FATIMA COLLEGE (AUTONOMOUS)

Re-Accredited with "A++" Grade by NAAC (4thCycle)

Maryland, Madurai- 625 018, Tamil Nadu, India

NAME OF THE DEPARTMENT: INFORMATION TECHNOLOGY

NAME OF THE PROGRAMME : B. Sc.

PROGRAMME CODE : USIT

ACADEMIC YEAR : 2022-23

DATE

B.Sc INFORMATION TECHNOLOGY

Minutes of the meeting of the Board of Studies for B.Sc IT held at Department of Information Technology on 16.3.22.

Members present:

1. Prof. Dr. S. Kannan
   Department of Computer Application
   School of Information Technology
   Madurai kamaraj university,
   Madurai

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

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

Absent

4. Mrs. M. Thilagavathy Madhavan,
   Senior Programmer Analyst,
   Aparajitha Corporate service pvt ltd.,
   Madurai.

5. Ms. T.G. Poornima devi, Faculty
   Dolphins Silé school,
   Madurai

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

Mrs. V. Nageshwari - V. Nageshwari

Mrs. T. Leena prema kumari - T. Leena prema kumari

Mrs. T. Chowraya Nagamma - T. Chowraya Nagamma

Dr. V. Jaya varanasi Sulekha - V. J. V. Sulekha

Dr. N. Kalaiselvi - N. Kalaiselvi

Mrs. I. Razia Begum - I. Razia Begum

1. ACTION TAKEN REPORT

The Action Taken Report for the academic year 2021-22 was presented as,

Suggestions	Action taken
* Graphics concepts has to be included in 'C' programming	Graphics concepts has included in unit 5 of 'Programming in C' course
* AWT concepts has to be removed in 'programming in JAVA'	AWT concepts has removed
* Recent trends has to be included in Mobile computing and cloud technologies	Suggestions has been carried out in the mentioned course

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CHANGE OF COURSE TITLE

S.NO	OLD COURSE CODE	NEW COURSE CODE	OLD COURSE TITLE	NEW TITLE	NEED FOR CHANGE
1.	19I1CC1	21I1CC1	Fundamentals of computing	programming in C	Suggestion by Board members
2	19I6ME3	21I6ME3	Cloud computing	cloud technologies	Syllabus updated
3	19I6ME4	21I6ME4	Mobile computing	Mobile Communication	Syllabus is updated.

NEW COURSES INTRODUCED

S.NO	COURSE CODE	COURSE TITLE	RELEVANCE TO				SCOPE FOR			NEED FOR INTRODUCTION
			L	R	N	Q	EMP	ENT	SD	
1.	21AL4AC14	Accounting in Decision Making			✓		✓			Inter-disciplinary Allied paper for IT Students.
2.	21I4ACAC4	Web programming				✓	✓			Inter-disciplinary Allied for B.com CA
3.	21I3SB1	Excel using VBA				✓	✓			Industrial Requirement
4.	21I5SB3	Basics of HTML 5				✓	✓			Industrial Requirement
5.	21I5SB4	Web programming using PHP				✓	✓			To develop web Designing skills
6.	21I6SB5	Advanced HTML5				✓	✓			Enhance Employability skills.
7.	21I6SB6	Fundamentals of Android programming				✓	✓			Industrial Requirement.

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S.NO	COURSE CODE	COURSE TITLE	RELEVANCE TO L	R	N	G	SCOPE FOR Emp	ENT	SD	NEED FOR INTRODUCTION
8.	21I1SLK1	Trends in Information Technology				✓	✓			To enrich knowledge in IT.
9.	21I2SLK1	privacy & security in online social media				✓	✓			To know more about security Issues.
10.	21I3SL1	video Editing tools				✓	✓			Industrial Requirements.
11.	21I4SL1	Introduction to Computer forensics				✓			✓	To impart knowledge.
12.	21I5SL1	Green Computing				✓			✓	Industrial Requirements.
13.	21I6SLI1	Data science & tools				✓	✓		✓	Industrial Requirements.

S.NO	COURSE CODE	REVISED COURSES: COURSE TITLE	REVISED CONTENT	% OF REVISION	NEED FOR REVISION	RELEVANCE TO L	R	N	G	SCOPE FOR Em	EN	SD
1.	21I1CC1	programming in C	Fundamental removed & Graphics included	30%	members Suggestion				✓		✓	
2.	21I4CC1	Programming in JAVA	AWT concept in unit 4 is removed unit 3 & 5 are Shuffled	60%	This can be given for PG				✓		✓	

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S.NO	COURSE CODE	COURSE TITLE	REVISED CONTENT	% OF REVISION	NEED FOR REVISION	RELEVANCE TO L	R	N	Ч	SCOPE FOR Em	ET	SD
3.	21IbmE3	Cloud Technologies	Unit 5: Cloud Architecture is introduced.	20%	Members suggestion				✓		✓	
4.	21IbmE4	Mobile Communication	Wireless LAN, WAP. Introduced	20%	Know more about WAP				✓		✓	

II. DOER: The Digital Open Educational Resources for the courses was presented in the following format:

S.NO	COURSE CODE	COURSE TITLE	DETAILS OF UPDATION

III. CHANGE OF COURSE TITLE - NIL

IV. NEW COURSES INTRODUCED

S.NO	COURSE CODE	COURSE TITLE	RELEVANCE TO L	R	N	Ч	SCOPE FOR Em	ET	SD	NEED FOR INTRODUCTION
1.	22I3SB1	Automation Skills				✓	✓			Industrial Requirement
2.	22I5SB4	Image Manipulation Tool				✓	✓			Board member suggestions

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V. REVISED 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.	22IINME / 22I2NME	Image Editing Tool	Content Changed in unit I & II	40%	Member Suggestion				✓	✓		
2.	21I2CC3	Data Structure using C++	Function Concept added, BST Concept removed	5%	Industrial Requirement				✓	✓		
3.	19I3CC5	Database Management System	unit III & IV is interchanged		Members suggestion				✓	✓		
4.	22I4CC7	programming in JAVA	All units are changed	90%	Members suggestions				✓	✓		
5.	19I4SB2	Analytical Skills	puzzle list, games, races Concepts are removed	5%	Members suggestion				✓	✓		
6.	22I5CC9	.NET Programming	All units are Changed.	90%	Members suggestion				✓	✓		
7.	19I6CC13	python programming	All units are changed	95%	Members suggestion				✓	✓		
8.	22I6ME3	Cloud Technology	Contents Changed to include Grid Concepts	5%	Members suggestion				✓		✓	
9.	19I6ME5	Information Storage & Management	FC connectivity included	5%	Members suggestion				✓		✓	

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VI. Value added courses that is offered other than already being offered - Dynamic website designing using HTML 5 - 22UGVA2

VII: Approval of Ph.D course work Syllabus - Nil.

VIII: RUBRICS FOR PROJECT:

S.NO	C1 (20mks)	C2 (20mks)	CIA TOTAL (40 mks)	EXTERNAL (60mks)
1.	Review I: * Selection * Presentation	Review II: * Presentation * Documentation	C1 + C2	* Presentation * Implementation

IX. COMMENDATIONS:

* Supporting materials can be prepared for slow learners.
* Specific topics can be specified in Dynamism unit. Case studies can also be specified.

SEMESTER I:

21I1CC1 - Programming in C
21I1CC2 - Lab 1: programming in C
19G1AC I1 - Discrete Mathematics
22 I1NME - Non-Major Elective: Image Editing tool

SEMESTER II:

21I2CC3 - Data structures using C++
21I2CC4 - Lab 2: Data structures using C++
19G2AC I2 - Operations Research
22 I2NME - Non Major Elective: Image Editing tool

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SEMESTER III:

19I3CC5 - Data Base Management System
19I3CC6 - Lab 3: RDBMS
19P3ACI3 - Digital principles and computer Architecture
22I3SB1 - Automation Skills

SEMESTER IV:

22I4CC7 - Programming in JAVA
22I4CC8 - Lab 4: Java programming.
21A4ACI4 - Accounting in Decision Making.
19I4SB2 - Analytical Skills.

SEMESTER V:

22I5CC9 - .NET Programming
19I5CC10 - Lab 5: .Net programming
19I5CC11 - Software Engineering
19I5CC12 - Operating Systems
19I5ME1/19I5ME2 - Data Mining / Network Security.
21I5SB3 - Excel using VBA
22I5SB4 - Image Manipulation tools.

SEMESTER VI:

22I6CC13 - python programming
22I6CC14 - Lab 6: python programming
19I6CC15 - Data communication and Networking
19I6CC16 - project
22I6ME3/21I6ME4 - Cloud Technology / Mobile Communication
19I6ME5/19I6ME6 - Information storage Management / Computer Graphics
21I6SB5 - Web programming using PHP
21I6SB6 - Fundamentals of Android programming.

