, month, number).
4. Write a HTML program with HTML Tags (input, data list and auto complete attributes).

CSS:

5. Write a CSS program with inline styles, embedded style, linking, backgrounds, drop down menus.
6. Write a CSS program with positioning elements – absolute, z-index, relative and span.
7. Write a CSS program with text shadows, rounded corners, color, gradients and animations.
8. Write a CSS program with box shadows, text stroke, transition and transforms.

Java Script:

9. Write a Java script program with prompt dialogs (adding, subtracting, multiplication and dividing integers).
10. Write a Java script program with decision making – equality and relational operators.
11. Write a Java script program with control statements (if, if ... else, logical operators).
12. Write a Java script program with for, do...while, while and switch statements.
13. Write a Java script program with java script functions, arrays and objects.

XML:

14. Write a XML program with XML namespace, DTD.
15. Write a program to display the session count using PHP programming

WEBSITE REFERENCES

- https://www.geeksforgeeks.org/html-introduction/
- https://www.w3schools.com/html/html5_intro
- https://www.tutorialspoint.com/css/
- https://www.wikitechy.com/engineering-courses/it6503-web-programming-syllabus-notes

Means of Curriculum Delivery : Power point presentation, Lab Assignments, Observation

SEMESTER III

Programme Code	**M.Sc IT**	**Programme Title**	**Master of Science (Information Technology)**	
Course Code	**24P3ITCP21**	**Core 21: Cloud Computing Practical**	**Batch**	**2024-2026**
Hrs/week	**2**		**Semester**	**III**
			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

L-Low M-Medium H-High

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

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

SEMESTER III

Programme Code	M.Sc IT	Programme Title	Master of Science (Information Technology)	
Course Code	24P3ITET2A	Elective 2 : Soft Computing	Batch	2024-2026
Hours/week	4		Semester	III
			Credits	4

COURSE OBJECTIVES

- To enable the Students to learn the basic concepts of Soft Computing.
- To become familiar with various techniques like neural networks, genetic algorithms and fuzzy systems.
- To apply soft computing techniques to solve problems.
- To understand the basic principles and working of Genetic Algorithms.

COURSE OUTCOMES (CO)

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

CO Number	CO Statement
CO1	Apply suitable soft computing techniques for various applications.
CO2	Integrate various soft computing techniques for complex problems.
CO3	Explain the basic principles and working of Genetic Algorithms.
CO4	Summarize the basic Fuzzy Principles and fuzzy logic.
CO5	Describe the concept of neural networks and its applications.

MAPPING WITH PROGRAMME OUTCOMES

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

L-Low M-Medium H-High

SYLLABUS

UNIT I **(Hours:10)**

INTRODUCTION TO SOFT COMPUTING: Introduction-Artificial Intelligence-Artificial Neural Networks-Fuzzy Systems-Genetic Algorithm and Evolutionary Programming-Swarm Intelligent Systems-Classification of ANNs-McCulloch and Pitts Neuron Model-Learning Rules.

UNIT II **(Hours:10)**

ARTIFICIAL NEURAL NETWORKS: Back propagation Neural Networks – Kohonen Neural Network -Learning Vector Quantization -Hamming Neural Network – Hopfield Neural Network-Bi-directional Associative Memory -Adaptive Resonance Theory Neural Networks- Support Vector Machines – Spike Neuron Models.

UNIT III **(Hours:10)**

FUZZY SYSTEMS: Introduction to Fuzzy Logic, Classical Sets and Fuzzy Sets – Classical Relations and Fuzzy Relations -Membership Functions -Defuzzification – Fuzzy Arithmetic and Fuzzy Measures -Fuzzy Rule Base and Approximate Reasoning – Introduction to Fuzzy Decision Making.

UNIT IV **(Hours:08)**

GENETIC ALGORITHMS: Basic Concepts- Working Principles -Encoding- Fitness Function – Reproduction -Inheritance Operators – Cross Over – Inversion and Deletion -Mutation Operator – Bit-wise Operators -Convergence of Genetic Algorithm.

