FATIMA COLLEGE (AUTONOMOUS)

Re-Accredited with "A" Grade by NAAC (3rd Cycle)
74th Rank in India Ranking 2020 (NIRF) by MHRD
Maryland, Madurai- 625 018, Tamil Nadu, India

NAME OF THE DEPARTMENT: INFORMATION TECHNOLOGY

NAME OF THE PROGRAMME : M.Sc.

PROGRAMME CODE : PSIT

ACADEMIC YEAR : 2021-2022

M.Sc INFORMATION TECHNOLOGY

Minutes of the Meeting of the Board of Studies for M.Sc IT held at Department of Information Technology on 12.4.21

Members present:

1. Dr. G. Sumathi, Head - University Nominee
Department of Computer Science
Sri Meenakshi Government Arts college for women,
Madurai.

2. Dr. K. Kungumaraj, Head,
PG Department of Computer science,
Arulmigu palaniandavar Arts college for women,
Palani.

3. Sr. Jothi, Head,
Department of Computer Science,
Holy cross college,
Nagercoil.

4. Mrs. M. Thilagavathi Madhavan,
Senior programmer Analyst,
Aparajitha Corporate Service Pvt. Limited,
Madurai.

5. Ms. T.G. Poornima devi, Faculty,
Dolphin Elite school,
Madurai.
12/4/21

A. Mable Jasmine Shobha - A. Mable Jasmine Shobha.

V. Mageshwari - V.

T. Leena Prema kumari - T.

T. Charanya Nagammal. - T. Charanya

V. Jane Varamani Sulekha. - V. J. V. Sulekha

I. ACTION TAKEN REPORT:

The Action taken report for the academic year 2020-2021 was presented to the board members as,

Suggestions	Action taken
* 'Non-Relational database' concepts can be included in Dynamism unit of Data storage & Management course.	As suggested, the topics has been included.
* Python scrapping, API concepts can be included in python programing course.	Suggested topics has been included.

Change of course title - Nil ; New courses - Nil ; Revised courses - Nil

II. Updation of Digital Open Educational Resources in the list of references of each course has been presented in the following format.

Course code	Course Title	Details of updation.

III. REVISION OF COURSES:

S.NO	COURSE CODE	COURSE TITLE	REVISED CONTENT	% of REVISION	NEED FOR REVISION	RELEVANCE TO L	R	N	S	SCOPE FOR # EM	ET	SD
1.	21PG1IT5	JAVA & J2ME LAB	programs using J2ME is introduced	15%	Board member suggestion				✓		✓	
2.	21PS3IT13	Advanced Python programming	unit 5: Database connectivity concepts are introduced.	20%	Board member suggestion				✓		✓	

IV. NEW COURSES INTRODUCED:

S NO	COURSE CODE	COURSE TITLE	RELEVANCE TO *				SCOPE FOR #			NEED FOR INTRODUCTION
			L	R	N	G	EM	ET	SD	
1.	21PG1IT1	JAVA & J2EE				✓	✓			Industrial Requirement.
2.	21PG1IT2	Soft computing				✓			✓	Industrial Requirement.
3.	21PG1IT3	Data Management using R programming				✓	✓			IT field Requirement.
4.	21PG2IT7	Data Science				✓			✓	Industrial Requirement.
5.	21PG2ITE1	Adhoc Network				✓			✓	To gain knowledge on various network concepts.
6.	21PG2ITE2	Machine Learning				✓	✓			To gain knowledge on various Machine Learning concepts.
7.	21PG2ITE3	Cyber Security				✓			✓	To create awareness about security.
8.	21PG3ITE5	Ethical Hacking				✓	✓			To create awareness about the various ethical hacking techniques.

S.NO	COURSE CODE	COURSE TITLE	RELEVANCE TO *				SCOPE FOR #			NEED FOR INTRODUCTION
			L	R	N	Q	EM	ET	SD	
9.	21PG3ITE6	Compute Forensics				✓			✓	To impart the skills in Compute Forensics
10.	21PG4ITE6	Biometrics				✓			✓	To impart knowledge in Biometric concepts.
11.	21PGCAISLI71	Supply chain Management				✓	✓			Industrial Requirement.
12.	21PG2ITSL1	Linux shell Programming				✓	✓			Industrial Requirement.
13.	21PG3ITSL1	Research Methodology				✓			✓	To impart the importance of research.
14.	21PG4ITSL1	Artificial Intelligence				✓			✓	According to IT field need.

2. Introduction of purely Skill-Embedded certificate / Diploma/ Advanced Diploma value-added course other than the value-added course that is already being offered - Nil.

V. RUBRICS FOR INTERNSHIP / PROJECT:

S.NO	C1 20 MKS	C2 20 MKS	CIA TOTAL 40 MKS	EXTERNAL 60 MKS
1.	Review I : * Selection * presentation	Review II : *Presentation * Completion	C1 + C2	*Presentation *Implementation

VI. DETAILS OF PROPOSED MOU:

* Proposal for signing an MOU with Swasthik Infotech solutions, Madurai.

VII. COMMENDATIONS:

* Introduction of Self-Learning courses for Advanced Learners are appreciated.

SEMESTER - I

21PG1IT1 - JAVA & J2ME
21PG1IT2 - Soft Computing
21PG1IT3 - Data Management using R-Programming
21PG1IT4 - Distributed Operating System
21PG1IT5 - Lab I : JAVA & J2ME
21PG1IT6 - Lab II : Data Management using R-programming
21IT1EDC - Animation Software

SEMESTER II:

21PG2IT7 - Data Science
21PG2IT8 - Digital Image processing
21PG2IT9 - Android programming
21PG2IT10 - Lab III: Image processing
21PG2IT11 - Lab IV: Android programming
21IT2EDC - Animation Software
21PG2ITE1 - Adhoc network
21PG2ITE2 - Machine Learning
21PG2ITE3 - Cyber Security

SEMESTER III:

21PG3IT12 - Data Mining and Data Warehousing
21PG3IT13 - Advanced Python Programming
21PG3IT14 - Lab V: Data Mining and Data warehousing
21PG3IT15 - Lab VI: Python Programming
21PG3ITSI - Internship / Summer project
21PG3ITE4 - Software Testing
21PG3ITE5 - Ethical Hacking
21PG3ITE6 - Computer Forensics
21PG3ITE7 - Big Data Analytics
21PG3ITE8 - Internet of Things
21PG3ITE9 - Mobile Communication

SEMESTER IV:

21PG4ITPR - Project & viva voce
21PG4IT16 - Biometrics

Members:

Dr. S. Sumathi -

Dr. K. Kanyumaraj -

Sr. Jothi -

Mrs. M. Thilagavathi Madhavan - M. Thilagavathi

Ms. T. S. Poornima devi -

Ms. A. Mabel Jasmine Shobha A. Mabel Jasmine Shobha.

Mrs. V. Mageshwari -

Ms. T. Leena Prema Kumari -

Mrs. T. Charanya nagammal - T. Charanya

Ms. V. Janavarasamani Sulekha - V.J.V. Sulekha

12/04/2021

S. No	SEM.	COURSE CODE	COURSE TITLE	HRS	CREDITS	CIA Mks	ESE Mks	TOT. MKs
1.	I	21PG1IT1	Java & J2ME	4	4	40	60	100
2.		21PG1IT2	Soft Computing	4	4	40	60	100
3.		21PG1IT3	Data Management using R Programming	4	4	40	60	100
4.		21PG1IT4	Distributed Operating System	4	4	40	60	100
5.		21PG1IT5	LAB I: Java & J2ME	5	3	40	60	100
6.		21PG1IT6	LAB II : Data Management using R-Programming	5	3	40	60	100
7.	II	21PG2IT7	Data Science	4	4	40	60	100
8.		21PG2IT8	Digital Image Processing	4	4	40	60	100
9.		21PG2IT9	Android Programming	4	4	40	60	100
10.		21PG2IT10	LAB III : Digital Image Processing	5	3	40	60	100
11.		21PG2IT11	LAB IV: Android Programming	5	3	40	60	100
12.	III	21PG3IT12	Data Mining and Data Warehousing	5	5	40	60	100
13.		21PG3IT13	Python Programming	5	5	40	60	100
14.		21PG3IT14	LAB V: Data Mining and Data Warehousing	5	3	40	60	100
15.		21PG3IT15	LAB VI: Python Programming	5	3	40	60	100
16.	IV	21PG4IT16	Bio Metrics	-	4	40	60	100
			Total	**68**	**60**			

MAJOR ELECTIVE / EXTRA DEPARTMENTAL COURSE / INTERNSHIP/ PROJECT

S. No	SEM.	COURSECODE	COURSE TITLE	HRS	CREDITS	CIA Mks	ESE Mks	TOT. Mks
1.	I	21IT1EDC	EDC 1- Animation Software	3	3	40	60	100
2.	II	21IT2EDC	EDC 2 - Animation Software	3	3	40	60	100
3.		21PG2ITE1/ 21PG2ITE2/ 21PG2ITE3	Elective - I Adhoc Network/ Machine Learning/ Cyber Security/	4	5	40	60	100
4.	III	21PG3ITE4/ 21PG3ITE5/ 21PG3ITE6	Elective - II Software Testing/ Ethical Hacking/ Computer Forensics	4	4	40	60	100
5.		21PG3ITE7/ 21PG3ITE8/ 21PG3ITE9	Elective - III Big Data Analytics/ Internet of Things/ Mobile Communication/	5	5	40	60	100
6.		21PG3ITSI1	Internship	-	3	50	50	100
7.	IV	21PG4ITPR	Project & Viva Voce	-	6	50	50	100
			TOTAL	**19**	**29**			

OFF-CLASS PROGRAMMES

ADD-ON COURSES

COURSE CODE	COURSES	HRS.	CREDITS	SEMESTER IN WHICH THE COURSE IS OFFERED	CIA MKS	ESE MKS	TOTAL MARKS
	SOFT SKILLS	40	4	I	40	60	100
	COMPUTER APPLICATIONS	40	4	II	40	60	100
	COMPREHENSIVE VIVA (Question bank to be prepared for all the papers by the respective course teachers)	-	2	IV	-	-	100
	READING CULTURE	15/ Semester	1	I-IV	-	-	-
	TOTAL		**11**				

EXTRA CREDIT COURSES

COURSE CODE	COURSES	HRS.	CREDITS	SEMESTER IN WHICH THE COURSE IS OFFERED	CIA MKS	ESE MKS	TOTAL MARKS
21PGCASLIT1	**SELF LEARNING COURSE for ADVANCED LEARNERS** **SUPPLY CHAIN MANAGEMENT**	-	2	I	40	60	100

21PG2ITSL1	**Linux Shell Progamming**	-	2	I	40	60	100
21PG3ITSL1	**Research Methodology**	-	2	I	40	60	100
21PG4ITSL1	**Artificial Intelligence**	-	2	I	40	60	100
	MOOC COURSES / International Certified online Courses (Department Specific Courses/any other courses) * Students can opt other than the listed course from UGC-SWAYAM /UGC /CEC	-	Minimum 2 Credits	I – IV	-	-	

- **Lab Courses :**
  - A range of 10-15 experiments per semester

- **Summer Internship:**
  - Duration-1 month (2nd Week of May to 2nd week of June-before college reopens)
- **Project:**
  - Off class
  - Evaluation components-Report writing + Viva Voce (Internal marks-40) + External marks 60
- **EDC:**

Syllabus should be offered for two different batches of students from other than the parent department in Sem-I & Sem-II

I M.Sc.IT

SEMESTER –I

For those who joined in 2021 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	21PG1IT1	JAVA & J2ME	Lecture	4	4

COURSE DESCRIPTION

This course provides various techniques of Java Programming and help them to create effective programs in this language.