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Members:

Dr. S. Kannan - S.Kannan

Dr. K. Kuzhumaraj - K. Kuzhumaraj

Mrs. M. Thilagavathi Madhavan - M. Thilagavathi

Ms. P.G. Poornima devi - [signature]

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

Mrs. V. Mageshwari - [signature]

Mrs. T. Leena premakumari - [signature]

Mrs. T. Charanya Nagammal - T. Charanya

Dr. V. Janararamani Sulekha - V. J. V. Sulekha

Dr. N. Kalaichelvi - N. Kalaichelvi

Mrs. I. Razul Beevi - I. Razul Beevi

16/3/2022

DEPARTMENT OF INFORMATION TECHNOLOGY

PROGRAMME CODE : USIT

PART – I – TAMIL / FRENCH / HINDI– 12 CREDITS

PART – I – TAMIL

Offered by The Research Centre of Tamil

S. NO	SEM.	COURSE CODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. MKs
1.	I	19TL1C1	Language-Modern Literature nghJj;jkpo; - ,f;fhy ,yf;fpak;	5	3	40	60	100
2.	II	19TL2C2	Language - Bakthi Literature nghJj;jkpo; - gf;jp ,yf;fpak;	5	3	40	60	100
3.	III	19TL3C3	Language- Epic Literature nghJj;jkpo; - fhg;gpa ,yf;fpak;	5	3	40	60	100
4.	IV	19TL4C4	Language-Sangam Literature nghJj;jkpo; - rq;f ,yf;fpak;	5	3	40	60	100
			Total	20	12			

PART – I –FRENCH

Offered by The Department of French

S. NO	SEM.	COURSE CODE	COURSE TITLE	HRS	CRE DIT	CIA Mks	ESE Mks	TOT. MKs
1.	I	19RL1C1	PART 1 LANGUAGE FRENCH - LE NIVEAU INTRODUCTIF	5	3	40	60	100
2.	II	19RL2C2	PART 1 LANGUAGE FRENCH - LE NIVEAU DÉCOUVERTE	5	3	40	60	100
3.	III	19RL3C3	PART 1 LANGUAGE FRENCH - NIVEAU INTERMEDIAIRE	5	3	40	60	100
4.	IV	19RL4C4	PART 1 LANGUAGE FRENCH - NIVEAU DE SUIVRE	5	3	40	60	100
			Total	20	12			

PART – I – HINDI

Offered by The Department of Hindi

S. NO	SEM.	COURSE CODE	COURSE TITLE	HRS	CRE DIT	CIA Mks	ESE Mks	TOT. MKs
1.	I	19DL1C1	PART 1 LANGUAGE HINDI - VYAKARAN AUR KARYALAYEEN HINDI	5	3	40	60	100
2.	II	19DL2C2	PART 1 LANGUAGE HINDI -SRIJANATMAK HINDI AUR GADHYA	5	3	40	60	100
3.	III	19DL3C3	PART 1 LANGUAGE HINDI - HINDI SAHITHYA KA AADHIKAAL AUR BHAKTHIKAAL	5	3	40	60	100
4.	IV	19DL4C4	PART 1 LANGUAGE HINDI - REETIKALEEN	5	3	40	60	100

S. NO	SEM.	COURSE CODE	COURSE TITLE	HRS	CRE DIT	CIA Mks	ESE Mks	TOT. MKs
			HINDI SAHITHYA AUR AADHUNIK KAAL					
			Total	**20**	**12**			

PART – II -ENGLISH – 12 CREDITS

Offered by The Research Centre of English

S. NO	SEM.	COURSEC ODE	COURSE TITLE	HRS	CRE DIT	CIA Mks	ESE Mks	TOT. MKs
1.	**I**	19EL1WB	BASIC COMMUNICATIVE ENGLISH	5	3	40	60	100
2.		19EL1WI	INTERMEDIATE COMMUNICATIVE ENGLISH	5	3	40	60	100
3.		19EL1WA	ADVANCED COMMUNICATIVE ENGLISH	5	3	40	60	100
4.	**II**	19EL2WB	ENGLISH FOR EFFECTIVE COMMUNICATION (BASIC)	5	3	40	60	100
5.		19EL2WI	ENGLISH FOR EMPOWERMENT (INTERMEDIATE)	5	3	40	60	100
6.		19EL2WA	ENGLISH FOR CREATIVE WRITING (ADVANCED)	5	3	40	60	100
7.	**III**	19EL3WN	ENGLISH FOR DIGITAL ERA	5	3	40	60	100

S. NO	SEM.	COURSECODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. MKs
8.	IV	19EL4WN	ENGLISH FOR INTEGRATED DEVELOPMENT	5	3	40	60	100
			Total	**20**	**12**			

PART – III -MAJOR, ALLIED & ELECTIVES – 95 CREDITS

MAJOR CORE COURSES INCLUDING PRACTICALS : 60 CREDITS

S.NO	SEM.	COURSECODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. Mks
1.	I	21I1CC1	PROGRAMMING IN C	6	4	40	60	100
2.		21I1CC2	LAB I : PROGRAMMING IN C	6	3	40	60	100
3.	II	21I2CC3	DATA STRUCTURES USING C++	6	4	40	60	100
4.		21I2CC4	LAB II: DATA STRUCTURES USING C++	6	3	40	60	100
5.	III	19I3CC5	DATABASE MANAGEMENT SYSTEM	6	4	40	60	100
6.		19I3CC6	LAB III: RDBMS	6	3	40	60	100
7.	IV	22I4CC7	PROGRAMMING IN JAVA	6	4	40	60	100
8.		22I4CC8	LAB IV:JAVA PROGRAMMING	6	3	40	60	100

S.NO	SEM.	COURSECODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. Mks
9.	V	22I5CC9	.NET PROGRAMMING	5	5	40	60	100
10.		22I5CC10	LAB V: .NET PROGRAMMING	6	3	40	60	100
11.		19I5CC11	SOFTWARE ENGINEERING	5	3	40	60	100
12.		19I5CC12	OPERATING SYSTEMS	5	5	40	60	100
13.	VI	22I6CC13	PYTHON PROGRAMMING	5	5	40	60	100
14.		22I6CC14	LAB VI PYTHON PROGRAMMING	6	3	40	60	100
15.		19I6CC15	DATA COMMUNICATION AND NETWORKING	5	5	40	60	100
16.		19I6CC16	PROJECT	-	3	40	60	100

ALLIEDCOURSES- 20 CREDITS

S.NO	SEM.	COURSECODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. MKs
1.	I	19G1ACI1	DISCRETE MATHEMATICS	5	5	40	60	100
2.	II	19G2ACI2	OPERATIONS RESEARCH	5	5	40	60	100
3.	III	19P3ACI3	DIGITAL PRINCIPLES AND COMPUTER ARCHITECTURE	5	5	40	60	100

S.NO	SEM.	COURSECODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. MKs
4.	IV	21AC4ACI4	ACCOUNTING IN DECISION MAKING	5	5	40	60	100

ELECTIVES-15 CREDITS

S.No	SEM.	COURSECODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. Mks
1.	V	19I5ME1/19I5ME2	DATA MINING/NETWORK SECURITY	5	5	40	60	100
2.	VI	21I6ME3/ 21I6ME4	CLOUD TECHNOLOGY/ MOBILE COMMUNICATION	5	5	40	60	100
3.		19I6ME5/ 19I6ME6	INFORMATION STORAGE AND MANAGEMENT /COMPUTER GRAPHICS	5	5	40	60	100

PART – IV – 20 CREDITS

- **VALUE EDUCATION**
- **ENVIRONMENTAL AWARENESS**
- **NON MAJOR ELECTIVE**
- **SKILL BASED COURSES**

S. No	SEM.	COURSECODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. Mks
1.	I	19G1VE	Value Education (Including Meditation in Action Movement)	1	1	40	60	100
2.		21I1NME	Non Major Elective– Image Editing Tool (Offered to other major Students)	2	2	40	60	100
3.	II	19G2VE	Value Education	1	1	40	60	100
4.		21I2NME	Non Major Elective - Image Editing Tool (Offered to other major Students)	2	2	40	60	100
5.	III	19I3EN1	Environmental Education	1	1	40	60	100
6.		22I3SB1	Skill based–Automation Skills	2	2	40	60	100
7.	IV	19I4EN1	Environmental Education	1	1	40	60	100
8.		19I4SB2	Skill based - Analytical Skills	2	2	40	60	100
9.	V	21I5SB3	Skill based –Excel using VBA	2	2	40	60	100
10.		22I5SB4	Skill based – Image Manipulation tools	2	2	40	60	100
11.	VI	21I6SB5	Skill based –Web Programming using PHP	2	2	40	60	100
12.		21I6SB6	Skill based – Fundamentals of Android Programming	2	2	40	60	100

PART – V – 1 CREDIT

OFF-CLASS PROGRAMMES - ALL PART-V

SHIFT - II

S. No	SEM.	COURSE CODE	COURSE TITLE	HRS	CREDIT	TOT. Mks
1.	I - IV	21S4PED	Physical Education	30/ SEM	1	100
2.		21S4YRC	Youth Red Cross			
3.		21S4NSS	NSS			
4.		21S4RTC	Rotaract			
5.		21S4WEC	Women Empowerment Cell			
6.		21S4ACUF	AICUF			

OFF-CLASS PROGRAMME

ADD-ON COURSES

COURSE CODE	Courses	Hrs.	Credits	Semester in which the course is offered	CIA Mks	ESE Mks	Total Marks
21UAD2CA	**COMPUTER APPLICATIONS**	40	2	I&II	40	60	100
	ONLINE SELF LEARNING COURSE- Foundation Course for Arts	40	3	I	50	-	50
	ONLINE SELF LEARNING COURSE- Foundation	40	3	II	50	-	50

COURSE CODE	Courses	Hrs.	Credits	Semester in which the course is offered	CIA Mks	ESE Mks	Total Marks
	Course for Science						
	ETHICAL STUDIES-Value Education	15	2	III-VI	50 each Semester	-	100
	HUMAN RIGHTS	15	2	V	-	-	100
	OUTREACH PROGRAMME- Reach Out to Society through Action**ROSA**	100	3	V & VI	-	-	100
	PROJECT	30	4	VI	40	60	100
	READING CULTURE	10/Semester	1	II-VI	-	-	-
	MOOC COURSES(Department Specific Courses/any other courses) * Students can opt other than the listed course from UGC-SWAYAM UGC / CEC	-	Minimum 2 Credits	-	-	-	
	TOTAL		22 +				

EXTRA CREDIT COURSES

COURSE CODE	COURSE	HRS.	CREDITS	SEMESTER IN WHICH THE COURSE IS OFFERED	CIA MKS	ESE MKS	TOTAL MARKS
21I1SLK1	**SELF LEARNING COURSES for ADVANCED LEARNERS: TRENDS IN INFORMATION TECHNOLOGY**	-	2	I	40	60	100
21I3SL1	**SELF LEARNING COURSES for ADVANCED LEARNERS: GREEN COMPUTING**	-	2	III	40	60	100
21J5SLI1	**SELF LEARNING COURSES for ADVANCEDLEARNERS: DATA SCIENCE & TOOLS**	-	2	V	40	60	100
	MOOC COURSES / International Certified online Courses (Department Specific Courses/any other courses) * Students can opt other than the listed course from	-	Minimum 2 Credits	I – VI	-	-	

	UGC-SWAYAM UGC / CEC						

OFF CLASS PROGRAMMES:

19UGVAI1 - Crash Course: Animation Software

21UGVAI2 – Web Designing using HTML5

OLD SYLLABUS

I B.Sc. Information Technology

SEMESTER –II

For those who joined in 2021 onwards

Deletion

5%

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
USIT	21I2CC3	DATA STRUCTURES USING C++	Lecture	6	4

COURSE DESCRIPTION

This course introduces the basic concepts of C++. It also aims at facilitate the students to know the Data Structure concepts.