UNIT V **(Hours:12)**

HYBRID SYSTEMS: Hybrid Systems -Neural Networks, Fuzzy Logic and Genetic -GA Based Weight Determination – LR-Type Fuzzy Numbers – Fuzzy Neuron – Fuzzy BP Architecture – Learning in Fuzzy BP- Inference by Fuzzy BP – Fuzzy Art Map: A Brief Introduction – Soft Computing Tools – GA in Fuzzy Logic Controller Design – Fuzzy Logic Controll**er.**

REFERENCE BOOKS

S. No.	Author Name	Title of the Book	Publisher
1.	N.P.Padhy, S.P.Simon	Soft Computing with MATLAB Programming	Oxford University Press
2.	S.N.Sivanandam , S.N.Deepa	Principles of Soft Computing	Wiley India Pvt. Ltd
3.	S.Rajasekaran, G.A.Vijayalakshmi Pai	Neural Networks, Fuzzy Logic and Genetic Algorithm, Synthesis and Applications	PHI Learning Pvt. Ltd

WEBSITE REFERENCES

- https://en.wikipedia.org/wiki/Soft_computing
- https://en.wikipedia.org/wiki/Computing_platform
- https://www.britannica.com/technology/software
- https://www.khanacademy.org › Computing › Computer science › How Computers Work

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

SEMESTER III

Programme Code	**M.Sc IT**	**Programme Title**	**Master of Science (Information Technology)**	
Course Code	**24P3ITET2B**	**Elective 2 : Embedded System**	**Batch**	**2024-2026**
Hrs/week	**4**		**Semester**	**III**
			Credits	**4**

COURSE OBJECTIVES

- To learn the architecture and programming of ARM processor.
- To become familiar with the embedded computing platform design and analysis.
- To get thorough knowledge in interfacing concepts
- To design an embedded system and to develop programs

COURSE OUTCOMES (CO)

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

CO Number	**CO Statement**
CO1	Describe the architecture and programming of ARM processor
CO2	Explain the Concepts of peripherals and interfacing of sensors.
CO3	Capable of using the system design techniques to develop firmware
CO4	Illustrate the code for constructing a system
CO5	Explain the concepts of embedded systems.

MAPPING WITH PROGRAMME OUTCOMES

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

L-Low M-Medium H-High

SYLLABUS

UNIT I **(Hours:09)**

INTRODUCTION TO EMBEDDED COMPUTING AND ARM PROCESSORS: Complex systems and micro processors– Embedded system design process –Design example: Model train controller- Instruction sets preliminaries – ARM Processor – CPU: programming input and output- supervisor mode.

UNIT II **(Hours:10)**

EMBEDDED SYSTEM PLATFORM DESIGN: The CPU Bus-Memory devices and systems– Designing with computing platforms – consumer electronics architecture – platform-level performance analysis – Components for embedded programs- Models of programs- Assembly, linking and loading – compilation techniques.

UNIT III **(Hours:10)**

SENSOR INTERFACING WITH ARDUINO: Basics of hardware design and functions of basic passive components-sensors and actuators-Arduino code – library file for sensor interfacing-construction of basic applications

UNIT IV **(Hours:10)**

EMBEDDED FIRMWARE:Reset Circuit, Brown-out Protection Circuit-Oscillator Unit – Real Time Clock-Watchdog Timer – Embedded Firmware Design Approaches and Development Languages.

UNIT V **(Hours:11)**

EMBEDDED C PROGRAMMING: Introduction-Creating _hardware delays' using Timer 0 and Timer 1-Reading switches-Adding Structure to the code-Generating a minimum and maximum delay-Example: Creating a portable hardware delay- Timeout mechanisms-Creating loop timeouts-Testing loop timeouts- hardware timeouts-Testing a hardware timeout**.**

REFERENCE BOOKS

S. No.	Author Name	Title of the Book	Publishers
1.	Marilyn Wolf,	Computers as Components Principles of Embedded Computing System Design	Morgan Kaufmann Publisher
2.	Michael J. Pont	Embedded C	Pearson 2nd edition
3.	Shibu K.V	Introduction to Embedded Systems	Tata Mcgraw Hill

WEBSITE REFERENCES

- https://en.wikipedia.org/wiki/Embedded_system
- https://internetofthingsagenda.techtarget.com/definition/embedded-system
- https://www.tutorialspoint.com/embedded_systems/es_overview.htm
- https://www.techopedia.com/definition/3636/embedded-system

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

SEMESTER III

Programme Code	**M.Sc IT**	**Programme Title**	**Master of Science (Information Technology)**	
Course Code	**24P3ITET2C**	**Elective 2: Cloud Computing**	**Batch**	**2024-2026**
Hrs/week	**4**		**Semester**	**III**
			Credits	**4**

COURSE OBJECTIVES

To enable the students

- To understand security implications in cloud computing
- To understand the Cloud computing architectures, applications and challenges and learn about various cloud storages

COURSE OUTCOMES (CO)

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

CO Number	**CO Statement**
CO1	Explain the security implications in cloud computing
CO2	Analyse the trade-offs inherent in cloud computing
CO3	Identify the architecture and infrastructure of cloud computing, including Service models and Cloud Access.
CO4	Explain the core issues of cloud computing such as security, privacy, and interoperability
CO5	Identify problems, and explain, analyze, and evaluate various cloud computing solutions

MAPPING WITH PROGRAMME OUTCOMES

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

L-Low M-Medium H-High

SYLLABUS

UNIT - I **(Hours : 10)**

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 : 10)**

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 schedulesm managing projects, presenting on road.

