H.H. THE RAJAH'S COLLEGE(AUTO.0, PUDUKKOTTAI
P.G. AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE
B.Sc., COMPUTER SCIENCE [2021 -2022 ONWARDS]

S.No.	SEM	PAPER	SUB.CODE	SUBJECT	HOURS/ WEEK	CREDIT	EXAM HOURS	MARKS		
								IE	EX	TOT
1	I	LC-I	21ULT1/ 21ULH1	LANGUAGE PAPER - I	6	3	3	25	75	100
2	I	ELC-I	21ULE1	ENGLISH PAPER - I	6	3	3	25	75	100
3	I	CC-I	21UCS1	PROGRAMMING IN C	6	5	3	25	75	100
4	I	CP-II	21UCS2P	PROGRAMMING IN C LAB	3	3	3	40	60	100
5	I	AC-I	21UCMA1	APPLIED MATHS PAPER - I	5	5	3	25	75	100
6	I	SBE-I	21USBE1	SOFT SKILLS - PAPER - I	2	-	-	-	-	-
7	I	EVS	21UES	ENVIRONMENTAL STUDIES	2	2	3	25	75	100
					30	**21**				**600**
8	II	LC-II	21ULT2 /21ULH2	LANGUAGE PAPER - II	6	3	3	25	75	100
9	II	ELC-II	21ULE2	ENGLISH PAPER - II	6	3	3	25	75	100
10	II	CC-III	21UCS3	BASICS OF JAVA PROGRAMMING	6	5	3	25	75	100
11	II	CP-IV	21UCS4P	BASICS OF JAVA PROGRAMMING LAB	3	3	3	40	60	100
12	II	AC-II	21UCMA2	APPLIED MATHS PAPER - II	5	5	3	25	75	100
13	II	VE	21UVE	VALUE EDUCATION	2	2	3	25	75	100
14	II	SBE-I	21USBE1	SOFT SKILLS - PAPER - I	2	4	3	25	75	100
					30	**25**				**700**
15	III	LC-III	21ULT3/ 21ULH3	LANGUAGE PAPER - III	6	3	3	25	75	100
16	III	ELC-III	21ULE3	ENGLISH PAPER - III	6	3	3	25	75	100
17	III	CC-V	21UCS5	DATABASE SYSTEM CONCEPTS	6	5	3	25	75	100
18	III	CP-VI	21UCS6P	RDBMS LAB	4	3	3	40	60	100
19	III	AC-III	21UCPA3	APPLIED PHYSICS	3		-	-	-	-
20	III	AP-IV	21UCPA4P	APPLIED PHYSICS LAB	3					
21	III	NME-I	21UELN1	ADVANCED SKILLS FOR COMMUNICATION IN ENGLISH	2	2	3	25	75	100
					OBJECTIVE TYPE					
					30	**16**				**500**
22	IV	LC-IV	21ULT4/ 21ULH4	LANGUAGE PAPER - IV	6	3	3	25	75	100

23	IV	ELC-IV	21ULE4	ENGLISH PAPER - IV	6	3	3	25	75	100
24	IV	CC-VII	21UCS7	PROGRAMMING IN VB.NET	5	5	3	25	75	100
25	IV	CP-VIII	21UCS8P	PROGRAMMING IN VB.NET LAB	3	3	3	40	60	100
26	IV	AC-III	21UCPA3	APPLIED PHYSICS	3	5	3	25	75	100
27	IV	AP-IV	21UCPA4P	APPLIED PHYSICS LAB	3	5	3	40	60	100
28	IV	SBE-II	21USBE2	SOFT SKILLS - PAPER - II	4	4	3	25	75	100
					30	**28**				**700**
29	V	CC-IX	21UCS9	OPERATING SYSTEM CONCEPTS	6	5	3	25	75	100
30	V	CP-X	21UCS10P	LINUX LAB	6	4	3	40	60	100
31	V	CC-XI	21UCS11	INTERNET OF THINGS	6	5	3	25	75	100
32	V	EC-I	21UCSE1A	DATA COMMUNICATION AND NETWORKS (OR)	6	5	3	25	75	100
			21UCSE1B	WORKING PRINCIPLES OF INTERNET						
			21UCSE1C	DIGITAL COMPUTER FUNDAMENTALS & ARCHITECTURE						
33	V	NME-II	21UCON2	COMMERCE : INVESTMENT BASICS	2	2	3	25	75	100
34	V	SBE-III	21USBE3	SOFT SKILLS - PAPER - III	4	4	3	25	75	100
					30	**25**				**600**
35	VI	CC-XII	21UCS12	WEB PROGRAMMING USING PHP AND MYSQL	6	5	3	25	75	100
36	VI	CP-XIII	21UCS13P	PHP AND MYSQL LAB	4	4	3	40	60	100
37	VI	CC-XIV	21UCS14	MICROPROCESSOR AND ITS APPLICATIONS	6	5	3	25	75	100
38	VI	EC-II	21UCSE2A	DATA STRUCTURES (OR)	6	5	3	25	75	100
			21UCSE2B	SOFTWARE ENGINEERING(OR)						
			21UCSE2C	SOFTWARE PROJECT MANAGEMENT						
39	VI	EC-III	21UCSE3A	DATA MINING (OR)	6	4	3	25	75	100
			21UCSE3B	SYSTEM ANALYSIS AND DESIGN(OR)						
			21UCSE3C	INTRODUCTION TO SYSTEM PROGRAMMING						
40	VI	GS	21UGS	GENDER STUDIES	2	1	3	25	75	100
41	VI			EXTENSION ACTIVITY		1				
					30	**25**				**600**
TOTAL					**156**	**118**				**3100**

H.H. THE RAJAH'S COLLEGE(AUTONOMOUS), PUDUKKOTTAI
B.Sc., (COMPUTER SCIENCE) - COURSE STRUCTURE UNDER CBCS
(FOR THE CANDIDATES ADMITTED FROM THE ACADEMIC YEAR 2021- 2022 ONWARDS)
CORE COURSES (14)

SL. No.	SUB. CODE	CODE	TITLE OF THE PAPER	CREDIT
1	21UCS1	CC-I	PROGRAMMING IN C	5
2	21UCS2P	CP-II	PROGRAMMING IN C LAB	3
3	21UCS3	CC-III	BASICS OF JAVA PROGRAMMING	5
4	21UCS4P	CP-IV	BASICS OF JAVA PROGRAMMING LAB	3
5	21UCS5	CC-V	DATABASE SYSTEM CONCEPTS	5
6	21UCS6P	CP-VI	RDBMS LAB	3
7	21UCS7	CC-VII	PROGRAMMING IN VB.NET	5
8	21UCS8P	CP-VIII	PROGRAMMING IN VB.NET LAB	3
9	21UCS9	CC-IX	OPERATING SYSTEM CONCEPTS	5
10	21UCS10P	CP-X	LINUX LAB	4
11	21UCS11	CC-XI	INTERNET OF THINGS	5
12	21UCS12	CC-XII	WEB PROGRAMMING USING PHP AND MYSQL	5
13	21UCS13P	CP-XIII	PHP AND MYSQL LAB	4
14	21UCS14	CC-XIV	MICROPROCESSOR AND ITS APPLICATIONS	5
				60
ELECTIVE COURSES (3)				
1	21UCSE1A	EC-I	DATA COMMUNICATION AND NETWORKS(OR)	5
	21UCSE1B		WORKING PRINCIPLES OF INTERNET(OR)	
	21UCSE1C		DIGITAL COMPUTER FUNDAMENTALS & ARCHITECTURE	
2	21UCSE2A	EC-II	DATA STRUCTURES (OR)	5
	21UCSE2B		SOFTWARE ENGINEERING (OR)	
	21UCSE2C		SOFTWARE PROJECT MANAGEMENT	
3	21UCSE3A	EC-III	DATA MINING (OR)	4
	21UCSE3B		SYSTEM ANALYSIS AND DESIGN(OR)	
	21UCSE3C		INTRODUCTION TO SYSTEM PROGRAMMING	
				14
SKILL BASED ELECTIVE COURSES (3)				
1	21USBE1	SBE-I	SOFT SKILLS - PAPER - I	4
2	21USBE2	SBE-II	SOFT SKILLS - PAPER - II	4
3	21USBE3	SBE-III	SOFT SKILLS - PAPER - III	4
				12
ALLIED COURSES (4)				
1	21UCMA1	AC-I	APPLIED MATHS PAPER - I	5
2	21UCMA2	AC-II	APPLIED MATHS PAPER - II	5
3	21UCPA3	AC-III	APPLIED PHYSICS	5
4	21UCPA4P	AP-IV	APPLIED PHYSICS LAB	5
				20
NON-MAJOR ELECTIVE COURSES (2)				
1	21UELN1	NME-I	ADVANCED SKILLS FOR COMMUNICATION IN ENGLISH	2
2	21UCON2	NME-II	COMMERCE : INVESTMENT BASICS	2
				4
1	21UES	EVS	ENVIRONMENTAL STUDIES	2
2	21UVE	VE	VALUE EDUCATION	2
3	21UGS	GS	GENDER STUDIES	1
TOTAL CREDITS				**55**
PART - V : EXTRA CURICULAR ACTIVITY				1
PART - I & PART - II				24