COURSE OBJECTIVES

To impart Technical and Practical knowledge in Object oriented Programming with C++ & Data Structures.

UNITS

UNIT –I OBJECT ORIENTED CONCEPTS (17 HRS.)

Classes and Objects: Specifying a class Defining Member functions- A C++ Program with Class-Making an Outside function Inline – Nesting of Member Function - Memory allocation for objects- Static Data Members & Member Functions - Array of Objects - Friendly functions - – Functions: Function Prototyping – Call by reference – Recursion – Function Overloading - Local Classes. Constructors and Destructors: Constructors- Parameterized Constructors- Multiple Constructors in Class- **copy constructors- Dynamic Constructors(Self Study)**- Destructors.

UNIT –II OPERATOR OVERLOADING & INHERITANCE (17 HRS.)

Defining operator overloading - Overloading unary operators-Overloading binary operators-using friend function -manipulation of strings using operators-rules for overloading operators- Extending Classes: Introduction-Defining derived classes-single inheritance- Multiple Inheritance-Multilevel Inheritance-**Hierarchical inheritance- Hybrid Inheritance(Self Study)**-Virtual Base classes- Abstract Classes- Constructor in Derived Classes-Member Classes: Nesting of Classes.

UNIT –III POINTERS, VIRTUAL FUNCTIONS & POLYMORPHISM (17 HRS.)

Pointers: Pointers to Objects – This Pointers – Pointers to Derived Class - Virtual Functions- Pure virtual function - **Virtual Constructors and Destructors (Self Study)**.DATA STRUCTURES: Introduction to Data Structures – Types of Data Structures - Data Structures Operations.

UNIT –IV LINKED LIST, STACKS & QUEUES (17 HRS.)

Linked List –Basic Concepts – Linked List Implementation – Types of Linked List- Circular Linked List – Doubly Linked List – Stack – Stack Operations – Stack Implementation – Queue – Basic Concepts –Queue Operations –Queue Implementations - Circular queues –Priority Queue – **Double Ended Queues (Self Study).**

UNIT –V TREES, SEARCHING AND SORTING (17 HRS.)

Trees: Basic Concepts - Binary trees – Binary Tree Representation - Binary tree Traversal - Binary Search tree – Tree Variants – Sorting Techniques – Searching Techniques

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

Real- time Applications using C++

TEXT BOOK:

1. Balagurusamy, E. Object Oriented Programming and Data Structures, Tata McGraw-Hill Education, 2015. Chapters 4,6, 7,8,9,10,12,13,14,15,16,17

REFERENCES:

1. Dewhurst, Stephen C., and Kathy T. Stark.Programming in C++. Prentice-Hall, Inc., 1989.
2. Lafore, Robert. Object-oriented programming in Turbo C++.Galgotia publications, 2001.
3. Allen, Weiss Mark. Data structures and algorithm analysis in C++.Pearson Education India, 2007.

Digital Open Educational Resources (DOER):

1. Data Structure and Algorithms Tutorial

https://www.tutorialspoint.com/data_structures_algorithms/index.htm

2. Introduction To Data Structure

https://www.w3schools.in/data-structures-tutorial/intro/

3. C++ Tutorial

https://www.tutorialspoint.com/cplusplus/index.htm

4. C++ Tutorials and Resources

https://www.w3schools.in/category/cplusplus-tutorial/

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 OBJECT ORIENTED CONCEPTS				
1.1	Classes and Objects: Specifying a class Defining Member functions, C++ Program with Class	2	Chalk & Talk	Black Board
1.2	Making an Outside function Inline Nesting of Member Function	2	Chalk & Talk	Black Board
1.3	Memory allocation for objects Static Data Members & Member Functions	3	Lecture	PPT& White board
1.4	Array of Objects, Friendly functions, Local Classes	2	Lecture	Smart Board
1.5	Constructors and Destructors: Constructors	2	Lecture	Black Board
1.6	Parameterized Constructors	2	Discussion	Google classroom
1.7	Multiple Constructors in Class, Destructors.	2	Chalk & Talk	Green Board
1.8	Copy constructors, Dynamic Constructors (Self Study)	2	Discussion	Black Board
UNIT -2 OPERATOR OVERLOADING & INHERITANCE				

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
2.1	Defining operator overloading: Overloading unary operators, Overloading binary operators	3	Lecture	Green Board Charts
2.2	Using friend function, Manipulation of strings using operators-Rules for overloading operators	4	Chalk & Talk	Green Board
2.3	Extending Classes: Introduction, Defining Derived Classes, Single Inheritance	3	Chalk & Talk	Black Board
2.4	Multiple Inheritance, Multilevel Inheritance, Virtual Base classes, Abstract Classes	3	Chalk & Talk	Black Board
2.5	Hybrid Inheritance, Hierarchical Inheritance (Self Study)	1	Discussion	Black Board
2.6	Constructor in Derived Classes, Member Classes: Nesting of Classes.	3	Chalk & Talk	Black Board
UNIT -3 POINTERS, VIRTUAL FUNCTIONS & POLYMORPHISM				
3.1	Pointers: Pointers to Objects, This Pointers	4	Chalk & Talk	Black Board
3.2	Pointers to Derived Class, Virtual Functions, Pure virtual function.	4	Chalk & Talk	Black Board
3.2	Virtual Constructors and Destructors (Self Study)	1	Discussion	Black Board
3.3	Data Structures: Introduction to Data Structures, Types of Data Structures	4	Chalk & Talk	Black Board
3.4	Data Structures Operations	4	Chalk & Talk	Black Board
UNIT -4 LINKED LIST, STACKS & QUEUES				
4.1	Linked List –Basic Concepts	1	Chalk & Talk	Black Board
4.2	Linked List Implementation, Types of Linked List	3	Chalk & Talk	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
4.3	Circular Linked List, Doubly Linked List	3	Lecture	PPT& White board
4.4	Stack Operations, Stack Implementation	4	Chalk & Talk	Black Board
4.5	Basic Concepts, Queue Operations, Queue Implementations.	3	Lecture	PPT& White board
4.6	Circular queues, Priority Queue	2	Chalk & Talk	Black Board
4.7	Double Ended Queues (Self Study)	1	Discussion	Black Board
UNIT -5 TREES, GRAPH, SEARCHING AND SORTING				
5.1	**Trees:** Basic Concepts, Binary trees	3	Chalk & Talk	Black Board
5.2	Binary Tree Representation, Binary tree Traversal	3	Chalk & Talk	Black Board
5.3	Binary Search tree, Tree Variants	3	Chalk & Talk	Black Board
5.4	**Graphs :** Basic Concept, Graph Terminology, Graph Implementation	2	Lecture	PPT& White board
5.5	Shortest Path Algorithm	2	Lecture	PPT& White board
5.6	Graph Traversal (Self Study)	1	Discussion	Black Board
5.7	Sorting Techniques, Searching Techniques	3	Discussion	Google classroom
UNIT –6 DYNAMISM				
6.1	Real- time Applications using C++	2	Discussion	Black Board
6.2	Real- time Applications using C++	3	Discussion	Black Board

INTERNAL - UG

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

	T1 10 Mks.	T2 10 Mks.	Quiz 5 Mks.	Assignment 5 Mks	OBT/PPT 5 Mks	35 Mks.	5 Mks.	40Mks.	
K1	**2**	**2**	**-**	**-**	**-**	**4**	-	**4**	10 %
K2	**2**	**2**	**5**	**-**	**-**	**9**	-	**9**	22.5 %
K3	**3**	**3**	**-**	**-**	**5**	**11**	-	**11**	27.5 %
K4	**3**	**3**	**-**	**5**	**-**	**11**	-	**11**	27.5 %
Non Scholastic	**-**	**-**	**-**	**-**	-		**5**	**5**	12.5 %
Total	**10**	**10**	**5**	**5**	**5**	**35**	**5**	**40**	**100 %**

End Semester - UG

Levels	Section A (i) 5 Mks.	Section A (ii) 5 Mks	Section B 8 Mks.	Section C 12 Mks	Section D 20 Mks.	Section E 10 Mks.	Total 60Mks.	
K1	**5**	**5**	**-**	**4**	**-**	-	**14**	23.33 %
K2	**-**	**-**	**8**	**4**	**-**	-	**12**	20 %
K3	**-**	**-**	**-**	**-**	**20**	-	**20**	33.33 %
K4	**-**	**-**	**-**	**4**	**-**	10	**14**	23.34 %
Total	**5**	**5**	**8**	**12**	**20**	**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

UG CIA Components

			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	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	PSOs ADDRESSED

		TO REVISED BLOOM'S TAXONOMY)	
CO 1	Understand how to apply the major OOPs concepts to implement encapsulation, inheritance and polymorphism.	K1, K2	PSO1& PSO2
CO 2	Implement an achievable practical application and analyze issues related to object-oriented techniques in the C++ programming language	K1, K2 & K3	PSO2& PSO3
CO 3	Handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.	K1 & K3	PSO1, PSO2 & PSO3
CO 4	Use linear and non-linear data structures like Stacks, Queues, and Linked List.	K1, K2&K3	PSO1, PSO2 & PSO3
CO 5	Analyze various Searching and Sorting Techniques using C++.	K2 & K4	PSO5 &PSO6

Mapping of C0s with PSOs

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

Mapping of C0s with POs

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

CO4	**1**	**1**	**1**	**1**
CO5	**1**	**1**	**1**	**1**

Note: ♦ Strongly Correlated – **3** ♦ Moderately Correlated – **2**
♦ Weakly Correlated -**1**

COURSE DESIGNER:

1. **Staff Name: MRS. T. CHARANYA NAGAMMAL**

Forwarded By

V. Mageshwari

HOD'S Signature

& Name

NEW SYLLABUS

After Deletion

I B.Sc. Information Technology

SEMESTER –II

For those who joined in 2021 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
USIT	**21I2CC3**	**DATA STRUCTURES USING C++**	**Lecture**	**6**	**4**

COURSE DESCRIPTION

This course introduces the basic concepts of C++. It also aims at facilitate the students to know the Data Structure concepts.