COURSE OBJECTIVES

This course is aimed to apply variety of technologies in JAVA for different platforms.

UNITS

UNIT –I INTRODUCTION& BASIC CONCEPTS (11 HRS.)

Java Program Structure-Java Tokens-Java Statements- Implementing a Java Program-Java Virtual machine. Packages: Introduction- Java API Packages- Using System Packages- Nesting Conventions-Creating Packages- Accessing a Package- Using a Package- Adding a Class to a Package- Hiding Classes Applet Programming: Introduction- How Applets Differ from Applications- Preparing to Write Applets – Building Applet Code- Applet Life Cycle- Creating an Executable Applet- Designing a web page- Applet Tag-Adding Applet to HTML File- Running the Applet- More about Applet Tag- Passing Parameters to Applets- Aligning the Display – More About HTML Tags- **Displaying Numerical Values- Getting input from the user (Self Study)**

UNIT –II SWINGS (11 Hrs)

GUI Programming with Swing: Introducing Swing – Two key swing features – The MVG Connection – Components and Containers – Swing Packages – Event Handling – Swing Applet – Painting in Swing.

Exploring Swing: JLabel and ImageIcon – JTextField – The Swing Buttons – JTabbedPane – **JScrollPane – JList – JComboBox – Trees – JTable (Self Study)**.

UNIT –III: JDBC (12 Hrs)

JDBC- Java Database Connectivity: Introducing JDBC Driver Types - Creating Your First First JDBC Program – Performing Batch Updates – Using Save points - Configuring the JDBC-ODBC Bridge- Explaining Database Connection pools and data sources-**Revisiting DBProcessor-Using the RowSet Interface (Self Study)**

UNITIV : J2ME Overview (12 Hrs)

Inside J2ME - J2ME and Wireless devices – J2ME Architecture – MIDlet Programming- J2ME Software development kits – J2ME Style- Multiple MIDlets- J2ME wireless toolkit.

UNIT V : J2ME UI (12 Hrs)

Commands- Items- Event Processing- High level Display : Screens – Low level Display :Canvas

UNIT –VI DYNAMISM (Evaluation Pattern-CIA only) (3 Hrs)

Implementation of Real-time application using JAVA

REFERENCES:

1. E. Balagurusamy, "Programming with JAVA", TataMcGraw-Hill Publications, 2015, 5th Edition.
2. ***Java The Complete Reference,*** Herbert Schildt 9thEdition, Mc Graw Hill Education, 2016.
   Chapters: 22, 30, 31, 32, 33,38
3. ***James McGovern***, Rahim Adatia and others, ***J2EE 1.4 Bible,*** 1st Edition, Wiley India (P) Ltd, (2008). Chapters: 6,7,18
4. Philip Heller and Simon Roberts, "JAVA 2 Developer's Handbook", BPB Publications, 2000
5. C.Xavier , "Projects on JAVA", SCITECH Publications
6. Cay S. Horstmann GaryCornell,"Core Java Volume I fundamentals" , Pearson Education, 2008, Eigth edition.
7. Jamie Jaworski, "Java 2 Platform Unleashed" , Techmedia Publications, 1999

Digital Open Educational Resources

(DOER):https://www.tutorialspoint.com/java/index.htm

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1	**INTRODUCTION & BASIC CONCEPTS**			
1.1	Java Program Structure-Java Tokens-Java Statements-Implementing a Java Program-Java Virtual machine	1	Chalk & Talk	Black Board
1.2	Packages: Introduction- Java API Packages- Using System Packages- Nesting Conventions-	1	Chalk & Talk	LCD

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
	Creating Packages- Accessing a Package- Using a Package- Adding a Class to a Package- Hiding Classes .			
1.3	Applet Programming: Introduction- How Applets Differ from Applications- Preparing to Write Applets – Building Applet Code- Applet Life Cycle-	4	Lecture	PPT & White board
1.4	Creating an Executable Applet- Designing a web page- Applet Tag-Adding Applet to HTML File- Running the Applet-	2	Lecture	Smart Board
1.5	More about Applet Tag- Passing Parameters to Applets- Aligning the Display – More About HTML Tags	2	Lecture	Black Board
1.6	Displaying Numerical Values- Getting input from the user(Self Study)	1	Discussion	Google classroom
UNIT -2 SWINGS				
2.1	GUI Programming with Swing: Introducing Swing – Two key swing features – The MVG Connection – Components and Containers	1	Lecture	Green Board Charts
2.2	– Swing Packages – Event Handling – Swing Applet – Painting in Swing	3	Chalk & Talk	Green Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
2.3	Exploring Swing: JLabel and ImageIcon – JTextField – The Swing Buttons- JTabbedPane	3	Chalk & Talk	Green Board
2.4	JScrollPane – JList – JComboBox-Trees – JTable(self study)	4	Discussion	Google Classroom
UNIT -3 SWINGS MENUS				
3.1	Swing Menus: Menu Basics – Overview of JMenuBar, JMenu, and JMenuItem	3	Chalk & Talk	Black Board
3.2	Create a Main Menu – Add Mnemonics and Accelerators to Menu Item	3	Chalk & Talk	LCD
3.3	Add Images and Tooltips to Menu Items – Use JRadioButtonMenuItem and JCheckBoxMenuItem	3	Lecture	Smart Board
3.4	Create a Popup Menu – Create a Toolbar – Use Actions – Entire MenuDemo Program Together(Self Study)	2	Discussion	Google Classroom
UNIT -4 JDBC				
4.1	JDBC- Java Database Connectivity: Introducing JDBC Driver Types - Creating Your First First JDBC Program	3	Chalk & Talk	Black Board
4.2	Performing Batch Updates – Using Save points - Configuring the JDBC-ODBC Bridge-.	3	Lecture	Smart Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
4.3	ExplainingDatabase Connection pools and data sources	3	Chalk & Talk	LCD
4.4	Revisiting DBProcessor-Using the RowSet Interface(Self Study)	3	Discussion	Google Classroom
UNIT -5 J2ME UI				
5.1	Background, The Life Cycle of a Servlet	3	Lecture	Smart Board
5.2	Using Tomcat For Servlet Development, A Simple Servlet-Servlet	3	Chalk & Talk	Black Board
5.3	API: The Javax Servlet Package, Reading Servlet Parameters, Javax. Servlet .http Package, Handling HTTP Requests & Responses	3	Chalk & Talk	LCD
5.4	Using Cookies, Session Tracking, Security Issues	3	Chalk & Talk	LCD
UNIT -6 DYNAMISM				
6.1	Implementation of Real-time application	3	Assignment & Group discussion	PPT

INTERNAL - PG

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1	T2	Seminar	Assignment	OBT/PPT				

	10 Mks.	10 Mks.	5 Mks.	5 Mks	5 Mks	35 Mks.	5 Mks.	40Mks.	
K2	**4**	**4**	**-**	**-**	**-**	**8**	-	**8**	20 %
K3	**2**	**2**	**-**	**5**	**-**	**9**	-	**9**	22.5 %
K4	**2**	**2**	**-**	**-**	**5**	**9**	-	**9**	22.5 %
K5	**2**	**2**	**5**	**-**	**-**	**9**	-	**9**	22.5 %
Non Scholastic	**-**	**-**	**-**	**-**	-		**5**	**5**	12.5 %
Total	**10**	**10**	**5**	**5**	**5**	**35**	**5**	**40**	**100 %**

End Semester - PG

Levels	Section A 10 Mks	Section B 20 Mks.	Section C 10 Mks	Section D 10 Mks.	Section E 10 Mks.	Total 60Mks.	
K2	**10**	**5**	**-**	**-**	**-**	**15**	25 %
K3	**-**	**5**	**10**	**-**	**-**	**15**	25 %
K4	**-**	**5**	**-**	**-**	**10**	**15**	25 %
K5	**-**	**5**	**-**	**10**	**-**	**15**	25 %
Total	**10**	**20**	**10**	**10**	**10**	**60**	**100 %**

CIA

Scholastic	**35**
Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	C6	CIA	ESE	Total
10	10	5	5	5	5	40	60	100

- **PG CIA Components**

			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	2 *	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Seminar	1	-	5 Mks
C6	-	Attendance		-	5 Mks

****The best out of two will be taken into account***

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	To understand the structure and model of the Java programming language.	K2	PSO1, PSO4

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 2	To explain the concepts of Packages, Interfaces and strings.	K2, K3	PSO4, PSO5
CO 3	To develop software implementing Exception handling mechanisms	K3, K4	PSO3, PSO6
CO 4	To design software for database connectivity and able to design GUI applications	K3, K4	PSO3, PSO9
CO 5	To implement server side programming using SERVLETS	K4, K5	PSO6, PSO8

Mapping of C0s with PSOs

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3	2	1	3	2	1	1	1	1
CO2	1	1	2	3	2	3	1	1	1
CO3	2	1	1	1	3	3	1	1	1
CO4	1	1	1	3	1	1	1	1	3
CO5	1	1	2	1	2	3	1	3	2

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	3	2	1	1
CO2	3	2	1	1
CO3	3	2	1	1
CO4	3	2	1	1
CO5	3	2	1	1

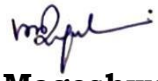
Note: Strongly Correlated – **3** Moderately Correlated – **2**

 Weakly Correlated -**1**

COURSE DESIGNER:

1. **Mrs. V. Mageshwari**

Forwarded By



V. Mageshwari

HOD'S Signature & Name

I M.Sc.IT

SEMESTER –I

For those who joined in 2021 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	21PG1IT2	SOFT COMPUTING	Lecture	4	4

COURSE DESCRIPTION

This course emphasizes learning various soft computing techniques.

COURSE OBJECTIVES

To facilitate the student to apply soft computing techniques to solve problems.

UNITS

UNIT –I INTRODUCTION (12 HRS.)

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: Hebbian and Delta- Perceptron Network-Adaline Network-Madaline Network.

UNIT –II: ARTIFICIAL NEURAL NETWORKS (12 HRS.)

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: FUZZY SYSTEMS (12 HRS.)

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 :GENETIC ALGORITHMS (12 HRS.)

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: SWARM INTELLIGENT SYSTEM (11 HRS.)

Introduction – Ant Colony System – Any colony Optimization – particle Swarm Intelligent Systems – Artificial Bee colony System

UNIT –VI: DYNAMISM (Evaluation Pattern-CIA only) (1 HRS.)

Ant colony System

TEXT BOOK:

1. N.P.Padhy, S.P.Simon, “Soft Computing with MATLAB Programming”, Oxford University Press, 2015.

   Unit I – Chapter 1
   Unit II – Chapter 3, 4
   Unit III – Chapter 5, 6
   Unit IV – Chapter 7
   Unit V – Chapter 8

REFERENCE BOOK:

1. S.N.Sivanandam ,S.N.Deepa, “Principles of Soft Computing”, Wiley India Pvt. Ltd., 2nd Edition, 2011.
2. S.Rajasekaran, G.A.VijayalakshmiPai, “Neural Networks, Fuzzy Logic and

Genetic Algorithm, Synthesis and Applications “, PHI Learning Pvt. Ltd., 2017.
3. Jyh-Shing Roger Jang, Chuen-Tsai Sun, EijiMizutani, —Neuro-Fuzzy and Soft Computing, Prentice-Hall of India, 2002.
4. KwangH.Lee, —First course on Fuzzy Theory and Applications, Springer, 2005.
5. George J. Klir and Bo Yuan, —Fuzzy Sets and Fuzzy Logic-Theory and Applications, Prentice Hall, 1996.
6. James A. Freeman and David M. Skapura, —Neural Networks Algorithms, Applications, and Programming Techniques, Addison Wesley, 2003.