H.H. THE RAJAH'S COLLEGE(AUTO.), PUDUKKOTTAI
PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

B.Sc., Computer Science [2021 -2022 Onwards]

S.No.	SEM	PAPER	SUB.CODE	SUBJECT	PAPER		
					NEW	REVISED	RETAINED
1	I	CC-I	21UCS1	PROGRAMMING IN C		✓	
2	I	CP-II	21UCS2P	PROGRAMMING IN C LAB		✓	
3	II	CC-III	21UCS3	BASICS OF JAVA PROGRAMMING		✓	
4	II	CP-IV	21UCS4P	BASICS OF JAVA PROGRAMMING LAB	✓		
5	III	CC-V	21UCS5	DATABASE SYSTEM CONCEPTS	✓		
6	III	CP-VI	21UCS6P	RDBMS LAB			✓
7	III	NME-I	21UELN1	ADVANCED SKILLS FOR COMMUNICATION IN ENGLISH	✓		
8	IV	CC-VII	21UCS7	PROGRAMMING IN VB.NET			✓
9	IV	CP-VIII	21UCS8P	PROGRAMMING IN VB.NET LAB			✓
10	V	CC-IX	21UCS9	OPERATING SYSTEM CONCEPTS	✓		
11	V	CP-X	21UCS10P	LINUX LAB	✓		
12	V	CC-XI	21UCS11	INTERNET OF THINGS	✓		
13	V	EC-I	21UCSE1A	DATA COMMUNICATION AND NETWORKS (OR)			✓
			21UCSE1B	WORKING PRINCIPLES OF INTERNET	✓		
			21UCSE1C	DIGITAL COMPUTER FUNDAMENTALS & ARCHITECTURE	✓		
14	V	NME-II	21UCON2	COMMERCE : INVESTMENT BASICS	✓		
15	VI	CC-XII	21UCS12	WEB PROGRAMMING USING PHP AND MYSQL	✓		
16	VI	CP-XIII	21UCS13P	PHP AND MYSQL LAB	✓		
17	VI	CC-XIV	21UCS14	MICROPROCESSOR AND ITS APPLICATIONS			✓
18	VI	EC-II	21UCSE2A	DATA STRUCTURES (OR)			✓
			21UCSE2B	SOFTWARE ENGINEERING	✓		
			21UCSE2	SOFTWARE PROJECT MANAGEMENT	✓		
19	VI	EC-III	21UCSE3A	DATA MINING (OR)		✓	
			21UCSE3B	SYSTEM ANALYSIS AND DESIGN			✓
			21UCSE3C	INTRODUCTION TO SYSTEM PROGRAMMING	✓		
% of Change					**59**	**15**	**26**

BLOOM'S TAXONOMY BASED ASSESSMENT PATTERN

K1-Remember; **K2**- Understanding; **K3**- Apply; **K4**-Analyze; **K5**- Evaluate

1. Part I, II & III-Theory: 75Marks

Knowledge Level	Section	Marks	Description	Total
K1	A (Answer All)	10 × 2 = 20	Very Short Answers	75
K2	B (Either or Pattern)	5 × 5 = 25	Short answers	
K3 & K4	C (Answer 3 out of 5)	3 × 10 = 30	Descriptive/Detailed	

2. Practical Examinations: 60 Marks

Knowledge Level	Section		Total
	Practical	Record work	
K3	50	10	60
K4			
K5			

PROGRAMME OUTCOMES (PO)

Programme Outcomes are narrower statements that describe the capabilities the students are expected to have by the time of graduation. On completion of the Post graduate Degree Programmes the student would be able to acquire the following Programme Outcomes (POs):

i. **Disciplinary knowledge**: Capable of demonstrating comprehensive knowledge and understanding of one or more disciplines that form a part of an undergraduate programmer of study.

ii. **Communication Skills**: Ability to express thoughts and ideas effectively in writing and orally; Communicate with others using appropriate media; confidently share one's views and express herself/himself; demonstrate the ability to listen carefully, read and write analytically, and present complex information in a clear and concise manner to different groups.

iii. **Critical thinking, Problem solving and Analytical reasoning** : Capability to apply analytic thought to a body of knowledge; analyses and evaluate evidence, arguments, claims, beliefs on the basis of empirical evidence; identify relevant assumptions or implications; formulate coherent arguments; critically evaluate practices, policies and theories, philosophies

iv. **Acquiring research-related skills, scientific reasoning and reflective thinking**: A sense of inquiry and capability for asking relevant/appropriate questions; ability to recognize cause-and-effect relationships, define problems, formulate and test hypotheses, analyses, interpret and draw conclusions from data; ability to plan, execute and report the results of an experiment or investigation.

v. **Multicultural competence with moral and ethical awareness/ reasoning**: Possess knowledge of the values and beliefs of multiple cultures and a global perspective; capability to effectively engage in a multicultural society and interact respectfully with diverse groups; ability to embrace moral/ethical values in one's life and career.

vi. **Cooperation/Team work with leadership qualities**: Ability to work effectively and respectfully with diverse teams; facilitate cooperative or coordinated effort on the part of a group, and act together as a group or a team in the interests of a common cause and work efficiently as a member of a team.

vii. **Self-directed lifelong learning with information/digital literacy**: Capability to use ICT in a variety of learning situations; ability to work independently, identify appropriate resources required for a project; ability to acquire knowledge and skills, through self-paced and self-directed learning aimed at personal development.

Program Specific Outcomes

On successful completion of B.Sc. Computer Science Programme, the students would be able to

PSO 1: understand the basic concepts involved in computing

PSO 2: share the ideas and the techniques they have learnt

PSO 3: apply the knowledge in Computer techniques to solve real world problems

PSO 4: think of new approaches for solving problems in different domains

PSO 5: follow ethics in designing software

Course Code	21UCS1	PROGRAMMING IN C	TOTAL HOURS	CREDITS
			6	5
Core/~~Elective/Supportive~~		Core Course - I	Syllabus Version	2021-2022

Course Objectives:

- To impart basic knowledge of programming in C.
- Enable students to develop programmes using C language.

Unit:1

History of C – Importance of C – Basic Structure of C Programs – Constants, Variables and Data Types – Operators and Expressions – Managing Input and Output Operations.

Unit:2

Decision Making and Branching – Decision Making with IF Statement – Simple IF Statement – The IF … ELSE Statement – Nesting of IF … ELSE Statements – The ELSE IF Ladder – The Switch Statement – The ?: Operator – The GOTO Statement – Decision Making and Looping – The WHILE Statement – The DO Statement – The FOR Statement.

Unit:3

Arrays – One-Dimensional Arrays – Two-Dimensional Arrays – Multi-dimensional Arrays – Character Arrays and Strings – Declaring and Initializing String Variables – Reading and Writing Strings – Arithmetic Operations on Characters – Comparison of Two Strings – String-handling Functions.

Unit:4

User-Defined Functions – Function Declaration – Category of Functions – Nesting of Functions – Recursion – Storage Classes.

Unit:5

Structures and Union – Arrays of Structures – Arrays within Structures – Structures within Structures – Structures and Functions – Unions.