COURSE OBJECTIVES

To impart Technical and Practical knowledge in Object oriented Programming with C++ & Data Structures.

UNITS

UNIT –I OBJECT ORIENTED CONCEPTS (17 HRS.)

Classes and Objects: Specifying a class Defining Member functions- A C++ Program with Class-Making an Outside function Inline – Nesting of Member Function - Memory allocation for objects- Static Data Members & Member Functions - Array of Objects - Friendly functions- Local Classes. Constructors and Destructors: Constructors- Parameterized Constructors- Multiple Constructors in Class- **copy constructors- Dynamic Constructors(Self Study)**- Destructors.

UNIT –II OPERATOR OVERLOADING & INHERITANCE (17 HRS.)

Defining operator overloading - Overloading unary operators-Overloading binary operators-using friend function -manipulation of strings using operators-rules for overloading operators- Extending Classes: Introduction-Defining derived classes-single inheritance- Multiple Inheritance-Multilevel Inheritance-**Hierarchical inheritance- Hybrid Inheritance(Self Study)**-Virtual Base classes- Abstract Classes- Constructor in Derived Classes-Member Classes: Nesting of Classes.

UNIT –III POINTERS, VIRTUAL FUNCTIONS & POLYMORPHISM (17 HRS.)

Pointers: Pointers to Objects – This Pointers – Pointers to Derived Class - Virtual Functions- Pure virtual function - **Virtual Constructors and Destructors (Self Study)**.DATA STRUCTURES: Introduction to Data Structures – Types of Data Structures - Data Structures Operations.

UNIT –IV LINKED LIST, STACKS & QUEUES (17 HRS.)

Linked List –Basic Concepts – Linked List Implementation – Types of Linked List- Circular Linked List – Doubly Linked List – Stack – Stack Operations – Stack Implementation – Queue – Basic Concepts –Queue Operations –Queue

Implementations - Circular queues –Priority Queue – **Double Ended Queues (Self Study).**

UNIT –V TREES, SEARCHING AND SORTING (17 HRS.)

Trees: Basic Concepts - Binary trees – Binary Tree Representation - Binary tree Traversal - Binary Search tree – Tree Variants – Sorting Techniques – Searching Techniques

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

Real- time Applications using C++

TEXT BOOK:

2. Balagurusamy, E. Object Oriented Programming and Data Structures, Tata McGraw-Hill Education, 2015. Chapters 4,6, 7,8,9,10,12,13,14,15,16,17

REFERENCES:

1. Dewhurst, Stephen C., and Kathy T. Stark.Programming in C++. Prentice-Hall, Inc., 1989.
2. Lafore, Robert. Object-oriented programming in Turbo C++.Galgotia publications, 2001.
3. Allen, Weiss Mark. Data structures and algorithm analysis in C++.Pearson Education India, 2007.

Digital Open Educational Resources (DOER):

1. Data Structure and Algorithms Tutorial - https://www.tutorialspoint.com/data_structures_algorithms/index.htm
2. Introduction To Data Structure -https://www.w3schools.in/data-structures-tutorial/intro/
3. C++ Tutorial -https://www.tutorialspoint.com/cplusplus/index.htm
4. C++ Tutorials and Resources - https://www.w3schools.in/category/cplusplus-tutorial/

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 OBJECT ORIENTED CONCEPTS				
1.1	Classes and Objects: Specifying a class Defining Member functions, C++ Program with Class	2	Chalk & Talk	Black Board
1.2	Making an Outside function Inline Nesting of Member Function	2	Chalk & Talk	Black Board
1.3	Memory allocation for objects Static Data Members & Member Functions	3	Lecture	PPT& White board
1.4	Array of Objects, Friendly functions, Local Classes	2	Lecture	Smart Board
1.5	Constructors and Destructors: Constructors	2	Lecture	Black Board
1.6	Parameterized Constructors	2	Discussion	Google classroom
1.7	Multiple Constructors in Class, Destructors.	2	Chalk & Talk	Green Board
1.8	Copy constructors, Dynamic Constructors (Self Study)	2	Discussion	Black Board
UNIT -2 OPERATOR OVERLOADING & INHERITANCE				
2.1	Defining operator overloading: Overloading unary operators, Overloading binary operators	3	Lecture	Green Board Charts
2.2	Using friend function, Manipulation of strings using operators-Rules for overloading operators	4	Chalk & Talk	Green Board
2.3	Extending Classes: Introduction, Defining	3	Chalk & Talk	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
	Derived Classes, Single Inheritance			
2.4	Multiple Inheritance, Multilevel Inheritance, Virtual Base classes, Abstract Classes	3	Chalk & Talk	Black Board
2.5	Hybrid Inheritance, Hierarchical Inheritance (Self Study)	1	Discussion	Black Board
2.6	Constructor in Derived Classes, Member Classes: Nesting of Classes.	3	Chalk & Talk	Black Board
UNIT -3 POINTERS, VIRTUAL FUNCTIONS & POLYMORPHISM				
3.1	Pointers: Pointers to Objects, This Pointers	4	Chalk & Talk	Black Board
3.2	Pointers to Derived Class, Virtual Functions, Pure virtual function.	4	Chalk & Talk	Black Board
3.2	Virtual Constructors and Destructors (Self Study)	1	Discussion	Black Board
3.3	Data Structures: Introduction to Data Structures, Types of Data Structures	4	Chalk & Talk	Black Board
3.4	Data Structures Operations	4	Chalk & Talk	Black Board
UNIT -4 LINKED LIST, STACKS & QUEUES				
4.1	Linked List –Basic Concepts	1	Chalk & Talk	Black Board
4.2	Linked List Implementation, Types of Linked List	3	Chalk & Talk	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
4.3	Circular Linked List, Doubly Linked List	3	Lecture	PPT& White board
4.4	Stack Operations, Stack Implementation	4	Chalk & Talk	Black Board
4.5	Basic Concepts, Queue Operations, Queue Implementations.	3	Lecture	PPT& White board
4.6	Circular queues, Priority Queue	2	Chalk & Talk	Black Board
4.7	Double Ended Queues (Self Study)	1	Discussion	Black Board
UNIT -5 TREES, GRAPH, SEARCHING AND SORTING				
5.1	**Trees:** Basic Concepts, Binary trees	3	Chalk & Talk	Black Board
5.2	Binary Tree Representation, Binary tree Traversal	3	Chalk & Talk	Black Board
5.3	Binary Search tree, Tree Variants	3	Chalk & Talk	Black Board
5.4	**Graphs :** Basic Concept, Graph Terminology, Graph Implementation	2	Lecture	PPT& White board
5.5	Shortest Path Algorithm	2	Lecture	PPT& White board
5.6	Graph Traversal (Self Study)	1	Discussion	Black Board
5.7	Sorting Techniques, Searching Techniques	3	Discussion	Google classroom
UNIT –6 DYNAMISM				

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
6.1	Real- time Applications using C++	2	Discussion	Black Board
6.2	Real- time Applications using C++	3	Discussion	Black Board

INTERNAL - UG

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1 10 Mks.	T2 10 Mks.	Quiz 5 Mks.	Assignment 5 Mks	OBT/PPT 5 Mks	35 Mks.	5 Mks.	40Mks.	
K1	2	2	-	-	-	4	-	4	10 %
K2	2	2	5	-	-	9	-	9	22.5 %
K3	3	3	-	-	5	11	-	11	27.5 %
K4	3	3	-	5	-	11	-	11	27.5 %
Non Scholastic	-	-	-	-	-		5	5	12.5 %
Total	10	10	5	5	5	35	5	40	100 %

End Semester - UG

Levels	Section A (i) 5 Mks.	Section A (ii) 5 Mks	Section B 8 Mks.	Section C 12 Mks	Section D 20 Mks.	Section E 10 Mks.	Total 60Mks.	
K1	5	5	-	4	-	-	14	23.33 %
K2	-	-	8	4	-	-	12	20 %
K3	-	-	-	-	20	-	20	33.33 %
K4	-	-	-	4	-	10	14	23.34 %
Total	5	5	8	12	20	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

UG CIA Components

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

C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	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 how to apply the major OOPs concepts to implement encapsulation, inheritance and polymorphism.	K1, K2	PSO1& PSO2
CO 2	Implement an achievable practical application and analyze issues related to object-oriented techniques in the C++ programming language	K1, K2 & K3	PSO2& PSO3
CO 3	Handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.	K1 & K3	PSO1, PSO2 & PSO3
CO 4	Use linear and non-linear data structures like Stacks, Queues, and Linked List.	K1, K2&K3	PSO1, PSO2 & PSO3
CO 5	Analyze various Searching and Sorting Techniques using C++.	K2 & K4	PSO5 &PSO6

Mapping of C0s with PSOs

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

Mapping of C0s with POs

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

Note: ♦ Strongly Correlated – **3** ♦ Moderately Correlated – **2**
♦ Weakly Correlated -**1**

COURSE DESIGNER:

1. **Staff Name: MRS. T. CHARANYA NAGAMMAL**

Forwarded By

V. Mageshwari

HOD'S Signature
& Name

OLD SYLLABUS

Deletion

5%

II B.Sc. Information Technology

SEMESTER – IV

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
USIT	19I4SB2	ANALYTICAL SKILLS	Lecture	2	2

COURSE DESCRIPTION

This course content plays a vital role for clearing any competitive exam and it covers all the Quantitative Aptitude topics and an in-depth understanding of this subject.

COURSE OBJECTIVES

To prepare the student with the range of skills which facilitate them to enhance their employability quotient and do well in the professional space.