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

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 : 10)**

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 : 10)**

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

S. No	Author Name	Title of the Book	Publishers
1.	Michael Miller	Cloud Computing	Pearson Education, New Delhi
2	Anthony T. Velte	Cloud Computing A Practical Approach	Tata Mcgraw Hill Education Private Limited
3.	Arshdeep Bahga	Cloud Computing: A Hands-On Approach	Paperback-Import,

WEBSITE REFERENCES

- https://en.wikipedia.org/wiki/Cloud_computing
- https://searchcloudcomputing.techtarget.com/definition/cloud-computing
- https://www.salesforce.com/what-is-cloud-computing/
- https://aws.amazon.com/what-is-cloud-computing
- https://www.techopedia.com/definition/2/cloud-computing

Means of Curriculum Delivery : Lecture, Group Learning, Seminar, Assignment, Google Classroom

SEMESTER III

Programme Code	**M.Sc IT**	**Programme Title**	**Master of Science (Information Technology)**	
Course Code	**24P3ITET2D**	**Elective 2:Software Quality Assurance**	**Batch**	**2024-2026**
Hrs/week	**4**		**Semester**	**III**
			Credits	**4**

COURSE OBJECTIVES

To enable the students

- To understand the importance and types of testing
- To understand the test strategy and execution and test automation

COURSE OUTCOMES (CO)

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

CO Number	**CO Statement**
CO1	Explain the software Development Life Cycles
CO2	Analyse the various types of testing
CO3	Explain the types of test cases
CO4	Explain the test Strategy And Execution
CO5	Identify the testing automation

MAPPING WITH PROGRAMME OUTCOMES

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

L-Low M-Medium H-High

SYLLABUS

UNIT - I **(Hours : 10)**

INTRODUCTION TO SOFTWARE TESTING: Importance of testing, testing as a career-Difference between Project and product-Difference between Quality Assurance and Quality Control-Tool selection criteria.Software Development Life Cycles (SDLC):Software Development Life Cycle Stages-Software Development Methodologies

UNIT -II **(Hours : 10)**

TYPES OF TESTING:Dynamic Testing- Black Box Testing, White box testing, Grey box testing,Functional Testing: GUI Testing, Boundary Value Analysis, Equivalence Class Partition, Error guessing, Negative testing, Back End testing, Database Testing, Compatibility Testing, Security testing, Portability testing, Configuration Testing, Recovery testing.Performance testing: Load testing, Stress testing, Soak testing, Spike testing, Scalability testing, Volume testing.

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

TEST CASES-Test cases and use case design-Test Case Parameters-Write/Review/Execute Test cases-Test Case Design Templates-Requirement Traceability Matrix (RTM)-Setting up Test Data-Importance of Test Data in Testing-Gathering Test Data-Advantages of Test Data Gathering

Design control: Standards and procedures for design and requirement.

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

TEST STRATEGY AND EXECUTION:-Learn Test Execution Life Cycle Process-Understand Different levels of Test Execution-Sanity/ Smoke Testing-Test Batches or Test Suite Preparation and Execution-Retesting-Regression Testing, What is Bug Leakage-Test Design. Document control: Configuration items-Change validation.

UNIT -V **(Hours: 10)**

AUTOMATION TESTING – Basics: Introduction to Automation Testing-What is Automation testing-Benefits of Automation Testing-Various Automation Test Tools. Object Repository-Working on test objects and object repository-Configuring Object Identification-Managing object repository. Product Identification: Tracebility-Configuration management.