Course Outcomes:

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

CO1: Students learn about the, fundamental of programming language. Know the concept of variable, data types, operators, Expressions.
CO2: Know the concept of control structures and Looping statements.
CO3: Learn to create arrays and its types.

CO4: They learn about functions, strings and storage classes. CO5: Gain the knowledge about structure and unions in C	
Text Book	
1	E. Balagurusamy, **Programming in ANSI C**, Tata McGraw Hill Education Private Ltd., Sixth Edition, 2013. **Unit I:** Chapter 1 (Sections 1.1, 1.2, 1.8), Chapters 2, 3 & 4 **Unit II:**Chapter 5 & Chapter 6 (Sections 6.1 to 6.4) **Unit III:**Chapter 7 (Sections 7.1 to 7.7) & Chapter 8 (Sections 8.1 to 8.8) **Unit IV:**Chapter 9 **Unit V:**Chapter 10 (Sections 10.1 to 10.12)
Reference Book	
1	R.S. Bichkar, Programming with C, University Press, 2012
Online Web Reference	
1	https://www.programiz.com/c-programming

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	9	9	9	9	9
CO2	9	1	3	3	9
CO3	9	3	1	1	9
CO4	9	1	1	1	9
CO5	9	1	1	9	9
Weightage	45	15	15	23	45
Weightage Percentage of Course Contribution of PO's	8.75	4.21	4.25	5.82	9.22

Level of Correlation 1-**Low** 3-**Medium** 9-**High**

Course Code	21UCS2P	PROGRAMMING IN C LAB	TOTAL HOURS	CREDITS
			6	5
Core/~~Elective/Supportive~~		Core Course - Practical	Syllabus Version	2021-2022

Course Objectives:

- Demonstrate the execution of C programs.
- Build programs with the appropriate statements to solve problems.

LIST OF LAB PROGRAMS

1. Convert temperature from Centigrade to Fahrenheit.
2. Find whether the given number is Even or Odd.
3. Find the greatest of three numbers.
4. Display Monday to Sunday using switch statement.
5. Display first ten natural numbers and their sum.
6. Multiply two matrices.
7. Find the maximum number in an Array.
8. Reverse an integer number.
9. Perform string manipulation
10. Solve Quadratic Equation using functions.
11. Find factorial of a number using Recursion.
12. Exhibit difference between Call by Value and Call by Reference.
13. Write program using Structure and Union.

Course Outcomes:

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

CO1: Remember basic data types, operators and to write simple programs using them.
CO2: Understand the conditional statements & loops for creating programs.
CO3: Apply the concept of arrays programs.
CO4: Develop programs for implementation of Function.
CO5: Gain skills to write programs using String functions, Structures.

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	9	9	1	1	9
CO2	9	9	3	3	9
CO3	3	1	9	1	9
CO4	9	1	1	9	9
CO5	3	1	1	1	9
Weightage	33	21	15	15	45
Weightage Percentage of Course Contribution of PO's	6.42	5.90	4.25	3.80	9.22

Level of Correlation 1-**Low** 3-**Medium** 9-**High**

Course Code	21UCS3	BASICS OF JAVAPROGRAMMING	TOTAL HOURS	CREDITS
			6	5
Core/~~Elective/Supportive~~		Core Course - III	Syllabus Version	2021-2022

Course Objectives:

- To comprehend the fundamental concepts of Object Oriented Programming with Java language
- Enable students to develop programmes using Java language.

Unit:1

Fundamentals of Object Oriented Programming: Introduction – Object Oriented Paradigm – Basic Concepts of OOP – Benefits of OOP – Applications of OOP. Java Evolution Java History – Java Features – Java and Internet – World Wide Web – Web Browsers – H/W and S/W requirements – Java Support Systems – Java Environment. Overview of Java language Introduction – Simple Java Program – Comments – Java Program Structure – Tokens – Java Statements – Implementing a Java Program – JVM – Command Line Arguments. Constants – Variables – Data Types – Type Casting.

Unit:2

Operators and Expressions: Arithmetic Operators – Relational, Logical, Assignment, Increment and Decrement, Conditional, Bitwise, Special Operators – Arithmetic expressions, Evaluation of expression – Precedence of Arithmetic Operators – Type Conversions – Operator Precedence and associatively – Mathematical Functions. Decision Making and Branching If – if…..else – Nesting of if……. Else – else if – switch - ?: operator. Decision Making and Looping, While – do while – for loops– jump in loops – labelled loops.

Unit:3

Classes, Objects and Methods: Defining a class – Adding variables, methods – Creating objects – Accessing Class Members– Constructors – Methods overloading – static members – Nesting of Methods – Inheritance – Overriding methods – final Variables and methods – Final classes – finalize method – Abstract methods and classes – visibility control. Arrays, Strings and Vectors: Arrays – One Dimensional Arrays – Creating an array – Two Dimensional Arrays – Strings – Vectors.

Unit:4

. **Wrapper Classes Interfaces:** Multiple Inheritance - Defining interfaces – Extending interfaces – implementing interfaces – Accessing interface variables. Packages: Java API Packages – Using system packages – Naming conventions – Creating Packages – Accessing a Package – Using a Package – Adding a Class to a Package – hiding classes.

Unit:5

Multithreaded Programming: Creating Threads – Extending the Thread Class – Stopping and Blocking a Thread – Life Cycle of a Thread – Using Thread methods – Thread Exceptions – Thread Priority - Implementing the 'Runnable' Interface -Managing Errors and Exceptions - Types of errors – Exceptions – Syntax of Exception handling code – Multiple Catch Statements – Using finally statement – Throwing our own Exceptions.

Course Outcomes:

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

CO1: To give basic knowledge of Object Oriented Programming paradigm and to impart the programming skills in JAVA.

CO2: Knowledge on the basic java language features, types and control structures.

CO3: Use the java programming language for various programming technologies.

CO4: Understand the idea inheritance and packages. Propose the use of certain technology by implementing them in the Java programming language to solve the given problem.

CO5: Know exception handling, threads are used to perform sub tasks and interthread communication.

Text Book

1	**"Programming with JAVA"**, Second Edition 2006", E. Balagurusamy, TATA McGraw-Hill Publishing Company Limited, New Delhi **UNIT I:** Chapters: 1, 2, 3, 4 **UNIT II:** Chapters: 5, 6, 7 **UNIT III:** Chapters: 8, 9 **UNIT IV:** Chapters: 10, 11 **UNIT V:** Chapters: 12, 13

Reference Books

1	"Java 2 – The Complete Reference", Fifth Edition, 2006 Herbert Schildt, TATA Mc Graw Hill Publishing Company Limited, New Delhi.
2	"Java – How to Program", Sixth Edition 2005, H.M. Deitel, P.J.Deitel, Pearson Education Pvt. Ltd, Delhi.

Online Web Reference

1	• http://www.learnjavaonline.org/

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	9	1	1	1	9
CO2	9	3	3	1	9
CO3	1	1	9	1	3
CO4	9	1	1	9	9
CO5	3	9	1	1	1
Weightage	31	15	15	13	31
Weightage Percentage of Course Contribution of PO's	6.03	4.21	4.25	3.29	6.35

Level of Correlation 1-**Low** 3-**Medium** 9-**High**

Course Code	21UCS4P	BASIC JAVA PROGRAMMING LAB	TOTAL HOURS	CREDITS
			3	3
Core/~~Elective/Supportive~~		Core Course Practical - IV	Syllabus Version	2021-2022

Course Objectives:

- Demonstrate the execution of Java programs.
- Build programs with the appropriate statements to solve problems.