UNITS

UNIT –I QUANTITATIVE APTITUDE – I (6HRS.)

Different Number System, More on Numbers, Ratio and Proportion, Percentage, Approximate Value Calculation.

UNIT –II QUANTITATIVE APTITUDE – II (6 HRS.)

Mixtures, Averages, Time and Distance, Problems Based on Trains, Rowing Downstream and Upstream.

UNIT –III QUANTITATIVE APTITUDE – III (6 HRS.)

Pipes and Cistern, Races, Games, Time and Work, Clocks, Mensuration Area and Volume.

UNIT –IV VERBAL REASONING- I (6 HRS.)

SERIES: Locating Wrong Number, Probability, Data Interpretation, Data Sufficiency Series Completion, Analogy, Classification, Coding – Decoding, Blood Relations, Puzzle Test.

UNIT –V VERBAL REASONING- II (6 HRS.)

Direction Sense Test, Alphabetical Quibble, Number,Ranking& time, Sequence test, Mathematical Operations, Logical Sequence of Words, Arithmetical Reasoning.

REFERENCES:

1. Aggarwal, R. S. Quantitative Aptitude. S. Chand, 2017.

OPEN EDUCATIONAL RESOURCES :

1. Quantitative Aptitude Tutorial - Tutorialspoint
https://www.tutorialspoint.com/quantitative_aptitude/index.htm
2. Aptitude Tutorial - Students Tutorial
https://www.studentstutorial.com/aptitude/aptitude-tutorial.php/aptitude-tutorial.php

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1	**QUANTITATIVE APTITUDE – I**			
1.1	Syllabus Discussion	1	Discussion	Black Board
1.2	Different Number System	1	Chalk & Talk	Black Board
1.3	More on Numbers	1	Chalk & Talk	Black Board
1.4	Ratio and Proportion	1	Chalk & Talk	Black Board
1.5	Percentage	1	Chalk & Talk	Black Board
1.6	Approximate Value Calculation	1	Chalk & Talk	Black Board
UNIT -2	**QUANTITATIVE APTITUDE – II**			

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
2.1	Mixtures	1	Chalk & Talk	Black Board
2.2	Averages	1	Chalk & Talk	Black Board
2.3	Time and Distance	1	Chalk & Talk	Black Board
2.4	Problems Based on Trains	1	Chalk & Talk	Black Board
2.5	Rowing Downstream and Upstream	2	Chalk & Talk	Black Board
UNIT - 3	**QUANTITATIVE APTITUDE – III**			
3.1	Pipes and Cistern	1	Chalk & Talk	Black Board
3.2	Races	1	Chalk & Talk	Black Board
3.3	Games	1	Chalk & Talk	Black Board
3.4	Time and Work	1	Chalk & Talk	Black Board
3.5	Clocks	1	Chalk & Talk	Black Board
3.6	Mensuration Area and Volume	1	Chalk & Talk	Black Board
UNIT - 4	**VERBAL REASONING- I**			
4.1	Locating Wrong Number	1	Chalk & Talk	Black Board
4.2	Probability	1	Chalk & Talk	Black Board
4.3	Data Interpretation, Data Sufficiency Series Completion	1	Chalk & Talk	Black Board
4.4	Analogy, Classification	1	Chalk & Talk	Black Board
4.5	Coding – Decoding	1	Chalk & Talk	Black Board
4.6	Blood Relations, Puzzle Test	1	Chalk & Talk	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT - 5 VERBAL REASONING- II				
5.1	Direction Sense Test, Alphabetical Quibble	1	Chalk & Talk	Black Board
5.2	Ranking & time	1	Chalk & Talk	Black Board
5.3	Sequence test	1	Chalk & Talk	Black Board
5.4	Mathematical Operations	1	Chalk & Talk	Black Board
5.5	Logical Sequence of Words	1	Chalk & Talk	Black Board
5.6	Arithmetical Reasoning	1	Chalk & Talk	Black Board

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 short cut methods.	K1& K2	PSO1& PSO3
CO 2	Apply general mathematical techniques.	K2 & K3	PSO1& PSO3
CO 3	Develop their critical thinking.	K2 & K3	PSO1& PSO3
CO 4	Recall the formulas.	K1& K2	PSO1& PSO2
CO 5	Solve the sums by applying shortcut methods with time management.	K2 & K3	PSO8

CIA	
Scholastic	35
Non Scholastic	5
	40

EVALUATION PATTERN

SCHOLASTIC		NON - SCHOLASTIC	MARKS		
C1	C2	C3	CIA	ESE	Total
20	15	5	40	60	100

C1 – Average of Two Model Test Marks

C2 – Assignment, quiz and OBT

C3 - Non-Scholastic

Mapping of COs with PSOs

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

Mapping of C0s with POs

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

Note: ♦ Strongly Correlated – **3** ♦ Moderately Correlated – **2**
♦ Weakly Correlated -**1**

COURSE DESIGNER:

1. **Staff Name: MRS. V. JANE VARAMANI SULEKHA**

Forwarded By

V. Mageshwari

HOD'S Signature
& Name

NEW SYLLABUS

II B.Sc. Information Technology

SEMESTER – IV

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
USIT	19I4SB2	ANALYTICAL SKILLS	Lecture	2	2

COURSE DESCRIPTION

This course content plays a vital role for clearing any competitive exam and it covers all the Quantitative Aptitude topics and an in-depth understanding of this subject.

COURSE OBJECTIVES

To prepare the student with the range of skills which facilitate them to enhance their employability quotient and do well in the professional space.

UNITS

UNIT –I QUANTITATIVE APTITUDE – I (6HRS.)

Different Number System, More on Numbers, Ratio and Proportion, Percentage, Approximate Value Calculation.

UNIT –II QUANTITATIVE APTITUDE – II (6 HRS.)

Mixtures, Averages, Time and Distance, Problems Based on Trains, Rowing Downstream and Upstream.

UNIT –III QUANTITATIVE APTITUDE – III (6 HRS.)

Pipes and Cistern, Time and Work, Clocks, Mensuration Area and Volume.

UNIT –IV VERBAL REASONING- I (6 HRS.)

SERIES: Locating Wrong Number, Probability, Data Interpretation, Data Sufficiency Series Completion, Analogy, Classification, Coding – Decoding, Blood Relations

UNIT –V VERBAL REASONING- II (6 HRS.)

Direction Sense Test, Alphabetical Quibble, Number,Ranking& time, Sequence test, Mathematical Operations, Logical Sequence of Words, Arithmetical Reasoning.

REFERENCES:

2. Aggarwal, R. S. Quantitative Aptitude. S. Chand, 2017.

OPEN EDUCATIONAL RESOURCES :

3. Quantitative Aptitude Tutorial - Tutorialspoint

https://www.tutorialspoint.com/quantitative_aptitude/index.htm

4. Aptitude Tutorial - Students Tutorial

https://www.studentstutorial.com/aptitude/aptitude-tutorial.php/aptitude-tutorial.php

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1	**QUANTITATIVE APTITUDE – I**			
1.1	Syllabus Discussion	1	Discussion	Black Board
1.2	Different Number System	1	Chalk & Talk	Black Board
1.3	More on Numbers	1	Chalk & Talk	Black Board
1.4	Ratio and Proportion	1	Chalk & Talk	Black Board
1.5	Percentage	1	Chalk & Talk	Black Board
1.6	Approximate Value Calculation	1	Chalk & Talk	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -2	**QUANTITATIVE APTITUDE – II**			
2.1	Mixtures	1	Chalk & Talk	Black Board
2.2	Averages	1	Chalk & Talk	Black Board
2.3	Time and Distance	1	Chalk & Talk	Black Board
2.4	Problems Based on Trains	1	Chalk & Talk	Black Board
2.5	Rowing Downstream and Upstream	2	Chalk & Talk	Black Board
UNIT - 3	**QUANTITATIVE APTITUDE – III**			
3.1	Pipes and Cistern	1	Chalk & Talk	Black Board
3.2	Races	1	Chalk & Talk	Black Board
3.3	Games	1	Chalk & Talk	Black Board
3.4	Time and Work	1	Chalk & Talk	Black Board
3.5	Clocks	1	Chalk & Talk	Black Board
3.6	Mensuration Area and Volume	1	Chalk & Talk	Black Board
UNIT - 4	**VERBAL REASONING- I**			
4.1	Locating Wrong Number	1	Chalk & Talk	Black Board
4.2	Probability	1	Chalk & Talk	Black Board
4.3	Data Interpretation, Data Sufficiency Series Completion	1	Chalk & Talk	Black Board
4.4	Analogy, Classification	1	Chalk & Talk	Black Board
4.5	Coding – Decoding	1	Chalk & Talk	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
4.6	Blood Relations, Puzzle Test	1	Chalk & Talk	Black Board
UNIT - 5 VERBAL REASONING- II				
5.1	Direction Sense Test, Alphabetical Quibble	1	Chalk & Talk	Black Board
5.2	Ranking & time	1	Chalk & Talk	Black Board
5.3	Sequence test	1	Chalk & Talk	Black Board
5.4	Mathematical Operations	1	Chalk & Talk	Black Board
5.5	Logical Sequence of Words	1	Chalk & Talk	Black Board
5.6	Arithmetical Reasoning	1	Chalk & Talk	Black Board

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 short cut methods.	K1& K2	PSO1& PSO3
CO 2	Apply general mathematical techniques.	K2 & K3	PSO1& PSO3
CO 3	Develop their critical thinking.	K2 & K3	PSO1& PSO3
CO 4	Recall the formulas.	K1& K2	PSO1& PSO2
CO 5	Solve the sums by applying shortcut methods with time management.	K2 & K3	PSO8

CIA	
Scholastic	35
Non Scholastic	5
	40

EVALUATION PATTERN

SCHOLASTIC		NON - SCHOLASTIC	MARKS		
C1	C2	C3	CIA	ESE	Total
20	15	5	40	60	100

C1 – Average of Two Model Test Marks

C2 – Assignment, quiz and OBT

C3 - Non-Scholastic

Mapping of COs with PSOs

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

Mapping of C0s with POs

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

Note: ♦ Strongly Correlated – **3** ♦ Moderately Correlated – **2**
♦ Weakly Correlated -**1**

COURSE DESIGNER:

1. Staff Name: MRS. V. JANE VARAMANI SULEKHA

Forwarded By

V. Mageshwari

HOD'S Signature

& Name

OLD SYLLABUS

Changes

5%

III B.Sc. Information Technology

SEMESTER –I

For those who joined in 2021 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
USIT	21I6ME3	CLOUD TECHNOLOGY	Lecture	5	5

COURSE DESCRIPTION

This course facilitates the students to understand, analyze the various applications of cloud tool and also provide solutions for cloud security and storage.