Digital Open Educational Resources (DOER) :

1) https://www.javatpoint.com/what-is-soft-computing

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 INTRODUCTION				
1.1	Introduction-Artificial Intelligence	1	Discussion	Black Board
1.2	Artificial Neural Networks-Fuzzy Systems	1	Chalk & Talk	Black Board
1.3	Genetic Algorithm and Evolutionary Programming	2	Lecture	LCD
1.4	Swarm Intelligent Systems-Classification of ANNs-McCulloch and Pitts Neuron Model	2	Discussion	Google classroom
1.5	Learning Rules: Hebbian and Delta	2	Chalk & Talk	Black Board
1.6	Perceptron Network-Adaline Network	2	Chalk & Talk	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
1.7	Madaline Network.	2	Lecture	PPT & White board
UNIT -2 ARTIFICIAL NEURAL NETWORKS				
2.1	Back propagation Neural Networks	2	Lecture	PPT &White board
2.2	Kohonen Neural Network - Learning Vector Quantization	2	Chalk & Talk	Green Board
2.3	Hamming Neural Network – Hopfield Neural Network	2	Chalk & Talk	Black Board
2.4	Bi-directional Associative Memory	2	Chalk & Talk	Black Board
2.5	Adaptive Resonance Theory Neural Networks- Support Vector Machines	2	Chalk & Talk	Black Board
2.6	Spike Neuron Models	2	Chalk & Talk	Black Board
UNIT – 3 FUZZY SYSTEMS				
3.1	Introduction to Fuzzy Logic	2	Discussion	PPT & White board
3.2	Classical Sets and Fuzzy Sets	2	Chalk &Talk	Green Board
3.3	Classical Relations and Fuzzy Relations	2	Chalk & Talk	Black Board
3.4	Membership Functions - Defuzzification	2	Chalk & Talk	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
3.5	Fuzzy Arithmetic and Fuzzy Measures -Fuzzy Rule Base and Approximate Reasoning	2	Discussion	Black Board
3.6	– Introduction to Fuzzy Decision Making.	2	Lecture	PPT & White board
UNIT – 4 GENETIC ALGORITHMS				
4.1	Basic Concepts- Working Principles	2	Discussion	PPT & White board
4.2	Encoding- Fitness Function	2	Chalk & Talk	Green Board
4.3	Reproduction -Inheritance Operators	2	Chalk & Talk	Black Board
4.4	Cross Over – Inversion and Deletion	2	Chalk & Talk	Black Board
4.5	Mutation Operator	2	Discussion	Black Board
4.6	Bit-wise Operators - Convergence of Genetic Algorithm	2	Lecture	Green Board
UNIT – 5 SWARM INTELLIGENT SYSTEM				
5.1	Introduction	2	Lecture	PPT & White board
5.2	Ant Colony System	2	Chalk & Talk	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
5.3	Any colony Optimization	2	Lecture	Black Board
5.4	particle Swarm Intelligent Systems	2	Chalk & Talk	Black Board
5.5	Artificial Bee colony System	2	Chalk & Talk	Black Board
5.6	Artificial Bee colony System	2	Chalk &Talk	Black Board
UNIT –6 DYNAMISM				
6.1	Ant colony System	1	Discussion	Black Board

INTERNAL - PG

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1 10 Mks.	T2 10 Mks.	Seminar 5 Mks.	Assignment 5 Mks	OBT/PPT 5 Mks	35 Mks.	5 Mks.	40Mks.	
K2	**4**	**4**	**-**	**-**	**-**	**8**	-	**8**	20 %
K3	**2**	**2**	**-**	**5**	**-**	**9**	-	**9**	22.5 %
K4	**2**	**2**	**-**	**-**	**5**	**9**	-	**9**	22.5 %
K5	**2**	**2**	**5**	**-**	**-**	**9**	-	**9**	22.5 %
Non Scholastic	**-**	**-**	**-**	**-**	-		**5**	**5**	12.5 %

Total	**10**	**10**	**5**	**5**	**5**	**35**	**5**	**40**	**100 %**

End Semester - PG

Levels	Section A 10 Mks	Section B 20 Mks.	Section C 10 Mks	Section D 10 Mks.	Section E 10 Mks.	Total 60Mks.	
K2	**10**	**5**	**-**	**-**	**-**	**15**	25 %
K3	**-**	**5**	**10**	**-**	**-**	**15**	25 %
K4	**-**	**5**	**-**	**-**	**10**	**15**	25 %
K5	**-**	**5**	**-**	**10**	**-**	**15**	25 %
Total	**10**	**20**	**10**	**10**	**10**	**60**	**100 %**

CIA

Scholastic	**35**
Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	**C2**	**C3**	**C4**	**C5**	**C6**	**CIA**	**ESE**	**Total**
10	**10**	**5**	**5**	**5**	**5**	**40**	**60**	**100**

- **PG CIA Components**

Nos

C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	2 *	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Seminar	1	-	5 Mks
C6	-	Attendance		-	5 Mks

****The best out of two will be taken into account***

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Understand basic model in soft computing	K2	PSO1&PSO2
CO 2	Elaborate artificial neural network concepts	K2, K4	PSO3
CO 3	Be familiar with design of various neural networks	K2	PSO5&PSO6
CO 4	Understand genetic programming.	K4, K6	PSO4
CO 5	exposed to various hybrid systems.	K4	PSO8

Mapping COs Consistency with PSOs

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3	3	1	1	1	1	1	1	1
CO2	1	1	3	1	1	1	1	1	1
CO3	2	1	1	1	3	3	1	1	1
CO4	1	1	1	3	1	1	1	1	1
CO5	1	1	2	1	2	1	1	3	2

Mapping of COs with Pos

CO/ PSO	PO1	PO2	PO3	PO4
CO1	3	2	1	1
CO2	3	2	1	1
CO3	3	2	1	1
CO4	3	2	1	1
CO5	3	2	1	1

Note: Strongly Correlated – **3** Moderately Correlated – **2**

 Weakly Correlated -**1**

COURSE DESIGNER:

1. **Staff Name: Dr. V. Jane Varamani Sulekha**

Forwarded By

V. Mageshwari

HOD'S Signature & Name

I M.Sc.IT

SEMESTER –I

For those who joined in 2021 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	21PG1IT3	DATA MANAGEMENT USING R-PROGRAMMMING	Lecture	4	4

COURSE DESCRIPTION:

This course provides an in-sight to learn and understand the concepts of relational database management and its programming using R.

COURSE OBJECTIVES :

The course is aimed to expose the student to the fundamental concepts and techniques in database use and development as well provides a foundation for data management and storage using R.

UNITS

UNIT I :DATA INPUT,OUTPUT & MANAGEMENT (11 Hrs)

Input-Output- Structure and Metadata – Derived variables and data manipulation – Merging, combining, and subsetting datasets – data and time

variables – Probability distributions and random number generation – Mathematical functions – Matrix operations.

UNIT II : PROGRAMMING & COMMON STATISTICAL PROCEDURES (11 Hrs)

Control flow, programming and data generation – functions – Integration with the operating system – Summary statistics – Contingency tables – Tests for continuous variables.

UNIT –III :LINEAR REGRESSION AND ANOVA (11 Hrs)

Model fitting – Tests, contrasts, and linear functions of parameters – Model results and diagnostics – Model parameters and results – Generalized linear model – Further generalization – Robust methods – Models for correlated data – Survival analysis.

UNIT –IV : GRAPHICAL COMPENDIUM AND CONFIGURATIONS (11 Hrs)

Univariate plots – Univariate plots by grouping variable – Bivariate plots – Multivariate plots – Special purpose plots - Adding elements – Options and parameters – saving graphs.

UNIT –V: SIMULATIONS ADVANCED STATISTICAL METHODS (11 Hrs)

Generating data – Simulation applications – Bayesian methods – Propensity scores – Bootstrapping – Missing data.

UNIT –VI DYNAMISM (Evaluation Pattern-CIA only) (5 Hrs)

R Data Frame: Create, Append, Select, Subset - R Vs Python - SAS Vs R

TEXT BOOKS :

1. “Using R and RStudio for DataManagement, Statistical Analysis, and Graphics” , by Nicholas J. Horton and Ken Kleinman, CRC Press, New York, Second Edition
2. “Beginning R – The Statistical Programming Language”, by Dr. Mark Gardener, Wiley India Pvt., Ltd., 2017.

REFERENCE :

1. Frank. P. Coyle, “XML, Web Services and The Data Revolution”, Pearson Education,2012.

Digital Open Educational Resources (DOER) :

https://www.atnyla.com/syllabus/r-programming-language/7

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 DATA INPUT,OUTPUT & MANAGEMENT				
1.1	Input-Output- Structure and Metadata	1	Discussion	Black Board
1.2	Derived variables and data manipulation	1	Chalk & Talk	Black Board
1.3	Merging, combining, and sub setting datasets	2	Lecture	LCD
1.4	Data and time variables	2	Discussion	Google classroom
1.5	Probability distributions and random number generation	2	Chalk & Talk	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
1.6	Mathematical functions – Matrix operations.	2	Chalk & Talk	Black Board
UNIT -2 PROGRAMMING & COMMON STATISTICAL PROCEDURES				
2.1	Control flow	1	Lecture	PPT & White board
2.2	Programming and data generation	2	Chalk & Talk	Green Board
2.3	Functions	2	Chalk & Talk	Black Board
2.4	Integration with the operating system	2	Chalk & Talk	Black Board
2.5	Summary statistics	2	Chalk & Talk	Black Board
2.6	Contingency tables – Tests for continuous variables.	2	Chalk & Talk	Black Board
UNIT – 3 LINEAR REGRESSION AND ANOVA				
3.1	Model fitting – Tests, contrasts, and linear functions of parameters	1	Discussion	PPT & White board
3.2	Model results and diagnostics	2	Chalk &Talk	Green Board
3.3	Model parameters and results	2	Chalk & Talk	Black Board
3.4	Generalized linear model	2	Chalk & Talk	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
3.5	Further generalization – Robust methods	2	Discussion	Black Board
3.6	Models for correlated data – Survival analysis.	2	Lecture	PPT & White board
UNIT – 4 GRAPHICAL COMPENDIUM AND CONFIGURATIONS				
4.1	Univariate plots	1	Discussion	PPT & White board
4.2	Univariate plots by grouping variable	2	Chalk & Talk	Green Board
4.3	Bivariate plots – Multivariate plots	2	Chalk & Talk	Black Board
4.4	Special purpose plots	2	Chalk & Talk	Black Board
4.5	Adding elements	2	Discussion	Black Board
4.6	Options and parameters – saving graphs.	2	Lecture	Green Board
UNIT – 5 SIMULATIONS ADVANCED STATISTICAL METHODS				
5.1	Generating data	1	Lecture	PPT & White board
5.2	Simulation applications	2	Chalk & Talk	Black Board
5.3	Bayesian methods	2	Lecture	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
5.4	Propensity scores	2	Chalk & Talk	Black Board
5.5	Bootstrapping	2	Chalk & Talk	Black Board
5.6	Missing data.	2	Chalk & Talk	Black Board
UNIT –6 DYNAMISM				
6.1	R Data Frame: Create, Append, Select	2	Discussion	Black Board
6.2	Subset - R Vs Python - SAS Vs R	2	Discussion	Black Board