LIST OF LAB PROGRAMS

1. Write a Java program to find greatest of three numbers.
2. Write a Java program to calculate factorial of a number using command line arguments.
3. Write a Java program to read a set of numbers in an array & to find the sum and average of them.
4. Write a Java program to maintain the student record containing roll number, Name, Marks1, Marks2, Marks3 as data members and getdata(), display() and setdata() as member functions.
5. Write a Java program to increment the employee salaries on the basis of their designation (Manager – 5000, General Manager – 10000, CEO – 20000, worker – 2000). Use employee name, id, designation and salary as data members and inc_sal() as member function
6. Write a Java program using a class bank, containing data members: Name of the Depositor, A/c number, Type of A/c, Balance amount. Member functions: To assign initial value, to deposit amount, to withdraw amount after checking the balance (which should be greater than Rs.500), to display name & balance.
7. Write a Java program to design three classes: Student, Exam and Result. The student class has data members such as roll no, name etc. Create a class Exam by inheriting the Student class. The Exam class adds data members representing the marks scored in six subjects. Derive the class Result from class Exam and it has its own members total marks and average. Calculate the total marks and average.
8. Write a Java program to calculate area of different geometrical figures (circle, rectangle, square, triangle) using function overloading.
9. Write a Java program to create a class Employee. Derive 3 classes from this class namely, Programmer, Analyst & Project Leader. Take attributes and operations on your own.
10. Write a Java program to implement multiple Inheritance using Interface.
11. Write a Java program to create Student class in package1 and Marks class in package2 which inherit Student class. Calculate the total and average of marks in Result class.
12. Write a Java program to handle the pre-defined exceptions, ArithmeticException and

ArrayIndexOutOfBoundsException.

13. Write a Java program to create and handle your own Exception.
14. Write a Java program to create a Thread by extending Thread class.
15. Write a Java program to create a Thread by implementing Runnable interface.
16. Write a Java program to read a number from keyboard using BufferedReader class & to find out whether the number is prime or not.

Course Outcomes:

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

CO1: Demonstrate the basics of procedural oriented and object oriented programming
CO2: Demonstrate the basic concepts in Java.
CO3: Examine the various derived types
CO4: Evaluate the designs created using Applet and Maya
CO5: Make use of packages and interfaces in Java

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	9	1	1	1	9
CO2	9	9	3	3	3
CO3	1	1	9	1	3
CO4	1	1	1	9	9
CO5	3	1	1	1	1
Weightage	23	13	15	15	25
Weightage Percentage of Course Contribution of PO's	4.47	3.65	4.25	3.80	5.12

Level of Correlation 1-**Low** 3-**Medium** 9-**High**

Course Code	21UCS5	DATABASE SYSTEM CONCEPTS	TOTAL HOURS	CREDITS
			5	5
Core/~~Elective/Supportive~~		Core Course - V	Syllabus Version	2021-2022

Course Objectives:

- To provide the basic concepts of the database systems
- To provide information about data models, storage structure, normalization and SQL

Unit:1

Introduction: Database-System Applications- Purpose of Database Systems - View of Data - Database Languages - Relational Databases - Database Design -Data Storage and Querying Transaction Management -Data Mining and Analysis - Database Architecture - Database Users and Administrators - History of Database Systems.

Unit:2

Relational Model: Structure of Relational Databases -Database Schema - Keys – Schema Diagrams - Relational Query Languages - Relational Operations. Fundamental Relational- Algebra Operations Additional Relational-Algebra Operations- Extended Relational-Algebra Operations.

Unit:3

SQL: Overview of the SQL Query - Language - SQL Data Definition - Basic Structure of SQL Queries - Additional Basic Operations - Set Operations - Null Values - Aggregate Functions - Nested Subqueries - Modification of the Database - Join Expressions - Views - Transactions - Integrity Constraints - SQL Data Types and Schemas – Authorization.

Unit:4

Relational Languages: The Tuple Relational Calculus - The Domain Relational Calculus. Database Design and the E-R Model: Overview of the Design Process - The Entity- Relationship Model - Reduction to Relational Schemas - Entity-Relationship Design Issues - Extended E-R Features - Alternative Notations for Modeling Data - Other Aspects of Database Design.

Unit:5

Relational Database Design: Features of Good Relational Designs - Atomic Domains and First Normal Form - Decomposition Using Functional Dependencies - Functional-Dependency Theory - Decomposition Using Functional Dependencies - Decomposition Using Multivalued Dependencies-More Normal Forms - Database-Design Process.

Course Outcomes:

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

CO1: Illustrate the concepts of database, structured query language and procedural Language

	CO2: Apply the oracle functions to extract the data CO3: Analyze the various data models in database management system CO4: examine the importance of normalization and reports. CO5: Develop an application using database
Text Book	
1	Abraham Silberschatz, Henry F. Korth, S.Sudarshan**"Database System Concepts"**, Sixth edition,McGraw-Hill-2010. **Unit I:**Chapter 1.1 – 1.9, 1.12, 1.13 **Unit II:**Chapter 2, 2.1-2.6, 6.1 **Unit III:**Chapter 3.1 - 3.9, 4.1 – 4.6 **Unit IV:**Chapter 7.1, 7.2, 7.6 – 7.10 **Unit V:**Chapter 8.1 – 8.8
Reference Book	
1	RamezElmasri, Database Systems: Models, Languages, Design and Application, Pearson Education 2014
Online Web Reference	
1	https://www.tutorialspoint.com/dbms/

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	9	9	9	9	9
CO2	9	1	3	3	9
CO3	9	3	1	1	3
CO4	9	1	1	1	9
CO5	9	3	3	3	9
Weightage	45	17	17	17	39
Weightage Percentage of Course Contribution of PO's	8.75	4.78	4.82	4.30	7.99

Level of Correlation 1-**Low** 3-**Medium** 9-**High**

Course Code	21UCS6P	RDBMS LAB	TOTAL HOURS	CREDITS
			3	3
Core/~~Elective/Supportive~~		Core Course Practical - IV	Syllabus Version	2021-2022

Course Objectives:

- Enable students to write and execute SQL queries.
- Enable students to write and execute PL/SQL programmes.

LIST OF LAB PROGRAMS

To Implement Data Definition Language

1.1. Create, Alter, Drop, Truncate a table.

1.2. To Implement Constraints.

1.2.1. (A) Primary Key, (B) Foreign Key, (C) Check, (D) Unique, (E) Null, (F) Not Null, (G) Default, (H).Enable Constraints, (I) Disable Constraints, (J) Drop Constraints.

2. To Implement DML, TCL And DRL

2.1. (A) Insert, (B) Select, (C) Update, (D) Delete, (E) Commit, (F) Rollback, (G)Save Point, (I) Like'%', (J) Relational Operator.

3. To Implement Nested Queries & Join Queries

3.1. (A) Implementation of Nested Queries.

3.2. (B) (A) Inner Join, (B) Left Join, (C) Right Join (D) Full Join.

4. To Implement Views

4.1. (A) View, (B) Joint View, (C) Force View, (D) View With Check Option.

5. Control Structure

5.1. To Write a PL/SQL Block for Addition of Two Numbers.

5.2. To Write a PL/SQL Block using If Condition.

5.3. To Write a PL/SQL Block using If and Else Condition.

5.4. To Write a PL/SQL Block for finding Greatest of Three Numbers Using If and Elseif.

5.5. To Write a PL/SQL Block for Summation of Odd Numbers Using For Loop.

Course Outcomes:

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

CO1: Demonstrate the structured query language commands, constraints and functions

CO2: Experiment with join operations and set operations

CO3: Examine the procedural language/ structured query language, cursor and exception handling

CO4: Evaluate the procedures, functions, triggers and oracle reports

CO5: Construct an database for an application

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	9	1	1	1	9
CO2	9	9	3	3	3
CO3	1	1	9	1	3
CO4	1	1	1	9	1
CO5	3	3	3	1	1
Weightage	23	15	17	15	17
Weightage Percentage of Course Contribution of PO's	4.47	4.21	4.82	3.80	3.48

Level of Correlation 1-**Low** 3-**Medium** 9-**High**

Course Code	21UELN1	ADVANCED SKILLS FOR COMMUNICAION IN ENGLISH	TOTAL HOURS	CREDITS
			2	2
~~Core~~/Elective/~~Supportive~~		ELECTIVE COURSE- I	Syllabus Version	2021-2022

Course Objectives:

- To understand and develop techniques and skills involved in speaking English.
- To remember and apply the nuance of communicative language and to develop the L.S.R.W skills and integrate them.
- To understand and employ the idiomatic expressions learnt while speaking English.
- To understand and apply grammar involved while speaking effective English.
- To recall and use English for writing dialogues, E-mail and Bio-Data.

Unit:1	

Grammar–Tenses–voices–concord-clauses-types of sentences.

Unit:2	

English for Etiquette-Greeting-Introducing Congratulating-Requesting-Accepting/Declining an Invitation-Expressing gratitude-Apologising-Seeking,Granting,Refusing Permission.