COURSE OBJECTIVES

To impart the knowledge about the Computations done in cloud, its architecture and to build their own cloud.

UNITS

UNIT –I UNDERSTANDING CLOUD COMPUTING (15HRS.)

Origin and Influence- Basic concepts and terminology-goals and benefits-Risks and challenges. FUNDAMENTAL CONCEPTS AND MODELS: **Roles and Boundaries-Cloud Characteristics-Cloud Delivery Models (Self Study).**

UNIT –II CLOUD ENABLING TECHNOLOGY (15 HRS.)

Broad band Network and Internet Architecture-Data center Technology-Virtualization Technology-Web Technology-Multitenant Technology-**Service Technology (Self Study)**.

UNIT –III FUNDAMENTAL CLOUD SECURITY (15 HRS.)

Basic terms and Concepts-Threat Agents-Cloud Security Threats.**Cloud Infrastructure Mechanism:** Virtual server-cloud storage devices-cloud usage monitor-Resource replication-**readymade Environment(Self Study).**

UNIT –IV SPECIALIZED CLOUD MECHANISMS (15 HRS.)

Automated Scaling Listener-Load balancer-SLA monitor-Pay-per-use monitor-Audit monitor. Hypervisor-**Multi Device Broker-state management database (Self Study).**

UNIT –V CLOUD COMPUTING ARCHITECTURE (15 HRS.)

Workload Distribution Architecture-Resource Pooling Architecture-Cloud Bursting Architecture-Redundant Storage Architecture.ADVANCED CLOUD ARCHITECTURES:Hypervisor clustering architecture-Load balanced virtual server instances architecture-Zero downtime architecture- cloud balancing architecture.

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

Virtual server-cloud storage devices.

TEXT BOOK:

1. Erl, Thomas, Ricardo Puttini, and ZaighamMahmood.CLOUD COMPUTING: CONCEPTS, TECHNOLOGY &ARCHITECTURE.Pearson Education, 2013.CHAPTER 3.1-3.4, 4.1-4.4, 5.1-5.6, 6.1-6.3, 7.2-7.6, 8.1-8.10,10.1-10.4, 10.5-10.8, 11.1, 11.2, 11.6, 11.8.

REFERENCES:

1. Buyya, Rajkumar, James Broberg, and Andrzej M. Goscinski, eds. Cloud computing: Principles and paradigms. Vol. 87.John Wiley & Sons, 2010.
2. Rhoton, John. "Cloud Computing Explained: Implementation Handbook for Enterprises. 2009." Recursive Limited.
3. Linthicum, David S. Cloud computing and SOA convergence in your enterprise: a step-by-step guide. Pearson Education, 2009.

OPEN EDUCATIONAL RESOURCES :

1. Learn Cloud Computing Tutorial - Javatpoint

   https://www.javatpoint.com/cloud-computing-tutorial

2. Cloud Computing Tutorial For Beginners

   https://www.guru99.com/cloud-computing-for-beginners.html

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT – I UNDERSTANDINGCLOUDCOMPUTING				
1.1	Origin and Influence	4	Chalk & Talk	Black Board
1.2	Basic concepts and terminology, goals and benefits	4	Chalk & Talk	Black Board
1.3	Risks and challenges	4	Lecture	PPT& White board
1.4	Roles and Boundaries-Cloud Characteristics-Cloud Delivery Models (Self Study).	2	Discussion	Black Board

UNIT – IICLOUDENABLINGTECHNOLOGY				
2.1	Broad band Network and Internet Architecture	3	Chalk & Talk	Black Board
2.2	Data center Technology	3	Chalk & Talk	Black Board
2.3	Virtualization Technology, Web Technology	4	Lecture	PPT& White board
2.4	Multitenant Technology	2	Lecture	Smart Board
2.5	Service Technology (Self Study)	2	Discussion	Black Board
UNIT – III FUNDAMENTALCLOUDSECURITY				
3.1	Basic terms and Concepts, Threat Agents	3	Chalk & Talk	Black Board
3.2	Cloud Security Threats	3	Chalk & Talk	Black Board
3.3	Cloud InfrastructureMechanism:Virtual server	2	Lecture	PPT& White board
3.4	cloud storage devices, cloud usage monitor	2	Lecture	Smart Board
3.5	Resource replication	2	Chalk & Talk	Black Board
3.6	Readymade Environment (Self Study)	2	Discussion	Black Board
UNIT – IV SPECIALIZEDCLOUDMECHANISMS				
4.1	Automated Scaling Listener, Load balancer	2	Chalk & Talk	Black Board
4.2	SLAmonitor, Pay-per-use monitor, Audit monitor	1	Chalk & Talk	Black Board

4.3	Fail over system, Hypervisor, Resource cluster	2	Chalk & Talk	Black Board
4.4	Multi Device Broker-state management database (Self Study)	1	Lecture	PPT& White board
4.5	Adapter Classes, Inner classes, Anonymous Inner classes	2	Lecture	Smart Board
4.6	Cloud security mechanism**:** Encryption	2	Discussion	Black Board
4.7	Hashing	2	Chalk & Talk	Black Board
4.8	Digitalsignature, Public key Infrastructure	2	Chalk & Talk	Black Board
UNIT – V CLOUD COMPUTING ARCHITECTURE				
5.1	Identity and access management	3	Chalk & Talk	Black Board
5.2	single sign on, Cloud Based security groups	3	Chalk & Talk	Black Board
5.3	Hardened Virtual Server Images	2	Lecture	PPT& White board
5.4	Fundamental cloud architecture	2	Lecture	Smart Board
5.5	Workload Distribution Architecture, Resource Pooling Architecture	2	Discussion	Black Board
5.6	Cloud Bursting Architecture-Redundant Storage Architecture (Self Study)	2	Discussion	Black Board
UNIT –6 DYNAMISM				
6.1	Server less Computing	2	Discussion	Black Board

6.2	Omni-Cloud, Quantum Computing	3	Discussion	Black Board

INTERNAL - UG

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1 10 Mks.	T2 10 Mks.	Quiz 5 Mks.	Assignment 5 Mks	OBT/PPT 5 Mks	35 Mks.	5 Mks.	40Mks.	
K1	2	2	-	-	-	4	-	4	10 %
K2	2	2	5	-	-	9	-	9	22.5 %
K3	3	3	-	-	5	11	-	11	27.5 %
K4	3	3	-	5	-	11	-	11	27.5 %
Non Scholastic	-	-	-	-	-		5	5	12.5 %
Total	10	10	5	5	5	35	5	40	100 %

End Semester - UG

Levels	Section A (i) 5 Mks.	Section A (ii) 5 Mks	Section B 8 Mks.	Section C 12 Mks	Section D 20 Mks.	Section E 10 Mks.	Total 60Mks.	
K1	5	5	-	4	-	-	14	23.33 %
K2	-	-	8	4	-	-	12	20 %
K3	-	-	-	-	20	-	20	33.33 %
K4	-	-	-	4	-	10	14	23.34 %
Total	5	5	8	12	20	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

UG CIA Components

			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	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 fundamental concepts of cloud service and deployment models.	K1& K2	PSO1& PSO2
CO 2	Identify the importance of virtualization along with their technologies.	K1& K2	PSO3
CO 3	Analyze different cloud computing Services.	K3 & K4	PSO6
CO 4	Analyze the components and the security in cloud.	K3 & K4	PSO6
CO 5	Illustrate different design & develop backup strategies for cloud data based on features.	K3 & K4	PSO6, PSO7 & PSO8

Mapping of COs with PSOs

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

Mapping of C0s with POs

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

Note: ♦ Strongly Correlated – **3** ♦ Moderately Correlated – **2**
♦ Weakly Correlated -**1**

COURSE DESIGNER:

1. **Staff Name: MRS. T. LEENA PREMA KUMARI**

V. Mageshwari

HOD'S Signature
& Name

NEW SYLLABUS

Addition

5%

III B.Sc. Information Technology

SEMESTER –I

For those who joined in 2021 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
USIT	21I6ME3	CLOUD TECHNOLOGY	Lecture	5	5

COURSE DESCRIPTION

This course facilitates the students to understand, analyze the various applications of cloud tool and also provide solutions for cloud security and storage.

COURSE OBJECTIVES

To impart the knowledge about the Computations done in cloud, its architecture and to build their own cloud.

UNITS

UNIT –I UNDERSTANDING CLOUD COMPUTING (14 HRS.)

Origin and Influence- Basic concepts and terminology-goals and benefits-Risks and challenges.fundamental concepts and models: **Roles and Boundaries-Cloud Characteristics-Cloud Delivery Models (Self Study).**

UNIT –II CLOUD ENABLING TECHNOLOGY (14 HRS.)

Broad band Network and Internet Architecture-Data center Technology-Virtualization Technology-Web Technology-Multitenant Technology-**Service Technology (Self Study)**.

UNIT –III FUNDAMENTAL CLOUD SECURITY (14 HRS.)

Basic terms and Concepts-Threat Agents-Cloud Security Threats.**Cloud Infrastructure Mechanism:** Virtual server-cloud storage devices-cloud usage monitor-Resource replication-**readymade Environment(Self Study).**

UNIT –IV SPECIALIZED CLOUD MECHANISMS (14 HRS.)

Automated Scaling Listener-Load balancer-SLA monitor-Pay-per-use monitor-Audit monitor. Hypervisor-**Multi Device Broker-state management database (Self Study)**-Remote Administration System-Resource Management System-SLA Management System-Billing Management System.