INTERNAL - PG

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1 10 Mks.	T2 10 Mks.	Seminar 5 Mks.	Assignment 5 Mks	OBT/PPT 5 Mks	35 Mks.	5 Mks.	40Mks.	
K2	**4**	**4**	**-**	**-**	**-**	**8**	-	**8**	20 %
K3	**2**	**2**	**-**	**5**	**-**	**9**	-	**9**	22.5 %
K4	**2**	**2**	**-**	**-**	**5**	**9**	-	**9**	22.5 %
K5	**2**	**2**	**5**	**-**	**-**	**9**	-	**9**	22.5 %
Non Scholastic	**-**	**-**	**-**	**-**	-		**5**	**5**	12.5 %

Total	**10**	**10**	**5**	**5**	**5**	**35**	**5**	**40**	**100 %**

End Semester - PG

Levels	Section A 10 Mks	Section B 20 Mks.	Section C 10 Mks	Section D 10 Mks.	Section E 10 Mks.	Total 60Mks.	
K2	**10**	**5**	**-**	**-**	**-**	**15**	25 %
K3	**-**	**5**	**10**	**-**	**-**	**15**	25 %
K4	**-**	**5**	**-**	**-**	**10**	**15**	25 %
K5	**-**	**5**	**-**	**10**	**-**	**15**	25 %
Total	**10**	**20**	**10**	**10**	**10**	**60**	**100 %**

CIA

Scholastic	**35**
Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	**C2**	**C3**	**C4**	**C5**	**C6**	**CIA**	**ESE**	**Total**
10	**10**	**5**	**5**	**5**	**5**	**40**	**60**	**100**

- **PG CIA Components**

			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks

C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	2 *	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Seminar	1	-	5 Mks
C6	-	Attendance		-	5 Mks

****The best out of two will be taken into account***

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	To understand the basic concepts in R- Programming.	K2	PSO1,PSO2
CO 2	Illustrate various statements used in R-Programming	K2, K3	PSO3, PSO5
CO 3	Analyze various techniques to import and export the data set.	K3,K4	PSO5, PSO6
CO 4	To know about the aggregate functions.	K4, K5	PSO6, PSO7
CO 5	Implementation of R-Progamming in current scenario	K4,K5	PSO8, PSO9

Mapping COs Consistency with PSOs

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3	3	1	1	1	1	1	1	1
CO2	1	1	3	1	3	1	1	1	1
CO3	2	1	1	1	3	3	1	1	1
CO4	1	1	1	2	1	3	3	1	1
CO5	1	1	2	1	2	1	1	3	3

Mapping of C0s with Pos

CO/ PSO	PO1	PO2	PO3	PO4
CO1	3	2	1	1
CO2	3	2	1	1
CO3	3	2	1	1
CO4	3	2	1	1
CO5	3	2	1	1

Note: Strongly Correlated – **3** Moderately Correlated – **2**

 Weakly Correlated -**1**

COURSE DESIGNER:

1. **V. Mageshwari**

Forwarded By

V. Mageshwari

HOD'S Signature & Name

I M.Sc.IT

SEMESTER –II

For those who joined in 2021 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	21PG2IT7	DATA SCIENCE	Lecture	4	4

COURSE DESCRIPTION

This course emphasizes learning various concepts in data science.

COURSE OBJECTIVES

To provide strong foundation for data science and application area related to it and understand the underlying core concepts and emerging technologies in data science.

UNITS

UNIT –I INTRODUCTION (12 HRS.)

Big Data and Data Science Hype – Why data science – Getting Past the Hype – The Current Landscape – Data Scientist - Data Science Process Overview – Defining goals – Retrieving data – Data preparation – Data exploration – Data modeling – Presentation.

UNIT –II: BIG DATA (12 HRS.)

Problems when handling large data – General techniques for handling large data – Case study – Steps in big data – Distributing data storage and processing with Frameworks – Case study.

UNIT –III: MACHINE LEARNING (12 HRS.)

Machine learning – Modeling Process – Training model – Validating model – Predicting new observations –Supervised learning algorithms – Unsupervised learning algorithms.

UNIT –IV : DEEP LEARNING (12 HRS.)

Introduction – Deep Feedforward Networks – Regularization – Optimization of Deep Learning – Convolutional Networks – Recurrent and Recursive Nets – Applications of Deep Learning.

UNIT –V: DATA VISUALIZATION, ETHICS AND RECENT TRENDS

(11 HRS.)

Introduction to data visualization – Data visualization options – Filters – MapReduce – Dashboard development tools – Creating an interactive

dashboard with dc.js-summary.Data Science Ethics – Doing good data science – Owners of the data - Valuing different aspects of privacy - Getting informed consent - The Five Cs – Diversity – Inclusion – Future Trends.

UNIT –VI: DYNAMISM (Evaluation Pattern-CIA only) (1 HRS.)

Data Science Ethics

TEXT BOOK:

1. Introducing Data Science, Davy Cielen, Arno D. B. Meysman, Mohamed Ali, Manning Publications Co., 1st edition, 2016
   Unit I – Chapter 1,2
   Unit II – Chapter 4,5
   Unit III – Chapter 3
   Unit V – Chapter 9

2. Deep Learning, Ian Goodfellow, YoshuaBengio, Aaron Courville, MIT Press, 1st edition, 2016
   Unit IV – Chapter 6, 7
3. Ethics and Data Science, D J Patil, Hilary Mason, Mike Loukides, O' Reilly, 1st edition, 2018 Unit V – Chapter 1,3,4

REFERENCE BOOK:

1. Data Science from Scratch: First Principles with Python, Joel Grus, O'Reilly, 1st edition, 2015
2. Doing Data Science, Straight Talk from the Frontline, Cathy O'Neil, Rachel Schutt, O' Reilly, 1st edition, 2013
3. Mining of Massive Datasets, Jure Leskovec, Anand Rajaraman, Jeffrey David Ullman, Cambridge University Press, 2nd edition, 2014

Digital Open Educational Resources (DOER) :

1) https://www.javatpoint.com/data-science

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 INTRODUCTION				
1.1	Big Data and Data Science Hype	2	Discussion	Black Board
1.2	Why data science – Getting Past the Hype	2	Chalk & Talk	Black Board
1.3	The Current Landscape	2	Lecture	LCD
1.4	Data Scientist - Data Science Process Overview	2	Discussion	Google classroom
1.5	Defining goals – Retrieving data – Data preparation	2	Chalk & Talk	Black Board
1.6	Data exploration – Data modeling – Presentation.	2	Chalk & Talk	Black Board
UNIT -2 BIG DATA				
2.1	Problems when handling large data	2	Lecture	PPT & White board
2.2	General techniques for handling large data	2	Chalk & Talk	Green Board
2.3	Case study – Steps in big data	2	Chalk & Talk	Black Board
2.4	Distributing data storage and processing with Frameworks	2	Chalk & Talk	Black Board
2.5	Distributing data storage and processing with Frameworks	2	Chalk & Talk	Black Board
2.6	Case study.	2	Chalk & Talk	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT – 3 MACHINE LEARNING				
3.1	Machine learning	2	Discussion	PPT & White board
3.2	Modeling Process	2	Chalk &Talk	Green Board
3.3	Training model	2	Chalk & Talk	Black Board
3.4	Validating model	2	Chalk & Talk	Black Board
3.5	Predicting new observations – Supervised learning algorithms	2	Discussion	Black Board
3.6	Unsupervised learning algorithms.	2	Lecture	PPT & White board
UNIT – 4 DEEP LEARNING				
4.1	Introduction – Deep Feedforward Networks	2	Discussion	PPT &White board
4.2	Regularization	2	Chalk & Talk	Green Board
4.3	Optimization of Deep Learning	2	Chalk & Talk	Black Board
4.4	Convolutional Networks	2	Chalk & Talk	Black Board
4.5	Recurrent and Recursive Nets	2	Discussion	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
4.6	Applications of Deep Learning.	2	Lecture	Green Board
UNIT – 5 DATA VISUALIZATION, ETHICS AND RECENT TRENDS				
5.1	Introduction to data visualization – Data visualization options – Filters – MapReduce	2	Lecture	PPT & White board
5.2	Dashboard development tools – Creating an interactive dashboard with dc.js-summary	2	Chalk & Talk	Black Board
5.3	Data Science Ethics	2	Lecture	Black Board
5.4	Doing good data science – Owners of the data	2	Chalk & Talk	Black Board
5.5	Valuing different aspects of privacy - Getting informed consent	2	Chalk & Talk	Black Board
5.6	The Five Cs – Diversity – Inclusion – Future Trends.	2	Chalk & Talk	Black Board
UNIT –6 DYNAMISM				
6.1	Data Science Ethics	1	Discussion	Black Board

INTERNAL - PG

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment

	T1 10 Mks.	T2 10 Mks.	Seminar 5 Mks.	Assignment 5 Mks	OBT/PPT 5 Mks	35 Mks.	5 Mks.	40Mks.	
K2	**4**	**4**	**-**	**-**	**-**	**8**	-	**8**	20 %
K3	**2**	**2**	**-**	**5**	**-**	**9**	-	**9**	22.5 %
K4	**2**	**2**	**-**	**-**	**5**	**9**	-	**9**	22.5 %
K5	**2**	**2**	**5**	**-**	**-**	**9**	-	**9**	22.5 %
Non Scholastic	**-**	**-**	**-**	**-**	-		**5**	**5**	12.5 %
Total	**10**	**10**	**5**	**5**	**5**	**35**	**5**	**40**	**100 %**

End Semester - PG

Levels	Section A 10 Mks	Section B 20 Mks.	Section C 10 Mks	Section D 10 Mks.	Section E 10 Mks.	Total 60Mks.	
K2	**10**	**5**	**-**	**-**	**-**	**15**	25 %
K3	**-**	**5**	**10**	**-**	**-**	**15**	25 %
K4	**-**	**5**	**-**	**-**	**10**	**15**	25 %
K5	**-**	**5**	**-**	**10**	**-**	**15**	25 %
Total	**10**	**20**	**10**	**10**	**10**	**60**	**100 %**

CIA

Scholastic	**35**

Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	**C2**	**C3**	**C4**	**C5**	**C6**	**CIA**	**ESE**	**Total**
10	**10**	**5**	**5**	**5**	**5**	**40**	**60**	**100**

- **PG CIA Components**

			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	2 *	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Seminar	1	-	5 Mks
C6	-	Attendance		-	5 Mks

****The best out of two will be taken into account***

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Understand the fundamental concepts of data science	K2	PSO1&PSO2

CO 2	Evaluate the data analysis techniques for applications handling large data	K2, K4	PSO3
CO 3	Demonstrate the various machine learning algorithms used in data science process	K2	PSO5&PSO6
CO 4	Understand the ethical practices of data science.	K4, K6	PSO4
CO 5	Learn to think through the ethics surrounding privacy, data sharing and algorithmic decision-making	K4	PSO8

Mapping of C0s with PSOs

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3	3	1	1	1	1	1	1	1
CO2	1	1	3	1	1	1	1	1	1
CO3	2	1	1	1	3	3	1	1	1
CO4	1	1	1	3	1	1	1	1	1
CO5	1	1	2	1	2	1	1	3	2

Mapping of COs with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	3	2	1	1
CO2	3	2	1	1
CO3	3	2	1	1
CO4	3	2	1	1
CO5	3	2	1	1

Note: Strongly Correlated – **3** Moderately Correlated – **2**

 Weakly Correlated -**1**

COURSE DESIGNER:

1. **Staff Name: Dr. V. Jane Varamani Sulekha**

Forwarded By

V. Mageshwari

HOD'S Signature & Name

II M.Sc.