Unit:3	

Group Discussion & Interview Facing Skill.

Unit:4	

Personality Development Soft Skills-international body language setting-positive attitude-emotional interlligence-leadership qualities problem solving-human values.

Unit:5	

Communication for career: preparing a CV-group discussion, interviews,standard,panel,walk-in,group,stress,mock interviews(Practice).

Course Outcomes:

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

CO1: recognize and relate idioms and grammar and employ for Speaking and Writing English. CO2 : apply the vocabulary and grammar learnt while speaking and writing. CO3 : analyse and interpret the meaning from the context given. CO4 : analyse types of sentences. CO5 : develop Employability Skills and help in preparation for Competitive Examinations.

References:

1.	Dr.T.M.Fartharthullah: A HandBook of GRE.
2.	Dr.R.M.Fartharthullah: Communication Skills for Under Graduates.

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	9	6	3	3	6	6	3
CO2	9	9	6	6	9	9	6
CO3	9	6	3	3	6	6	3
CO4	9	6	3	3	6	6	3
CO5	9	9	6	6	9	9	6
Weightage	9	7.2	4.6	4.2	7.2	7.2	4.2
Weightage Percentage of Course Contribution of PO's	1.8	1.44	0.92	0.84	1.44	1.44	0.84

Level of Correlation 3-**Low** 6-**Medium** 9-**High**

Course Code	21UCS7	PROGRAMMING IN VB.NET	TOTAL HOURS	CREDITS
			5	5
Core/~~Elective/Supportive~~		Core Course - VII	Syllabus Version	2021-2022

Course Objectives:

- To understand the concepts of GUI Programming using Visual Basic
- To develop simple applications using Visual Basic

Unit:1

Introduction to Microsoft.Net Framework: Introduction – Start Page – IDE Main Window – Class View Window – Object Browser – Code Window – Compiling the Code – Code Debugging – Developing a Simple VB.NET Console Application – Developing Simple VB.NET Project through Visual Studio IDE.

Unit:2

Variables Constants and Expressions: Value Types and Reference Types – variable Declaration and Initialization – Value Data Types – Reference Data Types – Boxing and Unboxing – Arithmetic Operators and expressions – Text Box Control – Label Control – Button Control – Control Statements – IF Statement – Radio Buttons – Check Box – Group Box – List Box – Checked Listbox – Combo Box Control – Select ... Case – While – Do – For Statements.

Unit:3

Methods and Arrays – Types of Methods – Arrays – One Dimensional – Multidimensional Arrays – Jagged Arrays – Classes Properties and Indexes: Definition and Usage of Class –Constructor Overloading – Copy Constructor – Instance and Shared Class Members – Shared Constructor –Properties – Indexes, Inheritance and Polymorphism.

Unit:4

Definition and Usage of Interfaces – Namespaces – Events – Default Exception Handling Mechanism – User Defined Exception Handling Mechanism – Back Tracking – Throw Statement – Custom Exception – Usage of Thread – Thread Class – Start() , Abort(), Join(), Sleep(), Suspend() and Resume Methods.

Unit:5

Database Connectivity: Advantages of ADO.NET – Managed Data Providers – Developing Simple Application – Creation of a Data Table – Retrieving Data from Tables – Table Updating.

Course Outcomes:

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

CO1: Explain the basic concepts of .NET framework

CO2: Illustrate the importance of interfaces, packages, inheritance, exception handling and regular expressions

	CO3: Analyze the various .NET controls CO4: Evaluate the use of XML in web services CO5: Build small web application
Text Book	
1	**Visual Basic . Net,** C. Muthu, Vijay Nicole Imprints Private Limited **Unit I:**Chapter 2 **Unit II:**Chapter 3, 4 **Unit III:**Chapter 5, 6, 7 **Unit IV:** Chapter 8, 9, 10, 11 **Unit V:**Chapter 12, 15
Reference Book	
1	The Complete Reference – Visual Basic . NET – Jefrey R. Shapiro , Tata McGraw Hill, 2002.
Online Web Reference	
1	● https://www.tutorialspoint.com/vb.net/

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	9	3	9	9	9
CO2	9	1	3	3	9
CO3	3	3	3	1	1
CO4	9	9	1	9	9
CO5	1	3	1	3	3
Weightage	31	19	17	25	31
Weightage Percentage of Course Contribution of PO's	6.03	5.34	4.82	6.33	6.35

Level of Correlation 1-**Low** 3-**Medium** 9-**High**

Course Code	21UCS8P	PROGRAMMING IN VB.NET LAB	TOTAL HOURS	CREDITS
			3	3
Core/~~Elective/Supportive~~		Core Course – Practical - VIII	Syllabus Version	2021-2022

Course Objectives:

- To construct programmes in VB.NET.
- To construct and connect database.

LIST OF LAB PROGRAMS

1. Console Applications.
2. Boxing and Unboxing
3. Control Structure
4. Controls
5. Arrays
6. Constructor
7. Inheritance
8. Polymorphism.
9. Events
10. Exception Handling
11. Thread
12. Database Connectivity

Course Outcomes:

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

CO1: Illustrate the basic concepts of VB.NET

CO2: Make use of console, windows, and web based applications

CO3: Discover various form controls for developing .net applications

CO4: Determine to create user defined classes, interfaces and namespaces for developing real time applications

CO5: Design applications with database control and publish applications

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	1	1	1	9
CO2	3	1	3	3	9
CO3	1	1	1	1	3
CO4	1	1	1	9	1
CO5	3	3	3	1	1
Weightage	9	7	9	15	23
Weightage Percentage of Course Contribution of PO's	1.75	1.97	2.55	3.80	4.71

Level of Correlation 1-**Low** 3-**Medium** 9-**High**

Course Code	21UCS9	OPERATING SYSTEM CONCEPTS	TOTAL HOURS	CREDITS
			6	5
Core/~~Elective/Supportive~~		Core Course - IX	Syllabus Version	2021-2022

Course Objectives:

- To provide fundamental concepts of operating system
- To provide knowledge on various resources managed by operating system and techniques used for managing resources

Unit:1

INTRODUCTION: What is an Operating System? Mainframe Systems Desktop Systems Multiprocessor Systems Distributed Systems Clustered Systems - Real-Time Systems Handheld Systems Feature Migration Computing Environments. **COMPUTER-SYSTEM STRUCTURES:** Computer-System Operation I/O Structure Storage Structure Storage Hierarchy Hardware Protection Network Structure. **OPERATING-SYSTEM STRUCTURES:** System Components Operating-System Services System Calls System Programs System Structure Virtual Machines. **Extra Reading /Key words:** Finding the evolution of computer system.

Unit:2

PROCESSES: Process Concept Process Scheduling Operation on Processes Cooperating Processes Interprocess Communication. **THREADS:** Overview Multithreading Models - Threading Issues. **CPU SCHEDULING:** Basic Concepts Scheduling Criteria Scheduling Algorithms MultipleProcessor Scheduling Real-Time Scheduling Algorithm Evaluation. **Extra Reading /Key words:** Calculating waiting time, turnaround time and response time for all the scheduling Algorithms.

Unit:3

PROCESS SYNCHRONIZATION: Background - The Critical-Section Problem Synchronization Hardware Semaphores Classic Problems of Synchronization. **DEADLOCKS:** System Model Deadlock Characterization Methods for Handling Deadlocks from Deadlock. **Extra Reading /Key words:** Finding the real time examples in deadlock.

Unit:4

MEMORY MANAGEMENT: Background Swapping Contiguous Memory Allocation Paging - Segmentation with Paging. **VIRTUAL MEMORY:** Background - Demand Paging Process Creation - Page Replacement Allocation of Frames Thrashing Other Considerations. **Extra Reading /Key words:** Calculating page fault and comparing which page replacement algorithm is the best one.

Unit:5

FILE-SYSTEM INTERFACE: File Concept Access Methods Directory Structure File System Mounting File Sharing Protection. **FILE-SYSTEM IMPLEMENTATION:** File-System Structure File System Implementation - Directory Implementation Allocation Methods Free-Space Management Efficiency and Performance Recovery.