UNIT –V CLOUD COMPUTING ARCHITECTURE (14 HRS.)

Workload Distribution Architecture-Resource Pooling Architecture-Cloud Bursting Architecture-Redundant Storage Architecture.ADVANCED CLOUD ARCHITECTURES:Hypervisor clustering architecture-**Load balanced virtual server instances architecture(Self Study)**--Zero downtime architecture-cloud balancing architecture.

UNIT –VI DYNAMISM (Evaluation Pattern-CIA only) (14HRS.)

Virtual server-cloud storage devices.

TEXT BOOK:

2. Erl, Thomas, Ricardo Puttini, and ZaighamMahmood.CLOUD COMPUTING: CONCEPTS, TECHNOLOGY &ARCHITECTURE.Pearson Education, 2013.CHAPTER 3.1-3.4, 4.1-4.4, 5.1-5.6, 6.1-6.3, 7.2-7.6, 8.1-8.10,9.1-9.4,10.1-10.4, 10.5-10.8, 11.1, 11.2, 11.6, 11.8.

REFERENCES:

4. Buyya, Rajkumar, James Broberg, and Andrzej M. Goscinski, eds. Cloud computing: Principles and paradigms. Vol. 87.John Wiley & Sons, 2010.
5. Rhoton, John. "Cloud Computing Explained: Implementation Handbook for Enterprises. 2009." Recursive Limited.

6. Linthicum, David S. Cloud computing and SOA convergence in your enterprise: a step-by-step guide. Pearson Education, 2009.

Digital Open Educational Resources (DOER):

3. Learn Cloud Computing Tutorial - Java point

   https://www.javatpoint.com/cloud-computing-tutorial

4. Cloud Computing Tutorial For Beginners

   https://www.guru99.com/cloud-computing-for-beginners.html

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT – I UNDERSTANDINGCLOUDCOMPUTING				
1.1	Origin and Influence	4	Chalk & Talk	Black Board
1.2	Basic concepts and terminology, goals and benefits	4	Chalk & Talk	Black Board
1.3	Risks and challenges	4	Lecture	PPT& White board
1.4	Roles and Boundaries-Cloud Characteristics-Cloud Delivery Models (Self Study).	2	Discussion	Black Board
UNIT – IICLOUDENABLINGTECHNOLOGY				
2.1	Broad band Network and Internet Architecture	3	Chalk & Talk	Black Board
2.2	Data center Technology	3	Chalk & Talk	Black Board

2.3	Virtualization Technology, Web Technology	4	Lecture	PPT& White board
2.4	Multitenant Technology	2	Lecture	Smart Board
2.5	Service Technology (Self Study)	2	Discussion	Black Board
UNIT – III FUNDAMENTALCLOUDSECURITY				
3.1	Basic terms and Concepts, Threat Agents	3	Chalk & Talk	Black Board
3.2	Cloud Security Threats	3	Chalk & Talk	Black Board
3.3	Cloud InfrastructureMechanism:Virtual server	2	Lecture	PPT& White board
3.4	cloud storage devices, cloud usage monitor	2	Lecture	Smart Board
3.5	Resource replication	2	Chalk & Talk	Black Board
3.6	Readymade Environment (Self Study)	2	Discussion	Black Board
UNIT – IV SPECIALIZEDCLOUDMECHANISMS				
4.1	Automated Scaling Listener, Load balancer	2	Chalk & Talk	Black Board
4.2	SLAmonitor, Pay-per-use monitor, Audit monitor	1	Chalk & Talk	Black Board
4.3	Fail over system, Hypervisor, Resource cluster	2	Chalk & Talk	Black Board
4.4	Multi Device Broker-state management database (Self Study)	1	Lecture	PPT& White board

4.5	Adapter Classes, Inner classes, Anonymous Inner classes	2	Lecture	Smart Board
4.6	Cloud security mechanism**:** Encryption	2	Discussion	Black Board
4.7	Hashing	2	Chalk & Talk	Black Board
4.8	Digitalsignature, Public key Infrastructure	2	Chalk & Talk	Black Board
UNIT – V CLOUD COMPUTING ARCHITECTURE				
5.1	Identity and access management	3	Chalk & Talk	Black Board
5.2	single sign on, Cloud Based security groups	3	Chalk & Talk	Black Board
5.3	Hardened Virtual Server Images	2	Lecture	PPT& White board
5.4	Fundamental cloud architecture	2	Lecture	Smart Board
5.5	Workload Distribution Architecture, Resource Pooling Architecture	2	Discussion	Black Board
5.6	Cloud Bursting Architecture-Redundant Storage Architecture (Self Study)	2	Discussion	Black Board
UNIT –6 DYNAMISM				
6.1	Server less Computing	2	Discussion	Black Board
6.2	Omni-Cloud, Quantum Computing	3	Discussion	Black Board

INTERNAL - UG

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1 10 Mks.	T2 10 Mks.	Quiz 5 Mks.	Assignment 5 Mks	OBT/PPT 5 Mks	35 Mks.	5 Mks.	40Mks.	
K1	2	2	-	-	-	4	-	4	10 %
K2	2	2	5	-	-	9	-	9	22.5 %
K3	3	3	-	-	5	11	-	11	27.5 %
K4	3	3	-	5	-	11	-	11	27.5 %
Non Scholastic	-	-	-	-	-		5	5	12.5 %
Total	10	10	5	5	5	35	5	40	100 %

End Semester - UG

Levels	Section A (i) 5 Mks.	Section A (ii) 5 Mks	Section B 8 Mks.	Section C 12 Mks	Section D 20 Mks.	Section E 10 Mks.	Total 60Mks.	
K1	5	5	-	4	-	-	14	23.33 %
K2	-	-	8	4	-	-	12	20 %
K3	-	-	-	-	20	-	20	33.33 %
K4	-	-	-	4	-	10	14	23.34 %
Total	5	5	8	12	20	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

UG CIA Components

			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	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 fundamental concepts of cloud service and deployment models.	K1& K2	PSO1& PSO2
CO 2	Identify the importance of virtualization along with their technologies.	K1& K2	PSO3
CO 3	Analyze different cloud computing Services.	K3 & K4	PSO6
CO 4	Analyze the components and the security in cloud.	K3 & K4	PSO6
CO 5	Illustrate different design & develop backup strategies for cloud data based on features.	K3 & K4	PSO6, PSO7 & PSO8

Mapping of COs with PSOs

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

Mapping of C0s with POs

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

Note: ♦ Strongly Correlated – **3** ♦ Moderately Correlated – **2**
♦ Weakly Correlated -**1**

COURSE DESIGNER:

1. **Staff Name: MRS. T. LEENA PREMA KUMARI**

V. Mageshwari

HOD'S Signature
& Name

OLD SYLLABUS

III B.Sc. Information Technology

SEMESTER – VI

For those who joined in 2019 onwards

Changes

5%

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
USIT	19I6ME5	INFORMATION STORAGE MANAGEMENT	Lecture	5	5

COURSE DESCRIPTION

This course provides a comprehensive understanding of the various storage infrastructure components in classic and virtual environments. It enables the students to make informed decisions in an increasingly complex IT environment.

COURSE OBJECTIVES

To impart the comprehensive understanding of all segments of Storage Technologies.

UNITS

UNIT –I STORAGE SYSTEM (14HRS.)

Introduction to Information Storage and Management: Information storage – Evolution of Storage Architecture – Data Center Infrastructure – Virtualization and Cloud Computing – Data Center Environment: Application – DBMS – Host – **Connectivity (Self Study).**

UNIT –II DATA PROTECTION (14 HRS.)

RAID: RAID Implementation methods – RAID Array Components – RAID Techniques – RAI levels.Intelligent Storage System: Components of an Intelligent Storage System – **Storage Provisioning (Self Study).**

UNIT –III STORAGE NETWORKING TECHNOLOGIES (14 HRS.)

Fibre Channel Storage area Networks: Fibre Channel: Overview - The SAN and Its Evolution – Components of FC SAN – Network Attached Storage: General Purpose Servers Vs NAS Devices – Benefits of NAS – **File System and Network File Sharing (Self Study)**– Components of NAS.

UNIT –IV BACKUP, ARCHIVE AND REPLICATION (14 HRS.)

Backup and Archive: Backup Purpose – Backup Considerations – Backup Granularity - Recovery Considerations – Backup Methods – Backup Architecture – Backup and Restore Operations – **Data Archive(Self Study)** – Archiving Solution Architecture

UNIT –V SECURING AND MANAGING STORAGE INFRASTRUCTURE

(14 HRS.)

Securing the Storage Infrastructure: Information Security Framework – Risk Triad- Storage Security Domains- Managing the Storage infrastructure: **Monitoring the Storage Infrastructure(Self Study).**

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

Latest storage device (Cloud, SSD(solid-state drive), NVMe (Non-Volatile Memory Express).