SEMESTER IV

SELF STUDY PAPER

For those who joined in 2021 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	21PG4IT16	BIOMETRICS	PG Core	-	4

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS

COURSE DESCRIPTION

Biometrics plays a vital role in Data protection in current scenario.This course facilitates the students to know the basic principles of biometric technology.

COURSE OBJECTIVES

To understand the basic concepts of Biometrics and its applications.

UNITS

UNIT I : INTRODUCTION

How Authentication Technologies Work – How Biometrics Work.

UNIT II: TYPES

Fingerprint and Hand Geometry – Facial and Voice Recognition

UNIT III: EYE BIOMETICS

Eye Biometrics: Iris and Retina Scanning – Signature Recognition and Keystroke Dynamics.

UNIT IV: ESOTERIC BIOMETRICS

Esoteric Biometrics – Features - characteristics

UNIT V: EVALUATION

Biometrics in Large Scale Systems – Biometric Testing and Evaluation.

TEXT BOOK:

1. John D.Woodward, Jr, Nicholas M.Orlans, Peter T. Higgins, **Biometrics – The Ultimate Reference**, Dream Tech Publishers, New Delhi, 2003.

Unit I Chapters - 1, 2

Unit II Chapters - 3, 4

Unit III Chapters - 5, 6

Unit IV Chapters - 7

Unit V Chapters - 9, 11

REFERENCE BOOK:

1. Paul Reid, **Biometrics for Network Security**, Prentice Hall Series in Computer

Networking and Distributed, New Delhi, 2004.

2. James L. Wayman (Editor), Anil Jain (Editor), DavideMaltoni , Dario Maio,

Biometric Systems: Technology, Design and Performance Evaluation, Springer Publications, London, 2005.

I M.Sc.IT

SEMESTER –II

For those who joined in 2021 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	21PG2ITE1	ADHOC NETWORK	Lecture	4	5

COURSE DESCRIPTION

This course provides architecture and protocols of ad hoc wireless networks

COURSE OBJECTIVES

This course is aimed to Analyze the components of ad hoc network showing how wireless technology exists.

UNITS

UNIT I : INTRODUCTION [12 Hrs]

Fundamentals of Wireless Communication Technology – The Electromagnetic Spectrum – Radio propagation Mechanisms – Characteristics of the Wireless Channel – Ad-hoc wireless network : Introduction- Issues in Ad Hoc Wireless networks

UNIT II: MAC PROTOCOLS FOR AD HOC WIRELESS NETWORKS [12 Hrs]

Issues in designing a MAC Protocol- Classification of MAC Protocols- Contention based protocols-Contention based protocols with Reservation Mechanisms- Contention based protocols with Scheduling Mechanisms.

UNIT III :ROUTING PROTOCOLS for AD HOC WIRELESS NETWORKS

[12Hrs]

Issues in designing a Routing protocol for Ad hoc wireless networks- Classification of routing protocol – Table-driven routing protocol - On-demand Routing protocol -Hybrid routing

UNIT IV : TRANSPORT LAYER AND SECURITY PROTOCOLS [12 Hrs]

TCP over Ad hoc Wireless network – other Transport layer protocol for adhoc wireless network – Security in ad hoc wireless network – network security requirements – Issues and challenges in Security Provisioning- network security attacks – Secure routing in Ad-hoc wireless network.

UNIT V : WIRELESS SENSOR NETWORK [10 Hrs]

Introduction – Sensor Network Architecture – Data Dissemination – Data Gathering – MAC protocols for Sensor networks – Location Discovery – Quality of sensor network – other issues

UNIT –VI DYNAMISM (Evaluation Pattern-CIA only) (2 Hrs)

Recent Trends in Ad Hoc

TEXTBOOK

" Ad Hoc Wireless Network – Architecture and Protocols ", by C. Siva Ram Murthy , B.S. Manoj, Pearson Education Inc., 2014.

REFERENCE BOOKS

1. Barrie Sosinsky, "Cloud Computing Bible", Wiley Publishing, New Delhi, 2014.

2. Ray Rafaels, "Cloud Computing: From Beginning to End", Create Space Independent Publishing Platform, New Delhi, 2015.

Digital Open Educational Resources (DOER) :

https://www.tutorialspoint.com/what-is-ad-hoc-network

COURSE CONTENTS & LECTURE SCHEDULE

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1INTRODUCTION				
1.1	Fundamentals of Wireless Communication Technology	3	Discussion	Black Board
1.2	The Electromagnetic Spectrum – Radio propagation Mechanisms	3	Chalk & Talk	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
1.3	Characteristics of the Wireless Channel – Ad-hoc wireless network	3	Lecture	LCD
1.4	Introduction- Issues in Ad Hoc Wireless networks	3	Discussion	Google classroom
UNIT -2 MAC PROTOCOLS FOR AD HOC WIRELESS NETWORKS				
2.1	Issues in designing a MAC Protocol	3	Lecture	PPT & White board
2.2	Classification of MAC Protocols	3	Chalk & Talk	Green Board
2.3	Contention based protocols- Contention based protocols with Reservation Mechanisms	3	Chalk & Talk	Black Board
2.4	Contention based protocols with Scheduling Mechanisms	3	Chalk & Talk	Black Board
UNIT – 3 ROUTING PROTOCOLS for AD HOC WIRELESS NETWORKS				
3.1	Issues in designing a Routing protocol for Ad hoc wireless networks	3	Discussion	PPT & White board
3.2	Classification of routing protocol	3	Chalk &Talk	Green Board
3.3	Table-driven routing protocol	3	Chalk & Talk	Black Board
3.4	On-demand Routing protocol - Hybrid routing	3	Chalk & Talk	Black Board
UNIT – 4 TRANSPORT LAYER AND SECURITY PROTOCOLS				

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
4.1	TCP over Ad hoc Wireless network – other Transport layer protocol for adhoc wireless network	3	Discussion	PPT & White board
4.2	Security in ad hoc wireless network – network security requirements	3	Chalk & Talk	Green Board
4.3	Issues and challenges in Security Provisioning- network security attacks	3	Chalk & Talk	Black Board
4.4	Secure routing in Ad-hoc wireless network.	3	Chalk & Talk	Black Board
UNIT – 5 WIRELESS SENSOR NETWORK				
5.1	Introduction – Sensor Network Architecture	3	Lecture	PPT & White board
5.2	Data Dissemination – Data Gathering	2	Chalk & Talk	Black Board
5.3	MAC protocols for Sensor networks – Location Discovery – Quality of sensor network	3	Lecture	Black Board
5.4	other issue	2	Chalk & Talk	Black Board
UNIT –6 DYNAMISM				
6.1	Recent Trends	2	Discussion	Black Board

INTERNAL - PG

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1	T2	Seminar	Assignment	OBT/PPT				
	10 Mks.	10 Mks.	5 Mks.	5 Mks	5 Mks	35 Mks.	5 Mks.	40Mks.	
K2	4	4	-	-	-	8	-	8	20 %
K3	2	2	-	5	-	9	-	9	22.5 %
K4	2	2	-	-	5	9	-	9	22.5 %
K5	2	2	5	-	-	9	-	9	22.5 %
Non Scholastic	-	-	-	-	-		5	5	12.5 %
Total	10	10	5	5	5	35	5	40	100 %

End Semester - PG

Levels	Section A	Section B	Section C	Section D	Section E	Total	
	10 Mks	20 Mks.	10 Mks	10 Mks.	10 Mks.	60Mks.	
K2	10	5	-	-	-	15	25 %
K3	-	5	10	-	-	15	25 %
K4	-	5	-	-	10	15	25 %
K5	-	5	-	10	-	15	25 %
Total	10	20	10	10	10	60	100 %

CIA

Scholastic	**35**

Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	**C2**	**C3**	**C4**	**C5**	**C6**	**CIA**	**ESE**	**Total**
10	**10**	**5**	**5**	**5**	**5**	**40**	**60**	**100**

- **PG CIA Components**

			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	2 *	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Seminar	1	-	5 Mks
C6	-	Attendance		-	5 Mks

****The best out of two will be taken into account***

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Understand the design issues in ad hoc and sensor networks	K2	PSO1, PSO2 & PSO3
CO 2	Learn the different types of MAC protocols	K2,K4	PSO4, PSO5 & PSO6
CO 3	Be familiar with different types of adhoc routing protocols.	K3	PSO8 & PSO9
CO 4	Be expose to the TCP issues in adhoc networks	K3	PSO4, PSO5 & PSO6
CO 5	Learn the architecture and protocols of wireless sensor networks	K4	PSO5, PSO8 & PSO9

Mapping COs Consistency with PSOs

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3	3	3	1	1	1	1	1	1
CO2	1	1	2	3	3	3	1	1	1
CO3	2	1	1	1	2	2	1	3	3
CO4	1	1	1	3	3	3	1	1	1
CO5	1	1	2	1	3	1	1	3	3

Mapping of C0s with Pos

CO/ PSO	PO1	PO2	PO3	PO4
CO1	3	2	1	1

CO2	**3**	**2**	**1**	**1**
CO3	**3**	**2**	**1**	**1**
CO4	**3**	**2**	**1**	**1**
CO5	**3**	**2**	**1**	**1**

Note: Strongly Correlated – **3** Moderately Correlated – **2**

 Weakly Correlated -**1**

COURSE DESIGNER: Mrs. V. Mageshwari

Forwarded By

V. Mageshwari

HOD'S Signature & Name

SEMESTER –II

For those who joined in 2021 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	21PG2ITE2	MACHINE LEARNING	Lecture	4	5

COURSE DESCRIPTION

This course emphasizes learning algorithms and theory including concept, decision tree, neural network, computational, Bayesian, instant and advanced learning.

COURSE OBJECTIVES

To facilitate the student to understand Machine Learning Techniques and applications.

UNITS

UNIT –I INTRODUCTION (12 HRS.)

Learning Problems – Perspectives and Issues – Concept Learning – Version Spaces and Candidate Eliminations – Inductive bias – Decision Tree learning – Representation – Algorithm – Heuristic Space Search.

UNIT –II: NEURAL NETWORKS AND GENETIC ALGORITHMS (12 HRS.)

Representation – Problems – Perceptrons – Multilayer Networks and Back Propagation Algorithms – Advanced Topics – Genetic Algorithms – Hypothesis Space Search – Genetic Programming – Models of Evaluation and Learning.

UNIT –III: BAYESIAN AND COMPUTATIONAL LEARNING (12 HRS.)

Bayes Theorem –Concept Learning – Maximum Likelihood – Minimum Description Length Principle– Bayes Optimal Classifier – Gibbs Algorithm – Naïve Bayes Classifier – Bayesian Belief Network – EM Algorithm – Probability

Learning – Sample Complexity – Finite and Infinite Hypothesis Spaces – Mistake Bound Model.

UNIT –IV :INSTANT BASED LEARNING (12 HRS.)

K- Nearest Neighbour Learning – Locally weighted Regression – Radial Basis Functions – Case Based Learning.

UNIT –V: ADVANCED LEARNING (11 HRS.)

Learning Sets of Rules – Sequential Covering Algorithm – Learning Rule Set – First Order Rules – Sets of First Order Rules – Induction on Inverted Deduction – Inverting Resolution – Analytical Learning – Perfect Domain Theories – Explanation Base Learning – FOCL Algorithm – Reinforcement Learning– Task – Q-Learning – Temporal Difference Learning

UNIT –VI: DYNAMISM (Evaluation Pattern-CIA only) (1 HRS.)