Course Outcomes:

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

CO1: Explain the concepts, functions and inter-process communications of operating system

CO2: Solve the resource allocation and page replacement methods in operating system

CO3: Analyze how memory, I/O devices, files and processes are managed

CO4: Evaluate the performance of various scheduling algorithms

CO5: Elaborate the features of operating system

Text Book

1	Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, **Operating System Concepts,** 2006, Sixth Edition, John Wiley & Sons Publications Inc., Singapore. **Unit I:**Chapters 1, 2, 3(3.1 3.6) **Unit II:**Chapters 4(4.1 4.5), 5(5.1 - 5.3), 6(6.1 - 6.6) **Unit III:**Chapters 7(7.1 7.5), 8(8.1 8.7) **Unit IV:**Chapters 9(9.1 9.6), 10(10.1 10.6, 10.8) **Unit V:**Chapters 11(11.1 11.6), 12(12.1 12.7)

Reference Books

1	DeitelHarvay M., **Operating Systems**, 2003, Pearson Education Publications, Singapore.
2	GodboleAchyut S., **Operating Systems**, 2002, Tata McGraw Hill Publishing Company Limited, New Delhi.
3	Milan Milankovic, **Operating System-Concepts and Design**, 2005, Tata McGraw Hill Publishing Company Limited, New Delhi
4	Tanenbaum Andrew S. & Woodhull Albert S., **Operating Systems Design and Implementation**, 2002, Pearson Education Publications, Singapore.
5	William Stallings, **Operating Systems Internals and Design Principles**, 2006, Pearson Education Publications, Singapore.
6	W. Mary Magdalene Viola and V. Mahalakshmi, **Operating Systems,** Charulatha Publications.

Online Web Reference

1	https://www.tutorialspoint.com/operating_system/operating_system_tutorial.pdf

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	9	1	1	9	9
CO2	3	9	3	3	9
CO3	9	1	1	1	3
CO4	9	1	9	9	3
CO5	3	3	3	1	1
Weightage	33	15	17	23	25
Weightage Percentage of Course Contribution of PO's	6.42	4.21	4.82	5.82	5.12

Level of Correlation 1-**Low** 3-**Medium** 9-**High**

Course Code	21UCS10P	LINUX LAB	TOTAL HOURS	CREDITS
			4	4
Core/~~Elective/Supportive~~		Core Course Practical - X	Syllabus Version	2021-2022

Course Objectives:

- To Impart Practical Training in LINUX Operating System

LIST OF PROGRAMS

Write Shell Programs for the following in Linux Operating System

1. Check whether the given number is prime or not.
2. Find the biggest of given two numbers
3. To check whether the given number is odd or even
4. To generate Fibonacci Series
5. To prepare electric bill for domestic consumers.

   For first 100 units - Rs.0.75/ unit
   For next 100 units - Rs.1.50/unit
   Above 200 units - Rs.3.00/unit.
   Prepare the bill in the following format:
   Customer No. ----------
   Customer Name ----------
   Pre. Reading ----------
   Cur. Reading----------
   Units Consumed ----------
   Charge ----------
   Signature
6. Write a program to display the result PASS or FAIL using the information given below: Student Name, Student Reg. No. Mark1, Mark2, Mark3, Mark4. The minimum pass for each subject is 50.
7. Write a program to prepare a Payroll with Basic Pay, DA, Allowances, PF, Gross Pay and Net Pay.
8. Using Case Statement, write a program to check the files ending with vowels.
9. Write a program to sort the names in alphabetical order, numbers in ascending and descending order.
10. Write a menu driven program to print Bio-data for five persons

Course Outcomes:

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

CO1: explain the basic operations in LINUX
CO2: utilize the files and directories for manipulation
CO3: plan how to use granting and revoking permission in LINUX.
CO4: determine the performance of LINUX using various commands.
CO5: develop scripts to use effectively in LINUX system

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	9	3	1	9	9
CO2	3	9	3	3	9
CO3	1	3	1	9	1
CO4	9	1	9	9	3
CO5	3	3	9	1	9
Weightage	25	19	23	31	31
Weightage Percentage of Course Contribution of PO's	4.86	5.34	6.52	7.85	6.35

Level of Correlation 1-**Low** 3-**Medium** 9-**High**

Course Code	21UCS11	INTERNET OF THINGS	TOTAL HOURS	CREDITS
			6	5
Core/~~Elective/Supportive~~		Core Course - XI	Syllabus Version	2021-2022

Course Objectives:

- To understand the communication technologies in IoT
- To know the IoT protocols and web of things
- To provide knowledge on the various applications of IoT

Unit:1

Introduction: IOT Definitions and Functional Requirements – Web 3.0 View of IoT- Ubiquitous IoT Applications: A Panoramic View of IoT Applications - Important Vertical IoT Applications – Four Pillars of IoT: The Horizontal, Verticals, and Four Pillars.

Unit:2

M2M: The Internet of Devices - RFID: The Internet of Objects- WSN: The Internet of Transducers- SCADA: The Internet of Controllers.

DNA of IoT:- DCM: Device, Connect, and Manage- Device: Things That Talk -Connect: Via Pervasive Networks- Manage: To Create New Business Value.

Unit:3

Middleware for IoT: An Overview of Middleware - Communication Middleware for IoT - IoT protocols: Protocol Standardization for IoT - IoT Protocol Standardization Efforts: M2M and WSN Protocols- SCADA and RFID Protocols – Issues with IoT Standardization – Unified Data Standards: A Challenging Task.

Unit:4

Web of Things: Web of Things versus Internet of Things: Two Pillars of the Web – Architecture Standardization for WoT: Platform Middleware for WoT – Unified Multitier WoT Architecture – WoT Portals and Business Intelligence-Challenges of IoT Information Security.

Unit:5

Cloud of Things: Cloud Computing – Grid/SOA and Cloud Computing - Cloud Middleware - NIST's SPI Architecture and Cloud Standards- Cloud Providers and Systems - The Cloud of Things: The Internet of Things and Cloud Computing- Mobile Cloud Computing - Cloud of Things Architecture.

Course Outcomes:

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

CO1: To understand the fundamentals of Internet of Things. CO2: To know the basics of communication protocols and the designing principles of Web connectivity CO3: To gain the knowledge of Internet connectivity principles CO4: Designing and develop smart city in IoT. CO5: Analyzing and evaluate the data received through sensors in IOT	
Text Book	
1	**The Internet of Things in the Cloud: A Middleware Perspective** - Honbo Zhou–CRC Press 20 **Unit I:**Chapter 1.3, 1.4, Chapter 2.1, 2.2, **Unit II:**Chapter 3, Chapter 4, Chapter 5 **Unit III:**Chapters 17, 18 & 19 , **Unit IV:**Chapter 6, Chapter 7 **Unit V:**Chapter 8, Chapter 9
Reference Books	
1	Networks, Crowds, and Markets: Reasoning About a Highly Connected World - David Easley and Jon Kleinberg, Cambridge University Press - 2010.
2	The Internet of Things: Applications to the Smart Grid and Building Automation by - Olivier Hersent, Omar Elloumi and David Boswarthick - Wiley -2012
3	Olivier Hersent, David Boswarthick, Omar Elloumi , "The Internet of Things – Key Applications and Protocols
Online Web Reference	
1	Introduction to IOT, https://nptel.ac.in/courses/106/105/106105166/

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	9	3	1	9	9
CO2	9	9	9	3	9
CO3	9	3	1	9	9
CO4	9	1	9	9	3
CO5	9	3	9	1	9
Weightage	45	19	29	31	39
Weightage Percentage of Course Contribution of PO's	8.75	5.34	8.22	7.85	7.99

Level of Correlation 1-**Low** 3-**Medium** 9-**High**

Course Code	21UCSE1A	DATA COMMUNICATION AND NETWORKS	TOTAL HOURS	CREDITS
			6	5
~~Core~~/Elective/~~Supportive~~		Elective Course - I	Syllabus Version	2021-2022

Course Objectives:

- To learn how computer network hardware and software operate
- To investigate the fundamental issues driving network design
- To learn about dominant network technologies

Unit:1

Data Communication – Networks – Protocols And Standard – Line Configuration – Topology – Transmission Mode – Categories Of Networks – Internet Works

Unit:2

The OSI Model – Functions Of The Layers – TCP/IP Protocols Suite – Signals – Analog And Digital Signal – Data Transmission – Data Terminal Equipment – Data Circuit Terminals Equipment – Modems

Unit:3

Transmission Of Media – Guided Media – Unguided Media – Transmission Impairments – Media Comparison - Error Detection – Types of Errors – Detection – Vertical Redundancy Check (VRC) – Longitudinal Redundancy Check (LRC) – Cyclic Redundancy Check (CRC) - Check Sum

Unit:4

Switching – Circuit Switching – Packet Switching – Message Switching - Networking And Internetworking Devices – Repeaters – Bridges – Routers – Gateways. Routing Algorithm – Distance Vector Routing – Link State Routing.