REFERENCE BOOKS

S. No	Author Name	Title of the Book	Publishers
1.	Mordechai Ben-Menachem	Software quality producing practical, consistent software	Second Edition-2001. Thomson Asia Pte Ltd,Singapore
2	Kshirasagar Naik	Software Testing and Quality Assurance: Theory and Practice	Second Edition-Tata Mcgraw Hill,Education Private Limited

WEBSITE REFERENCES

- https://en.wikipedia.org/wiki/software quality assurance
- https://searchcloudcomputing.techtarget.com/definition/software quality assurance
- https://www.salesforce.com/what-is-software quality assurance
- https://aws.amazon.com/what-is-software quality assurance
- https://www.techopedia.com/definition/2/software quality assurance

Means of Curriculum Delivery : Lecture, Group Learning, Seminar, Assignment, Google Classroom

SEMESTER III

Programme Code	**M.Sc IT**	**Programme Title**	**Master of Science (Information Technology)**	
Course Code	**24P3ITET2E**	**Elective 2: Digital Forensics**	**Batch**	**2024-2026**
Hrs/week	**4 Hours**		**Semester**	**III**
			Credits	**4**

COURSE OBJECTIVES

To enable the students

- To be familiar with the students a hands-on exposure to the Digital Forensics
- To design and implement Key Technical Concepts
- To justify the applicability, or non-applicability, of Digital Forensics System for a specific application.
- To understand where the Digital Forensics could be effectively utilized by illustrations of applications of Digital Forensics

COURSE OUTCOMES (CO)

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

CO Number	**CO Statement**
CO1	Explain various Key Technical Concepts and data types and Memory Computing
CO2	Know the crime scenes and collecting evidences
CO3	Describe the Antiforensics and stegnography
CO4	Evaluate the Internet and E mail and Network Forensics
CO5	Explain the Mobile Device Forensics

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	H	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

L-Low M-Medium H-High

SYLLABUS

Unit-1 **Hours:10**

Introduction-Forensic Science- Uses of Digital Forensics- Locard's Exchange Principle Scientific Method Organizations **Key Technical Concepts** - Introduction Bits, Bytes, and Numbering Schemes File- Extensions and File Signatures -Storage and Memory Computing-Environments Data Types-

File Systems- Allocated and Unallocated Space How Magnetic Hard Drives Store Data Basic Computer Function

Unit-2 **Hours:10**

Collecting Evidence-Introduction- Crime Scenes and Collecting Evidence Documenting the Scene Chain of Custody Cloning Live System versus Dead System Hashing Final Report -In**Windows System Artifacts -**Introduction- Deleted Data Hibernation File (Hiberfile.Sys) -Registry Print Spooling -Recycle Bin-Metadata- Thumbnail Cache- Most Recently Used (MRU) -Restore Points and Shadow Copy

Unit-3 **Hours:10**

Antiforensics-Introduction- Hiding Data -Password Attacks -Steganography -Data Destruction. Legal Introduction- The Fourth Amendment Criminal Law—Searches Without a Warrant Searching with a Warrant Electronic Discovery (eDiscovery) Expert Testimony

Unit-4 **Hours:10**

Internet and E-Mail -Introduction -Internet- re Overview Web Browsers—Internet Explorer -E-Mail -Social Networking Sites **Network Forensics-** Introduction -Network Fundamentals- Network Security Tools- Network Attacks- Incident Response- Network Evidence and Investigations

Unit-5 **Hours:10**

Mobile Device Forensics -Introduction-Cellular Networks -Operating Systems -Cell Phone Evidence -Cell Phone Forensic Tools- Global Positioning Systems (GPS) **Looking Ahead-** Introduction -Standards and Controls -Cloud Forensics (Finding/Identifying Potential Evidence Stored In the Cloud) -Solid State Drives (SSD)- Speed of Change

REFERENCE BOOKS

S. No.	Author Name	Title of the Book	Publisher
1.	John Sammons	The Basics of Digital Forensics	Elseiver

WEBSITE REFERENCES

- https://www.elsevier.com/permissions
- https://techterms.com/definition/Digital Forensics

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

SEMESTER IV

SEMESTER IV

Programme Code	M.Sc IT	Programme Title	Master of Science (Information Technology)	
Course Code	24P4ITCV19	Core 19: PROJECT VIVA VOCE	Batch	2024-2026
Hrs/week	6		Semester	IV
			Credits	12

Objective: To enable the students to apply practically in a specific area using any specific domain knowledge he/she posses and get the results.

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 VOCE

1.Project work carries 200 marks with 20 credits

2.Internal Assessment: 160 marks (40 marks for 3 reviews and 40 marks for record) and External Assessment : 40 marks (Viva Voce)

3.For awarding a pass, a candidate should have obtained 50% of the total 200 Marks.

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.