TEXT BOOK:

1. Somasundaram, Gnanasundaram, and AlokShrivastava, eds. Information storage and management: storing, managing, and protecting digital information in classic, virtualized, and cloud

environments. John Wiley & Sons, 2012.Chapters - 1.1 – 1.4, 2.1 – 2.4, 3.1-3.4, 4.1- 4.2, 5.1-5.3, 7.1-7.4, 10.1 – 10.7, 10.13, 10.14, 14.1 – 14.3, 15.1

REFERENCES:

1. Robert Spalding, “Storage Networks ” The Complete Reference, Tata McGraw Hill, 2003
2. Marc Fairley, “Building Storage Networks”, Tata McGraw Hill, 2001

WEB REFERNCES :

1. Management Information System Tutorial

   https://www.tutorialspoint.com/management_information_system/index.htm

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 STORAGE SYSYEM				
1.1	Introduction to Information Storage and Management: Information storage	3	Chalk & Talk	Black Board
1.2	Evolution of Storage Architecture	3	Chalk & Talk	LCD
1.3	Data Center Infrastructure, Virtualization and Cloud Computing	3	Lecture	PPT& White board
1.4	Data Center Environment: Application DBMS, Host	3	Lecture	Smart Board
1.5	Connectivity (Self Study)	2	Discussion	Black Board
UNIT -2 DATA PROTECTION				

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
2.1	RAID: RAID Implementation methods, RAID Array Components	4	Lecture	PPT& White board
2.2	RAID Techniques – RAID levels	4	Lecture	PPT& White board
2.3	Intelligent Storage System: Components of an Intelligent Storage System	4	Discussion	Black Board
2.4	Storage Provisioning (Self Study)	2	Discussion	Black Board
UNIT -3 STORAGE NETWORKING TECHNOLOGIES				
3.1	Fibre Channel Storage area Networks: Fibre Channel-Overview	2	Chalk & Talk	Black Board
3.2	The SAN and Its Evolution	2	Discussion	Google classroom
3.3	Components of FC SAN	2	Lecture	Black Board
3.4	Network Attached Storage: General Purpose Servers Vs NAS Devices	3	Lecture	PPT& White board
3.5	Benefits of NAS	2	Chalk & Talk	Black Board
3.6	File System and Network File Sharing (Self Study)	1	Discussion	Google classroom
3.7	Components of NAS	2	Chalk & Talk	Black Board
UNIT – 4 BACKUP, ARCHIVE AND REPLICATION				
4.1	Backup and Archive: Backup Purpose	2	Lecture	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
4.2	Backup Considerations, Backup Granularity	2	Chalk & Talk	Black Board
4.3	Recovery Considerations, Backup Methods	2	Lecture	Black Board
4.4	Backup Architecture	2	Chalk & Talk	Black Board
4.5	Backup and Restore Operations	2	Discussion	Google classroom
4.6	Data Archive (Self Study)	2	Lecture	PPT& White board
4.7	Archiving Solution Architecture	2	Discussion	Google classroom
UNIT -5 SECURING AND MANAGING STORAGE INFRASTRUCTURE				
5.1	Securing the Storage Infrastructure: Information Security Framework	5	Lecture	Black Board
5.2	Risk Triad- Storage Security Domains	5	Lecture	PPT& White board
5.3	Managing the Storage infrastructure	3	Chalk & Talk	Black Board
5.4	Monitoring the Storage Infrastructure (Self Study)	1	Discussion	Google classroom
UNIT –6 DYNAMISM				
6.1	Cloud, SSD(solid-state drive)	2	Discussion	Black Board
6.2	NVMe (Non-Volatile Memory Express	3	Discussion	Black Board

INTERNAL - UG

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1 10 Mks.	T2 10 Mks.	Quiz 5 Mks.	Assignment 5 Mks	OBT/PPT 5 Mks	35 Mks.	5 Mks.	40Mks.	
K1	2	2	-	-	-	4	-	4	10 %
K2	2	2	5	-	-	9	-	9	22.5 %
K3	3	3	-	-	5	11	-	11	27.5 %
K4	3	3	-	5	-	11	-	11	27.5 %
Non Scholastic	-	-	-	-	-		5	5	12.5 %
Total	10	10	5	5	5	35	5	40	100 %

End Semester - UG

Levels	Section A (i) 5 Mks.	Section A (ii) 5 Mks	Section B 8 Mks.	Section C 12 Mks	Section D 20 Mks.	Section E 10 Mks.	Total 60Mks.	
K1	5	5	-	4	-	-	14	23.33 %
K2	-	-	8	4	-	-	12	20 %
K3	-	-	-	-	20	-	20	33.33 %
K4	-	-	-	4	-	10	14	23.34 %
Total	5	5	8	12	20	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

UG CIA Components

			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	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	Know the concepts of Storage and Data structure Environment based on growth and challenges in IT.	K1& K2	PSO1& PSO2
CO 2	Understand data protection by using related and recent techniques.	K1& K2	PSO1& PSO2
CO 3	Identify the parameters of managing and monitoring the storage infrastructure and manage the solutions.	K1, K2 & K3	PSo3 & PSO4
CO 4	Know backup and archival data in both classic and virtualized environment.	K1& K2	PSO6
CO 5	Analyze, Monitoring and managing the storage infrastructure in cloud environments.	K3& K4	PSO7 & PSO8

Mapping of C0s with PSOs

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

Mapping of C0s with POs

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

Note: ♦ Strongly Correlated – **3** ♦ Moderately Correlated – **2**
♦ Weakly Correlated -**1**

COURSE DESIGNER:

1. **Staff Name: MRS. T. CHARANYA NAGAMMAL**

Forwarded By

V. Mageshwari

HOD'S Signature

& Name

NEW SYLLABUS

Addition

5%

III B.Sc. Information Technology

SEMESTER – VI

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
USIT	19I6ME5	INFORMATION STORAGE MANAGEMENT	Lecture	5	5

COURSE DESCRIPTION

This course provides a comprehensive understanding of the various storage infrastructure components in classic and virtual environments. It enables the students to make informed decisions in an increasingly complex IT environment.

COURSE OBJECTIVES

To impart the comprehensive understanding of all segments of Storage Technologies.

UNITS

UNIT –I STORAGE SYSTEM (14HRS.)

Introduction to Information Storage and Management: Information storage – Evolution of Storage Architecture – Data Center Infrastructure – Virtualization and Cloud Computing – Data Center Environment: Application – DBMS – Host – Storage – computing power, application connections - **Connectivity (Self Study).**

UNIT –II DATA PROTECTION (14 HRS.)

RAID: RAID Implementation methods – RAID Array Components – RAID Techniques – RAI levels.Intelligent Storage System: Components of an Intelligent Storage System – **Storage Provisioning (Self Study).**

UNIT –III STORAGE NETWORKING TECHNOLOGIES (14 HRS.)

Fibre Channel Storage area Networks: Fibre Channel: Overview - The SAN and Its Evolution – Components of FC SAN – Network Attached Storage: General Purpose Servers Vs NAS Devices – Benefits of NAS – **File System and Network File Sharing (Self Study)**– Components of NAS.

UNIT –IV BACKUP, ARCHIVE AND REPLICATION (14 HRS.)

Backup and Archive: Backup Purpose – Backup Considerations – Backup Granularity - Recovery Considerations – Backup Methods – Backup Architecture – Backup and Restore Operations – **Data Archive(Self Study)** – Archiving Solution Architecture

UNIT –V SECURING AND MANAGING STORAGE INFRASTRUCTURE

(14 HRS.)

Securing the Storage Infrastructure: Information Security Framework – Risk Triad- Storage Security Domains-Security implementation in storage networking- Managing the Storage infrastructure: **Monitoring the Storage Infrastructure(Self Study).**

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

Latest storage device (Cloud, SSD(solid-state drive), NVMe (Non-Volatile Memory Express).

TEXT BOOK:

2. Somasundaram, Gnanasundaram, and AlokShrivastava, eds. Information storage and management: storing, managing, and

protecting digital information in classic, virtualized, and cloud environments. John Wiley & Sons, 2012.Chapters - 1.1 – 1.4, 2.1 – 2.4, 3.1-3.4, 4.1- 4.2, 5.1-5.3, 7.1-7.4, 10.1 – 10.7, 10.13, 10.14, 14.1 – 14.3, 15.1

REFERENCES:

1. Robert Spalding, “Storage Networks ” The Complete Reference, Tata McGraw Hill, 2003
3. Marc Fairley, “Building Storage Networks”, Tata McGraw Hill, 2001

WEB REFERNCES :

2. Management Information System Tutorial

   https://www.tutorialspoint.com/management_information_system/index.htm

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 STORAGE SYSYEM				
1.1	Introduction to Information Storage and Management: Information storage	3	Chalk & Talk	Black Board
1.2	Evolution of Storage Architecture	3	Chalk & Talk	LCD
1.3	Data Center Infrastructure, Virtualization and Cloud Computing	3	Lecture	PPT& White board
1.4	Data Center Environment: Application DBMS, Host	3	Lecture	Smart Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
1.5	Connectivity (Self Study)	2	Discussion	Black Board
UNIT -2 DATA PROTECTION				
2.1	RAID: RAID Implementation methods, RAID Array Components	4	Lecture	PPT& White board
2.2	RAID Techniques – RAID levels	4	Lecture	PPT& White board
2.3	Intelligent Storage System: Components of an Intelligent Storage System	4	Discussion	Black Board
2.4	Storage Provisioning (Self Study)	2	Discussion	Black Board
UNIT -3 STORAGE NETWORKING TECHNOLOGIES				
3.1	Fibre Channel Storage area Networks: Fibre Channel-Overview	2	Chalk & Talk	Black Board
3.2	The SAN and Its Evolution	2	Discussion	Google classroom
3.3	Components of FC SAN	2	Lecture	Black Board
3.4	Network Attached Storage: General Purpose Servers Vs NAS Devices	3	Lecture	PPT& White board
3.5	Benefits of NAS	2	Chalk & Talk	Black Board
3.6	File System and Network File Sharing (Self Study)	1	Discussion	Google classroom
3.7	Components of NAS	2	Chalk & Talk	Black Board
UNIT – 4 BACKUP, ARCHIVE AND REPLICATION				

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
4.1	Backup and Archive: Backup Purpose	2	Lecture	Black Board
4.2	Backup Considerations, Backup Granularity	2	Chalk & Talk	Black Board
4.3	Recovery Considerations, Backup Methods	2	Lecture	Black Board
4.4	Backup Architecture	2	Chalk & Talk	Black Board
4.5	Backup and Restore Operations	2	Discussion	Google classroom
4.6	Data Archive (Self Study)	2	Lecture	PPT& White board
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5.1	Securing the Storage Infrastructure: Information Security Framework	5	Lecture	Black Board
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CO2	2	3	2	2	2	2	2	1
CO3	2	2	2	3	2	2	2	2
CO4	2	2	3	2	2	2	2	2
CO5	2	2	2	2	2	3	1	1

Mapping of COs with POs

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

Note: ♦ Strongly Correlated – **3** ♦ Moderately Correlated – **2**
♦ Weakly Correlated -**1**

COURSE DESIGNER:

1. **Staff Name: MRS. T. CHARANYA NAGAMMAL**

Forwarded By

V. Mageshwari

HOD'S Signature
& Name