Unit:5

Internet Working: TCP/IP Protocol Suite – Client Server Model – Domain Name System – File Transfer Protocol (FTP) – Simple Mail Transfer Protocol (SMTP) – World Wide Web (WWW) – Hyper Text Transfer Protocol (HTTP).

Course Outcomes:

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

CO1: Understand the basics of communications and networking

CO2: Understand and remember the analog and digital transmission methods, mode of transmissions, parallel and serial communications, etc.

CO3: Understand and analyse the transmission media, network topology and

switching techniques. CO4: Remember, understand the network protocols and the functions of OSI model CO5: Understand the ISDN architecture, interfaces, protocols, ATM cells and layers.	
Text Books	
1	**"Data Communications and Networking"** –2nd Edition- Behrouz A Forouzan. **Unit I:** Chapter 1, 2(2.1 To 2.4) **Unit II:**Chapter 3(3.1to3.3), 4(4.1 To 4.6) **Unit III:**Chapter 7(7.1 To 7.3), 9(9.1 To 9.6) **Unit IV:**Chapter 14(14.1 To 14.3), 21(21.1 To 21.8) **Unit V:**Chapter 25(25.1, 25.3, 25.5, 25.7, 25.9, 25.10)
Reference Books	
1	Computer Networks- Tanenbaum
2	Computer Networks –William Stallings
Online Web Reference	
1	• https://www.tutorialspoint.com/data_communication_computer_network/index.htm

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	9	3	1	9	9
CO2	9	9	9	1	3
CO3	3	3	3	9	9
CO4	9	3	9	9	1
CO5	9	3	9	1	9
Weightage	39	21	31	29	31
Weightage Percentage of Course Contribution of PO's	7.59	5.90	8.78	7.34	6.35

Level of Correlation 1-**Low** 3-**Medium** 9-**High**

Course Code	21UCSE1B	WORKING PRINCIPLES OF INTERNET	TOTAL HOURS	CREDITS
			6	5
~~Core~~/Elective/~~Supportive~~		Elective Course - I	Syllabus Version	2021-2022

Course Objectives:

- To understand the working principles of Internet
- To impart knowledge on safeguarding Internet

Unit:1	

What is Internet? The Internet's underlying Architecture

Unit:2	

Connecting to the Internet – Communicating on the Internet

Unit:3	

How the World Wide Web works. Common Internet tools

Unit:4	

Multimedia on the Internet – Intranet and shopping on the Internet

Unit:5	

Safeguarding the Internet

Course Outcomes:

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

CO1: To understand the fundamentals of Internet.
CO2: To know the basics of communication protocols and the designing principles of Web connectivity
CO3: To gain the knowledge of Internet connectivity principles
CO4: Designing and develop smart city in Internet.
CO5: Analyzing and evaluate the data received through sensors in Internet.

Text Book

1	**How the Internet Works**, Preston Gralla, Pearson Education, Eighth Edition, 2006.

Reference Book	
1	Internet for Everyone, Alexis Leon, S. Chand (G/L) & Company Ltd; Second Edition 2012.
Online Web Reference	
1	http://www.stet.edu.in/SSR_Report/Study%20Material/PDF/PHYSICS/UG/II%20Year/3.pdf

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	9	1	1	1	1
CO2	9	1	1	1	1
CO3	9	3	9	9	1
CO4	1	9	9	9	1
CO5	1	9	3	1	1
Weightage	29	23	23	21	5
Weightage Percentage of Course Contribution of PO's	5.64	6.46	6.52	5.32	1.02

Level of Correlation 1-**Low** 3-**Medium** 9-**High**

Course Code	21UCSE1C	DIGITAL COMPUTER FUNDAMENTALS & ARCHITECTURE	TOTAL HOURS	CREDITS
			6	5
~~Core~~/Elective/~~Supportive~~		Elective Course - II	Syllabus Version	2021-2022

Course Objectives:

- To know the concepts of representation and conversion of number systems.
- To understand and gain knowledge about the logic circuits and design different kinds of circuits for Boolean algebra and K-maps.
- To recognize and design combinational and sequential circuits.
- To acquire the knowledge about the internal work flow of CPU, micro-operations and programme control.
- To learn about I/O, data-transfer techniques, and interrupts.

Unit:1

NUMBER SYSTEM: Decimal, Binary, Octal, Hexadecimal – Binary addition, Multiplication, Division – Floating point representation, Complements, BCD, Excess3, Gray codes – Convention between Number Systems. (Self-study: Gray codes)

Unit:2

DIGITAL LOGIC: The Basic Gates – NOR, NAND, XOR Gates – COMBINATIONAL LOGIC CIRCUITS: Boolean Algebra, simplification of Boolean functions – Karnaugh map – Canonical form – Don't care condition –Product of sum, Sum of products, K- map Computational circuits.

Unit:3

ARITHMETIC CIRCUITS: Half Adder, Full Adder, Parallel Binary Adder, BCD Adder, Half subtractor, Full subtractor, Parallel binary subtractor.SEQUENTIAL CIRCUITS - FLIP-FLOP: RS, JK, D, and T– Multiplexers – Demultiplexers – Decoder – Encoder. (Self-Study: Half Subtractor, D and T Flip-flop)

Unit:4

CENTRAL PROCESSING UNIT: General Register Organization – Control word– Examples of Micro operations – Stack organization – Instruction formats – Addressing modes – Data Transfer and manipulation program control.

Unit:5

INPUT – OUTPUT ORGANIZATION: Input-Output Interface – I/O Bus and Interface – I/O Bus Versus Memory Bus – Isolate Versus Memory – Mapped I/O – Example of I/O Interface. ASYNCHRONOUS DATA TRANSFER: Strobe Control and Handshaking – PRIORITY INTERRUPT: Daisy – Chaining Priority, Parallel priority Interrupt, DIRECT MEMORY ACCESS: DMA Controller, DMA Transfer. INPUT-OUTPUT PROCESSOR: CPU – IOP Communication. (Self-Study: Handshaking)

Course Outcomes:

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

CO 1 : Understand the fundamentals of various number systems, complements, codes and perform conversions.
CO2 : Understand the logic gates and the laws of Boolean algebra, remember and solve K-maps.
CO3 : Understand the basics of arithmetic and sequential circuits, apply the logics for designing circuit diagrams.
CO4 : Know and realize the important of central processing unit, instruction formats and various instructions.
CO5 : Understand the usage of I/O, data-transfer, I/O processor and analyze various strategies of interrupts

Text Book

1	M.Morris Mano, "Computer System Architecture", Third Edition –Tenth Impression, Prentice Hall of India, 2013. (UNIT - I to V).

Reference Book

1	V. Vijayendran, "Digital Fundamentals", S. Viswanathan Publishers Pvt Ltd, 2009.
2	Donald P Leach, Albert Paul Malvino, Goutam Saha, "Digital Priniciples and Applications", 7th Edition, McGraw Hill, 2011.
3	David A. Patterson, John L.Hennessy, "Computer Organization and Design", Fourth Edition, Morgan Kauffmann Publishers, 2011.
4	William Stallings, "Computer Organization and Architecture", Tenth Edition, Pearson Education, 2015.