Temporal Difference Learning

TEXT BOOK:

1. Tom M. Mitchell, ―Machine Learning, McGraw-Hill Education (India) Private Limited, 2013.

REFERENCE BOOK:

1. EthemAlpaydin, ―Introduction to Machine Learning (Adaptive Computation and Machine Learning), The MIT Press 2004.
2. Stephen Marsland, ―Machine Learning: An Algorithmic Perspective, CRC Press, 2009.
3. Michael Affenzeller, Stephan Winkler, Stefan Wagner, Andreas Beham,
4. Genetic Algorithms and Genetic Programming‖, CRC Press Taylor and Francis Group.

Digital Open Educational Resources (DOER) :

1. https://www.javatpoint.com/machine-learning

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1INTRODUCTION				
1.1	Learning Problems – Perspectives and Issues – Concept Learning	3	Discussion	Black Board
1.2	Version Spaces and Candidate Eliminations	3	Chalk & Talk	Black Board
1.3	Inductive bias – Decision Tree learning – Representation	3	Lecture	LCD
1.4	Algorithm – Heuristic Space Search.	3	Discussion	Google classroom
UNIT -2NEURAL NETWORKS AND GENETIC ALGORITHMS				
2.1	Representation – Problems – Perceptrons	3	Lecture	PPT & White board
2.2	Multilayer Networks and Back Propagation Algorithms – Advanced Topics	3	Chalk & Talk	Green Board
2.3	Genetic Algorithms – Hypothesis Space Search	3	Chalk & Talk	Black Board
2.4	Genetic Programming – Models of Evaluation and Learning.	3	Chalk & Talk	Black Board
UNIT – 3 BAYESIAN AND COMPUTATIONAL LEARNING				
3.1	Bayes Theorem –Concept Learning – Maximum Likelihood	3	Discussion	PPT & White board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
3.2	Minimum Description Length Principle– Bayes Optimal Classifier – Gibbs Algorithm	3	Chalk &Talk	Green Board
3.3	Naïve Bayes Classifier – Bayesian Belief Network – EM Algorithm – Probability Learning	3	Chalk & Talk	Black Board
3.4	Sample Complexity – Finite and Infinite Hypothesis Spaces – Mistake Bound Model.	3	Chalk & Talk	Black Board
UNIT – 4 INSTANT BASED LEARNING				
4.1	K- Nearest Neighbour Learning	3	Discussion	PPT & White board
4.2	Locally weighted Regression	3	Chalk & Talk	Green Board
4.3	Radial Basis Functions	3	Chalk & Talk	Black Board
4.4	Case Based Learning.	3	Chalk & Talk	Black Board
UNIT – 5 ADVANCED LEARNING				
5.1	Learning Sets of Rules – Sequential Covering Algorithm – Learning Rule Set – First Order Rules	3	Lecture	PPT & White board
5.2	Sets of First Order Rules – Induction on Inverted Deduction – Inverting Resolution	2	Chalk & Talk	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
5.3	Analytical Learning – Perfect Domain Theories – Explanation Base Learning – FOCL Algorithm	3	Lecture	Black Board
5.4	Reinforcement Learning–Task – Q-Learning – Temporal Difference Learning	2	Chalk & Talk	Black Board
UNIT –6 DYNAMISM				
6.1	Recent Trends	2	Discussion	Black Board

INTERNAL - PG

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1	T2	Seminar	Assignment	OBT/PPT				
	10 Mks.	10 Mks.	5 Mks.	5 Mks	5 Mks	35 Mks.	5 Mks.	40Mks.	
K2	**4**	**4**	**-**	**-**	**-**	**8**	-	**8**	20 %
K3	**2**	**2**	**-**	**5**	**-**	**9**	-	**9**	22.5 %
K4	**2**	**2**	**-**	**-**	**5**	**9**	-	**9**	22.5 %
K5	**2**	**2**	**5**	**-**	**-**	**9**	-	**9**	22.5 %
Non Scholastic	**-**	**-**	**-**	**-**	-		**5**	**5**	12.5 %
Total	**10**	**10**	**5**	**5**	**5**	**35**	**5**	**40**	**100 %**

End Semester - PG

Levels	Section A 10 Mks	Section B 20 Mks.	Section C 10 Mks	Section D 10 Mks.	Section E 10 Mks.	Total 60Mks.	
K2	10	5	-	-	-	15	25 %
K3	-	5	10	-	-	15	25 %
K4	-	5	-	-	10	15	25 %
K5	-	5	-	10	-	15	25 %
Total	10	20	10	10	10	60	100 %

CIA

Scholastic	**35**
Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	C6	CIA	ESE	Total
10	10	5	5	5	5	40	60	100

- **PG CIA Components**

			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks

C3	-	Assignment	2 *	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Seminar	1	-	5 Mks
C6	-	Attendance		-	5 Mks

****The best out of two will be taken into account***

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	understand the fundamental issues and challenges of machine learning concept	K2	PSO1& PSO2
CO 2	Understand, Analyse and identify the strengths and weaknesses of many popular machine-learning approaches.	K2, K4	PSO3
CO 3	Aware about the underlying mathematical relationships across Machine Learning algorithms and the paradigms of supervised and un-supervised learning.	K2	PSO5 & PSO6
CO 4	Ability to design and implement various machine learning algorithms in a range of real-world applications.	K4, K6	PSO4
CO 5	Perform evaluation of machine learning algorithms and model selection.	K4	PSO8

Mapping COs Consistency with PSOs

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3	3	1	1	1	1	1	1	1
CO2	1	1	3	1	1	1	1	1	1
CO3	2	1	1	1	3	3	1	1	1
CO4	1	1	1	3	1	1	1	1	1
CO5	1	1	2	1	2	1	1	3	2

Mapping of COs with Pos

CO/ PSO	PO1	PO2	PO3	PO4
CO1	3	2	1	1
CO2	3	2	1	1
CO3	3	2	1	1
CO4	3	2	1	1
CO5	3	2	1	1

Note: Strongly Correlated – **3** Moderately Correlated – **2**

 Weakly Correlated -**1**

COURSE DESIGNER:Dr. V. Jane Varamani sulekha

Forwarded By

V. Mageshwari

HOD'S Signature & Name

I M.Sc.IT

SEMESTER –II

For those who joined in 2021 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	21PG2ITE3	CYBER SECURITY	Lecture	4	5

COURSE DESCRIPTION

Cyber Security courses aims to equip students with the knowledge and skills required to defend the computer operating systems, networks and data from cyber-attacks.

COURSE OBJECTIVES

The learner will gain knowledge about securing both clean and corrupted systems, protect personal data, and secure computer networks.

UNITI : INTRODUCTION TO CYBER SECURITY [12 Hrs]

Overview of Cyber Security, Internet Governance – Challenges and Constraints, Cyber Threats:- Cyber Warfare-Cyber Crime-Cyber terrorism-Cyber Espionage, Need for a Comprehensive Cyber Security Policy, Need for a Nodal Authority, Need for an International convention on Cyberspace.

UNIT II :CYBER SECURITY VULNERABILITIES AND SAFEGUARDS

[12 Hrs]

Cyber Security Vulnerabilities-Overview, vulnerabilities in software, System administration, Complex Network Architectures, Open Access to Organizational Data, Weak Authentication, Unprotected Broadband communications, Poor Cyber Security Awareness. Cyber Security Safeguards-Overview, Access control, Audit, Authentication, Biometrics, Cryptography, Deception, Denial of Service Filters, Ethical Hacking, Firewalls, Intrusion Detection Systems, Response, Scanning, Security policy, Threat Management.

UNIT III : SECURING WEB APPLICATION, SERVICES AND SERVERS [12 Hrs]

Introduction, Basic security for HTTP Applications and Services, Basic Security for SOAP Services, Identity Management and Web Services, Authorization Patterns, Security Considerations, Challenges.

UNIT IV : INTRUSION DETECTION AND PREVENTION [12 Hrs]

Intrusion, Physical Theft, Abuse of Privileges, Unauthorized Access by Outsider, Malware infection, Intrusion detection and Prevention Techniques, Anti-Malware software, Network based Intrusion detection Systems, Network based Intrusion Prevention Systems, Host based Intrusion prevention Systems, Security Information Management, Network Session Analysis, System Integrity Validation.

UNIT V : CYBER LAW &CYBER FORENSICS [12 Hrs]

Introduction, Cyber Security Regulations, Roles of International Law, the state and Private Sector in Cyberspace, Cyber Security Standards. The INDIAN Cyberspace, National Cyber Security Policy 2013.((Self Study)

Introduction to Cyber Forensics, Handling Preliminary Investigations, Controlling an Investigation, Conducting disk-based analysis, Investigating

Information-hiding, Scrutinizing E-mail, Validating E-mail header information, Tracing Internet access, Tracing memory in real-time.

TEXT BOOK

1. "Fundamental Of Cyber Security – Principles,Theory and Practices" by Mayank Bhushan ,Rajkumar Singh Rathore , Aatif Jamshed , BPB Publications, ISBN: 9789386551559, 9789386551559

REFERENCE BOOKS

1." Cyber Security & IT infrastructure Protection" 1st Edition, by John Vacca, Syngress Publisher

2. Cyber Security and Cyber Lawsby Alfred Basta ,Nadine Basta ,Mary Brown , Ravinder Kumar, Cengage Learning India Private Limited Publisher (2018)

Digital Open Educational Resources (DOER) :

1. https://searchsecurity.techtarget.com/definition/cybersecurity
2. https://www.tutorialspoint.com/computer_security/index.htm

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1	**INTRODUCTION TO CYBER SECURITY**			
1.1	Overview of Cyber Security, Internet Governance –	3	Chalk & Talk	Black Board
1.2	Challenges and Constraints, Cyber Threats:- Cyber Warfare-Cyber Crime- for a Nodal Authority, Need for an	3	Chalk & Talk	LCD

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
	International convention on Cyberspace.			
1.3	Cyber terrorism-Cyber Espionage,	3	Lecture	Smart Board
1.4	Need for a Comprehensive	1	Lecture	Smart Board
1.5	Cyber Security Policy, Need	2	Discussion	Google classroom
UNIT -2 CYBER SECURITY VULNERABILITIES AND SAFEGUARDS				
2.1	Cyber Security Vulnerabilities-Overview, vulnerabilities in software, System administration, Complex Network Architectures, Open Access to Organizational Data, Weak Authentication, Unprotected Broadband communications, Poor Cyber Security Awareness.	4	Chalk & Talk	LCD
2.2	Cyber Security Safeguards-Overview, Access control, Audit, Authentication, Biometrics,	4	Lecture	Smart Board
2.3	Cryptography, Deception, Denial of Service Filters, Ethical Hacking, Firewalls, Intrusion Detection Systems, Response, Scanning, Security policy, Threat Management.	4	Discussion	Google classroom
UNIT -3 SECURING WEB APPLICATION, SERVICES AND SERVERS				
3.1	Introduction, Basic security for HTTP Applications and Services.	4	Lecture	Green Board Charts

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
3.2	Basic Security for SOAP Services, Identity Management and Web.	4	Chalk & Talk	Green Board
3.3	Services, Authorization Patterns, Security Considerations, Challenges	4	Chalk & Talk	Black Board
UNIT -4 INTRUSION DETECTION AND PREVENTION				
4.1	Intrusion, Physical Theft, Abuse of Privileges,	3	Chalk & Talk	LCD
4.2	Unauthorized Access by Outsider, Malware infection, Intrusion detection and Prevention Techniques, Anti-	4	Chalk & Talk	Black Board
4.3	Malware software, Network based Intrusion detection Systems, Network based Intrusion Prevention Systems, Host based Intrusion prevention Systems, Security Information Management,	3	Lecture	Smart Board
4.4	Network Session Analysis, System Integrity Validation.	2	Discussion	Google classroom
UNIT -5 CYBER LAW & CYBER FORENSICS				
5.1	Introduction, Cyber Security Regulations, Roles of International Law, the state and Private Sector in Cyberspace,	3	Chalk & Talk	Black Board
5.2	Cyber Security Standards. The INDIAN Cyberspace, National Cyber Security Policy 2013.	3	Lecture	Smart Board
5.3	Introduction to Cyber Forensics, Handling	3	Chalk & Talk	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
	Preliminary Investigations, Controlling an Investigation, Conducting disk-based analysis,			
5.4	Investigating Information-hiding, Scrutinizing E-mail, Validating E-mail header information, Tracing Internet access, Tracing memory in real-time.	3	Discussion	Google classroom
UNIT -6 DYNAMISM				
6.1	Tracing memory in real-time.	4	Discussion	Black board

INTERNAL - PG

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1 10 Mks.	T2 10 Mks.	Seminar 5 Mks.	Assignment 5 Mks	OBT/PPT 5 Mks	35 Mks.	5 Mks.	40Mks.	
K2	**4**	**4**	**-**	**-**	**-**	**8**	-	**8**	20 %
K3	**2**	**2**	**-**	**5**	**-**	**9**	-	**9**	22.5 %
K4	**2**	**2**	**-**	**-**	**5**	**9**	-	**9**	22.5 %
K5	**2**	**2**	**5**	**-**	**-**	**9**	-	**9**	22.5 %
Non Scholastic	**-**	**-**	**-**	**-**	-		**5**	**5**	12.5 %

Total	**10**	**10**	**5**	**5**	**5**	**35**	**5**	**40**	**100 %**

End Semester - PG

Levels	Section A 10 Mks	Section B 20 Mks.	Section C 10 Mks	Section D 10 Mks.	Section E 10 Mks.	Total 60Mks.	
K2	**10**	**5**	**-**	**-**	**-**	**15**	25 %
K3	**-**	**5**	**10**	**-**	**-**	**15**	25 %
K4	**-**	**5**	**-**	**-**	**10**	**15**	25 %
K5	**-**	**5**	**-**	**10**	**-**	**15**	25 %
Total	**10**	**20**	**10**	**10**	**10**	**60**	**100 %**

CIA

Scholastic	**35**
Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	**C2**	**C3**	**C4**	**C5**	**C6**	**CIA**	**ESE**	**Total**
10	**10**	**5**	**5**	**5**	**5**	**40**	**60**	**100**

- **PG CIA Components**

Nos

C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	2 *	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Seminar	1	-	5 Mks
C6	-	Attendance		-	5 Mks

****The best out of two will be taken into account***

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Analyze and evaluate the cyber security needs of an organization.	K2	PSO1, PSO4
CO 2	Measure the performance and troubleshoot cyber security systems..	K2, K3	PSO2, PSO5
CO 3	Comprehend and execute risk management processes, risk treatment methods, and key risk and performance indicators g	K3, K4	PSO5, PSO6
CO 4	Design and develop a security architecture for an organization.	K3, K4	PSO3, PSO6
CO 5	Design operational and strategic cyber security strategies and policies.	K4, K5	PSO6, PSO8

Mapping COs Consistency with PSOs

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3	2	1	3	1	1	1	1	1
CO2	1	3	2	1	3	1	1	1	1
CO3	2	1	1	1	3	3	1	1	1
CO4	1	1	3	2	1	3	1	1	1
CO5	1	1	2	1	2	3	1	3	1

Mapping of COs with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	3	2	1	1
CO2	3	2	1	1
CO3	3	2	1	1
CO4	3	2	1	1
CO5	3	2	1	1

Note: Strongly Correlated – **3** Moderately Correlated – **2**

 Weakly Correlated -**1**

COURSE DESIGNER:

1. **Staff Name: V. Mageshwari**

Forwarded By

V. Mageshwari

HOD'S Signature & Name

II M.Sc.

SEMESTER III

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	21PG3ITE5	ETHICAL HACKING	PG Core	5	5

COURSE DECSCRIPTION

This course includes finding and attempting to exploit any vulnerabilities to determine whether unauthorized access or other malicious activities are possible.

COURSE OBJECTIVES

The purpose of ethical hacking is to evaluate the security of and identify vulnerabilities in systems, networks or system infrastructure

UNITS

UNIT I:INTRODUCTION

Introduction to ethical hacking- Fundamentals of computer networking.

UNIT-II : PROTOCOLS

Key exchange protocols - cryptographic hash functions- applications.

UNIT-III :AUTHENTICATION

Steganography, biometric authentication.

UNIT IV: TYPES OF ATTACKS

ARP poisoning, DNS poisoning. Hacking wireless networks, Denial of service attacks.

UNIT V: **SECURITY**

Elements of hardware security: side-channel attacks .

REFERENCES:

1. 'Hacking – the art of Exploitation", by Zenk , second edition,

WEB REFERNCES :

1. http://repo.zenk-security.com
2. https://nptel.ac.in/courses/106/105/106105217/

II M.Sc.,

SEMESTER –III

For those who joined in 2021 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	**21PG3ITE6**	**COMPUTER FORENSICS**	**PG Core**	**5Hrs.**	**5**

COURSE DESCRIPTION

This course includes finding and attempting to analyze various activities related to computer forensic evidence.

COURSE OBJECTIVES

To Identify the essential and up-to-date concepts, algorithms, protocols, tools, and methodology of Computer Forensics

UNITS

UNIT I : INTRODUCTION (14 Hrs)

Introduction to Digital Forensics - Definition and types of cybercrimes - Electronic evidence and handling - Electronic media – collection - searching and storage of electronic media.

UNIT II : CYBER CRIMES (14 Hrs)

Introduction to internet crimes - Hacking and cracking - Credit card and ATM frauds - Web technology – Cryptography - Emerging Digital crimes and modules.

UNIT III : COMPUTER FORENSICS (14 Hrs)

Definition and Cardinal Rules - Data Acquisition and Authentication Process - Windows Systems-FAT12, FAT16, FAT32 and NTFS - UNIX file Systems, mac file systems - Computer artifacts - Internet Artifacts - OS Artifacts.

UNIT IV : FORENSIC TOOLS (14 Hrs)

Introduction to Forensic Tools - Usage of Slack space - Tools for Disk Imaging - Data Recovery - Vulnerability Assessment Tools - Encase and FTK tools - Anti Forensics and probable counters - Retrieving information.

UNIT IV : PROCESSING OF ELECTRONIC EVIDENCE (14 Hrs)

Process of computer forensics and Digital investigations: Processing of Digital evidence - Digital images - Damaged SIM and data recovery - Multimedia evidence - Retrieving deleted data: Desktops, Laptops and Mobiles - Retrieving data from slack space - Renamed file – Ghosting - Compressed files.

UNIT –VI DYNAMISM (Evaluation Pattern-CIA only) (5 HRS.)

Current scenario in Computer Forensic technologies

TEXT BOOKS:

C. Altheide & H. Carvey, “Digital Forensics with Open Source Tools”, Syngress, 2011. ISBN: 9781597495868.

REFERENCES :

E. Casey, “Digital Evidence and Computer Crime”, Third Edition, Academic Press, 2011.

OPEN EDUCATIONAL RESOURCES:

1. https://esu.desire2learn.com/
2. https://www.guru99.com/digital-forensics.html

INTER DEPARTMENTAL SELF LEARNING COURSE

DEPARTMENT OF IT AND Commerce with CA

I M.ComCA

SEMESTER –I

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSCC	21PGCASLIT1	SUPPLY CHAIN MANAGEMENT	Lecture		2

COURSE OBJECTIVES

To create awareness about the supply chain activities taken in order to deliver the goods

UNIT -I

Supply Chain Management – Global Optimization – importance – key issues – Inventory management – economic lot size model. Supply contracts – centralized vs. decentralized system

UNIT -II

Supply chain Integrates- Push, Pull strategies – Demand driven strategies – Impact on grocery industry – retail industry – distribution strategies

UNIT -III

Strategic Alliances: Frame work for strategic alliances – 3PL – merits and demerits – retailer – supplier partnership – advantages and disadvantages of RSP – distributor Integration

UNIT -IV

Procurement and Outsourcing: Outsourcing – benefits and risks – framework for make/buy decision – e-procurement – frame work of e-procurement

UNIT -V

Dimension of customer Value – conformance of requirement – product selection – price and brand – value added services – strategic pricing – smart pricing – customer value measures

TEXT BOOK:

1. Rushton, A., Oxley, J &Croucher, P, "Handbook of Logistics and Distribution Management", Kogan Page, 2nd Edition , 2007.

REFERENCE BOOKS:

1. Simchi-Levi, David, Kamisnsky, Philip, and Simchi-Levi, Edith, " Designing and Managing the supply chain concepts, strategies and case studies", 3rd Edition, 2008.
2. Irwin, "Designing and Managing the Supply Chain: Concepts, Strategies and Case Studies", McGraw Hill.2006.
3. R.B. Handfield and E.L. Nochols, "Introduction to Supply Chain Management", Prentice Hall, 2006.

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Explain the recent developments in the Indian financial system.	K2	PSO1,PSO2 & PSO 3

CO 2	Understand the fundamental concepts and working of financial service institutions.	K2, K3	PSO1,PSO2 , PSO3 & PSO 4
CO 3	Illustrate valuation of companies by venture capitalist.	K2, K4	PSO1,PSO2 , PSO 3 & PSO 6
CO 4	provide knowledge about the management of *mutual funds*	K2, K3 & K4	PSO1,PSO2 , & PSO 6
CO 5	Learn about stock market with Basics of Financial Markets	K3& K5	PSO1,PSO3 , & PSO5

Mapping COs Consistency with PSOs

CO/ PSO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	3	3	3	2	2	2
CO2	3	3	3	3	2	2
CO3	3	3	3	2	2	3
CO4	3	3	2	2	2	3
CO5	3	3	3	2	2	3

Mapping COs Consistency with POs

CO/ PO	PO1	PO2	PO3	PO4
CO1	3	3	2	2
CO2	3	3	2	2
CO3	3	3	2	2
CO4	3	3	2	2
CO5	3	3	2	2

COURSE DESIGNER:

1. **Mrs. Charanya Nagammai**
2. **Mrs. N. Jenifer Sharon Sumathi**

Forwarded By

V. Mageshwari

Head, B.Sc IT Department

Dr. M. Arasammal

Head, B.Com CA Department

II M.Sc.

SEMESTER –II

For those who joined in 2021 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	21PG2ITSL1	LINUX SHELL PROGRAMMING	PG Core	5 Hrs.	5

COURSE DESCRIPTION

Linux shell programming describes about the commands used to develop the concept of shell programming.

COURSE OBJECTIVES

To learn basics of shell programming and to develop programs that access files, to use signals, processes and threads

UNITS

UNIT I : SHELL PROGRAMMING: (14 Hrs)

In Introduction to Unix, Linux and GNU - Programming Linux - Shell – Pipes and Redirection – **The Shell as a Programming Language – Shell Syntax(Self Study)**

UNIT II WORKING WITH FILES: (14 Hrs)

Linux File Structure-System calls and Device Drivers-Library Functions- Low Level File Access-Standard I/O Library-Formatted Input and Output-File and Directory Maintenance-scanning Directories-Errors-**The /proc File System (Self Study)**

UNIT III :LINUX ENVIRONMENT & PROCESS AND SIGNALS (14 Hrs)

Program Arguments-Environment Variables-Time and Date-Temporary Files-User Information-Host Information-Logging-Resources and Limits-Process-Process Structure-**Starting New Processes – Signals(Self Study)**

UNIT IV: TERMINALS AND POSIX THREADS : (14 Hrs)

Reading from and Writing to the Terminal-Talking to the Terminal-The Terminal Driver and the General Terminal Interface-The Termios Structure-Terminal Output-Detecting Keystrokes- Thread - Advantages and Drawbacks of Thread- A First Threads Program-Simultaneous Execution-Synchronization -Thread Attributes- **Canceling a Thread-Threads in Abundance (Self Study)**

UNIT V : MANAGING TEXT-BASED SCREENS WITH CURSES: (14 Hrs)

Compiling with curses-Curses Terminology and Concepts - The Screen - The

Keyboard-Windows - Sub windows - The Keypad - Using Color – Pads - **The CD Collection Application (Self Study)**

UNIT –VI DYNAMISM (Evaluation Pattern-CIA only) (5 Hrs.)

Case study in latest Commands in Linux

REFERENCES:

1. Beginning Linux Programming, IV Edition– Neil Mathew, Richard Stones- Wiley India Pvt.Ltd-2008.
2. Professional Linux Programming, IV Edition - Richard Stones and Neil Matthew-Wiley India Pvt.Ltd-2008
3. Linux Complete, I Indian Edition - Grant Taylor- BPB publication-2000
4. Linux Application Development, II Edition - Michael K. Johnson and W.Troan- Pearson Education-2005.
5. Linux the Complete Reference, VI Edition–Richard Peterson-Tata McGraw Hill Edition-2008

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 SHELL PROGRAMMING				
1.1	In Introduction to Unix, Linux and GNU	3	Chalk & Talk	Black Board
1.2	Programming Linux - Shell – Pipes and Redirection	4	Chalk & Talk	LCD

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
1.3	The Shell as a Programming Language – Shell Syntax(Self Study)	7	Discussion	Google classroom
UNIT -2 WORKING WITH FILES				
2.1	Linux File Structure-System calls and Device Drivers-Library Functions	3	Lecture	Smart Board
2.2	Low Level File Access-Standard I/O Library-	3	Lecture	Black Board
2.3	Formatted Input and Output-File and Directory Maintenance-	4	Chalk & Talk	Black Board
2.4	scanning Directories-Errors-	3	Lecture	Smart Board
2.5	The /proc File System (Self Study)	1	Discussion	Google classroom
UNIT -3 LINUX ENVIRONMENT & PROCESS AND SIGNALS				
3.1	Program Arguments-Environment Variables-Time and Date-Temporary Files	4	Chalk & Talk	Green Board
3.2	User Information-Host Information-Logging-Resources and Limits-	4	Discussion	Black Board
3.3	Process- Process Structure	3	Lecture	Green Board Charts
3.4	Starting New Processes – Signals (Self Study)	3	Discussion	Google classroom
UNIT -4 TERMINALS AND POSIX THREADS				

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
4.1	Reading from and Writing to the Terminal-Talking to the Terminal	4	Chalk & Talk	Green Board
4.2	The Terminal Driver and the General Terminal Interface-The Termios Structure-Terminal Output	3	Chalk & Talk	Green Board
4.3	Detecting Keystrokes- Thread - Advantages and Drawbacks of Thread- A First Threads Program	3	Lecture	Smart Board
4.4	Simultaneous Execution-Synchronization -Thread Attributes	3	Chalk & Talk	Green Board
4.5	Canceling a Thread-Threads in Abundance(Self Study)	1	Discussion	Google classroom
UNIT -5	**MANAGING TEXT-BASED SCREENS WITH CURSES**			
5.1	Compiling with curses-Curses Terminology and Concepts	3	Lecture	Smart Board
5.2	The Screen - The Keyboard-Windows	4	Chalk & Talk	Green Board
5.3	Sub windows - The Keypad - Using Color – Pads	4	Chalk & Talk	Green Board
5.4	The CD Collection Application(Self Study)	3	Discussion	Google classroom
UNIT -6	**DYNAMISM**			
6.1	Case study in latest Commands in Linux	5	Discussion	Google classroom

Levels	C1	C2	C3	C4	Total Scholastic Marks	Non Scholastic Marks C5	CIA Total	% of Assessment
	Session - wise Average 5 Mks.	Better of W1, W2 5+5=10 Mks.	M1+M2 15 Mks	MID-SEM TEST 5 Mks	35 Mks.	5 Mks.	40Mks.	
K1	5	-	-	2 ½	-		-	-
K2	-	5	4	2 ½	5		5	12.5 %
K3	-	-	3	5	12		12	30 %
K4	-	-	3	5	9		9	22.5%
Non Scholastic	-	-	-	-	9		9	22.5 %
Total	5	5	10	15	35	5	40	100 %

CIA	
Scholastic	35
Non Scholastic	5
	40

EVALUATION PATTERN

SCHOLASTIC				NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	CIA	ESE	Total

SCHOLASTIC				NON - SCHOLASTIC	MARKS		
5	10	15	5	5	40	60	100

C1 – Average of Two Session Wise Tests

C2 – Average of Two Monthly Tests

C3 - Mid Sem Test

C4 – Best of Two Weekly Tests

C5 – Non - Scholastic

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Understand the fundamental concept of Shell Programming	K2	PSO1,PSO2
CO 2	Analyze the concepts of file management in Linux	K2, K3	PSO2,SPO3
CO 3	To learn the linux environment, process and signal	K2, K3	PSO4,PSO5
CO 4	Identify the types of POSIX threads and terminals	K3, K4	PSO3, PSO9
CO 5	Utilize the facilities provided in the concept of text based screens	K3, K5	PSO8, PSO9

COURSE DESIGNER:

Forwarded By

HOD'S Signature

& Name

II M.Sc.

SEMESTER –III

For those who joined in 2021 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	21PG3ITSL1	RESEARCH METHODOLOGY	PG Core	-	2

COURSE DESCRIPTION:

Research Methodology is a hands-on course designed to impart education in the foundational methods and techniques of academic research in social sciences and business management context.

COURSE OBJECTIVES :

Understand some basic concepts of research and its methodologies.

UNITS

UNIT I : INTRODUCTION TO RESEARCH METHODOLOGY

Definition – History – Evolution of Scientific Inquiry, Scientific Research: Definition,Characteristics, types, need of research.

UNIT II : SCIENCE AND RESEARCH:

Identification of the problem, assessing the status of the problem, formulating the objectives, preparing design.

UNIT III: TYPES OF RESEARCH

Meaning and importance of Research – Types of Research – Selection and formulation of Research Problem Research Design.

UNIT IV: DATA COLLECTION AND ANALYSIS

Sources of Data – Primary, Secondary and Teritary – Types of Data – Categorical nominal & Ordinal.

UNIT V: SCIENTIFIC WRITING

Types of Report – Technical-Reports and Thesis – Significance – Different steps in the preparation – Illustrations and tables – Bibliography.

TEXT BOOK:

Research Methodology, Dr P M Bulakh,Dr P. S. Patki and Dr A S Chodhary 2010 Published by Expert Trading Corporation Dahisar West, Mumbai 400068.

REFERENCE BOOKS:

1. Kothari, C.R.(2008). Research Methodology: Methods and Techniques. Second Edition. New Age International Publishers, New Delhi.
2. Sinha, S.C. and Dhiman, A.K., 2002. Research Methodology, Ess Ess Publications. 2 volumes.
3. Gupta S.P. (2008). Statistical Methods. 37 th ed. (Rev)Sultan Chand and Sons. New Delhi. 1470 p.

OPEN EDUCATIONAL RESOURCES:

1.http://www2.ift.ulaval.ca/~chaib/IFT-6001/articles/RMethodology_Marzuki_1.pdf

2.https://gradcoach.com/what-is-research-methodology/

II M.Sc.

SELF LEARNING COURSE

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	21PG4ITSL1	ARTIFICIAL INTELLIGENCE	PG Core	-	2

COURSE DESCRIPTION

This course provides a formal discipline within business education that bridges the gap between information technology and organization.

COURSE OBJECTIVES

This course is aimed to evaluate the role of information systems in today's competitive business environment

UNITS

UNIT1: INTRODUCTION :

Introduction - Foundation and History of AI – Intelligent Agent– Agents and environments - The nature of environments – structure of agents – Types of agents

UNIT 2 :SEARCHING TECHNIQUES

Searching Techniques Formulation of problem - informed search –Best first search – heuristic search – Iterative improvement algorithm – uniformed

search strategies - avoiding repeated states – searching with partial information .

UNIT 3 :CSP

Constraint satisfaction problems (CSP) – Backtracking search and Local search for CSP – Structure of problems- Adversarial Search –

UNIT 4 :GAMES :

Games – Optimal decisions in games – Alpha – Beta Pruning – imperfect real-time decision – games that include an element of chance.

UNIT 5: PLANNING:

Representation of Planning – Partial Order Planning Algorithm – Conditional Planning and Re planning Agent

TEXT BOOK:

1. Stuart Russell, Peter Norvig, “Artificial Intelligence – A Modern Approach”, Pearson Education / Prentice Hall of India, 3rd Edition,2009.

REFERENCE BOOKS

1. Nils J. Nilsson, “Artificial Intelligence: A new Synthesis”, Harcourt Asia Pvt. Ltd., 2000.

2. Elaine Rich and Kevin Knight, “Artificial Intelligence”, Tata McGraw-Hill,2nd Edition, 2008.

3. George F. Luger, “Artificial Intelligence-Structures and Strategies for Complex Problem Solving”, Pearson Education, 2008

Levels	C1	C2	C3	C4	Total Scholastic Marks	Non Scholastic Marks C5	CIA Total	% of Assessment
	Session - wise Average	Better of W1, W2	M1+M2	MID-SEM TEST				
	5 Mks.	5+5=10 Mks.	15 Mks	5 Mks	35 Mks.	5 Mks.	40Mks.	
K1	5	-	-	2 ½	-		-	-

K2	**-**	**5**	**4**	**2 ½**	**5**		**5**	**12.5 %**
K3	**-**	**-**	**3**	**5**	**12**		**12**	**30 %**
K4	**-**	**-**	**3**	**5**	**9**		**9**	**22.5%**
Non Scholastic	**-**	**-**	**-**	-	**9**		**9**	**22.5 %**
Total	**5**	**5**	**10**	**15**	**35**	**5**	**40**	**100 %**

CIA	
Scholastic	**35**
Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC				NON - SCHOLASTIC	MARKS		
C1	**C2**	**C3**	**C4**	**C5**	**CIA**	**ESE**	**Total**
5	**10**	**15**	**5**	**5**	**40**	**60**	**100**

C1 – Average of Two Session Wise Tests

C2 – Average of Two Monthly Tests

C3 - Mid Sem Test

C4 – Best of Two Weekly Tests

C5 – Non - Scholastic

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Explain the agents and environment specification for real world problem	K2	PSO1, PSO2
CO 2	Explore the searching techniques and planning methods for finding the solution	K3	PSO3, PSO6
CO 3	Apply adversarial search and various learning techniques for real world and toy world problems	K3	PSO4, PSO5
CO 4	Apply the learning techniques to support for real world automated taxi driving application	K3, K4	PSO3, PSO9

COURSE DESIGNER:

1. **Dr.V. Jane Varamani sulekha**

Forwarded By

HOD'S Signature

& Name