Online Web Reference

1	https://www.studytonight.com/computer-architecture/architecture-of-computer-system 2. onlinecourses.nptel.ac.in/noc19_cs03 3.
2	http://www.cs.uwm.edu/classes/cs458/Lecture/HTML/ch01.html 4.
3	https://www.geeksforgeeks.org/computer-organization-and-architecture-tutorials/#idf

Mapping with Programme Specific Outcomes

Mapping with Programme Specific Outcomes PSO CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	1	1	1	1
CO2	1	1	9	1	1
CO3	1	9	1	1	9
CO4	1	9	9	3	1
CO5	1	1	1	9	1
Weightage	5	21	21	15	13
Weightage Percentage of Course Contribution of PO's	1	4.2	4.2	3	2.6

1 – Low; 3 - Medium; 9 - Strong

Non-Major Elective –Courses offered to the other Department

NME-II -INVESTMENT BASICS

SUB. CODE: 21UCON2

Course Objectives:

The Learner will be able to

CO No.	Course Objectives
CO-1	Understand the deposits services offered by banks
CO-2	Understand Mutual funds and investing in New fund offers
CO-3	Understand midcap and large cap funds
CO-4	Understand investment in gold ETFs
CO-5	Understand investment in liquid funds

Unit-I

Introduction to Investments: Savings Vs Investment – Importance of savings and investment – Factors determining interest rates, Simple interest and Compound interest – Assets available for investment – Financial Vs Non-financial assets – Important attributes of various asset classes - Safety, Risk, Liquidity and Yield.

Unit -II

Bank& Post office deposits and certificates: Introduction to Bank Deposits, Types of Deposit Accounts, Strategies of mobilizing deposits, Common guidelines of opening and operating accounts, deposit related services, Deposit services offered to Non-Resident Indians, Deposit Insurance – Post office Investment Savings schemes – Advantages

Unit -III

Mutual Funds, Life Insurance and Provident Fund: Concept and structure of mutual funds in India; AMC; Types of funds. Life Insurance and Provident fund schemes**:** Type of life insurance policy. Provident Funds: Kinds of provident funds - Equity Linked Savings Schemes (ELSSs) - Pension Plan

Unit -IV

Real assets: Real estate – Bullion market- Introduction of exchange traded funds, Market making by authorized Participants; Creation Units; Portfolio deposits and cash Component. Investments in commodities, real estate, agricultural land, machinery and oil.

Unit -V:

Corporate Securities: Salient features of debt fund; Concept of interest rate and credit risk; Pricing of debt instrument. Liquid Funds Salient features of liquid fund; Floating rate scheme and portfolio churning in liquid funds.

Text Book

1. Natarajan L, (2016), Investment Management, Security Analysis and Portfolio management, Margham Publications, Chennai.
2. Avadhani VA, (2014), Investment and Securities Market in India, Himalaya Publishing House, Mumbai.

References

1. PunithavathiPandian, (2013), Security Analysis and Portfolio Management, Vikas Publishing House Pvt ltd, New Delhi.
2. Bhalla VK, (2014), Investment Management, Security Analysis and Portfolio Management, S.Chand and Company Ltd, New Delhi.

Course Outcomes:

The learner is able to

CO No.	Course Outcomes
CO-1	Compare investments in various bank deposits
CO-2	Outline Mutual funds and New fund offers
CO-3	Relate midcap and large cap funds
CO-4	Plan portfolio with gold ETFs and other investment avenues
CO-5	Infer investments in liquid funds

Course Code	21UCS12	WEB PROGRAMMING USING PHP AND MYSQL	TOTAL HOURS	CREDITS
			6	5
Core/~~Elective/Supportive~~		Core Course - XII	Syllabus Version	2021-2022

Course Objectives:

- To impart knowledge on programming in PHP
- To learn the method of using MySQL constructs

Unit:1

PHP Variables, Operators and Control Structures: PHP Introduction -Basic PHP Syntax -Variables-Constants-PHP Operators-Flow of Controls-PHP Looping-PHP Arrays.

Unit:2

HTML - The Basics: Introduction- Understanding HTML-Hyperlinks and Bookmarks-Images and Backgrounds-Tables-HTML Frames-Lists in HTML-HTML Form and Input Tag.

Unit:3

Introduction to PHP Functions and Object Oriented Programming: PHP Functions-PHP and Object Oriented Programming- PHP Access Specifiers.

Unit:4

PHP Files: Files Introduction-Testing Files-Accessing File-PHP Functions for Directories.

Unit:5

Need for Databases: MySQL-MySQL Database-MySQL Insert-MySQL Query-MySQL Fetch Array-MySQL Select-MySQL Order By-MySQL Joins-MySQL Update-MySQL Delete-MySQL GROUP BY-Aggregate Functions-MySQL Date – Formats.

Course Outcomes:

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

	CO1: Summarize web programming concepts CO2: Make use of PHP elements CO3: Examine the working environment with WAMP, LAMP and XAMPP CO4: Interpret the concepts of MySQL and PEAR package CO5: Create and manipulate images, files and text editors
Text Book	
1	**Web Programming using PHP and MySQL,** K. MEENA. KARTHICK ANAND BABU, Himalaya Publishing House, 2012. **Unit I:** CHAPTER 1 **Unit II:** CHAPTER 2 **Unit III:** CHAPTER 3 **Unit IV:**CHAPTER 5 **Unit V:**CHAPTER 6
Reference Books	
1	The PHP Complete Reference, Steven Holzner, McGrawHillEducation, 2007.
2	PHP: A Beginner's Guide, Vikram Vaswani, McGraw Hill Education, 2008
Online Web Reference	
1	PHP and MySQL (https://swayam.gov.in/nd2_aic20_sp32/)
2	https://spoken-tutorial.org

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	9	1	1	1	1
CO2	3	1	1	1	1
CO3	1	1	3	3	1
CO4	1	9	1	9	1
CO5	1	9	9	9	9
Weightage	15	21	15	23	13
Weightage Percentage of Course Contribution of PO's	2.92	5.90	4.25	5.82	2.66

Level of Correlation 1-**Low** 3-**Medium** 9-**High**

Course Code	21UCS13P	PHP AND MYSQL LAB	TOTAL HOURS	CREDITS
			4	4
Core/~~Elective/Supportive~~		Core Course Practical - XIII	Syllabus Version	2021-2022

Course Objectives:

- To construct programmes in PHP
- To use MySQL to create database

LIST OF PROGRAMS

1. Write a program to find the factorial of a number.
2. Write a program using Conditional Statements.
3. Write a program to find the maximum value in a given multi-dimensional array.
4. Write a program to find the GCD of two numbers using user-defined functions.
5. Design a simple web page to generate multiplication table for a given number.
6. Design a web page that should compute one's age on a given date.
7. Write a program to download a file from the server.
8. Write a program to draw the human face.
9. Write a program to design a simple calculator.
10. Design an authentication web page in PHP with MySQL to check username and password.

Course Outcomes:

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

CO1: Demonstrate the basic concepts using PHP elements
CO2: Apply the various existing libraries for developing application
CO3: Inspect the HTML elements for validation
CO4: Interpret OOPS concepts with PHP
CO5: Build web applications

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	9	1	1	1	1
CO2	3	9	9	9	1
CO3	1	1	1	1	1
CO4	1	1	1	1	1
CO5	1	9	9	9	9
Weightage	15	21	21	21	13
Weightage Percentage of Course Contribution of PO's	2.92	5.90	5.95	5.32	2.66

Level of Correlation 1-**Low** 3-**Medium** 9-**High**

Course Code	21UCS14	MICROPROCESSOR AND ITS APPLICATIONS	TOTAL HOURS	CREDITS
			6	5
Core/~~Elective/Supportive~~		Core Course - XIV	Syllabus Version	2021-2022

Course Objectives:

- To understand the basic principles of microprocessor architecture & its pin configuration.
- To write simple assembly language programs and know the concepts of memory & I/O interfacing.

Unit:1

Evolution of microprocessors – single chip microcomputers – Microprocessor applications – Programming Digital computers – Memory – Buses – Memory addressing capacity and CPU – microcomputers – Processor architecture – Intel 8085 – Instruction cycle – Timing diagram

Unit:2

Instruction set of Intel 8085 – Instruction and data formats – Addressing modes – status flags – Intel 8085 instructions – Programming of microprocessors – Assembly language – Assemblers – stacks and subroutines – Macro.

Unit:3

Assembly language programming – Simple examples – Addition and subtraction of binary and decimal numbers – complement – shift – masking – Finding the largest and smallest numbers in a array – Arraigning a series of numbers – Sum of series of numbers – Multiplication – Division.

Unit:4

Peripheral devices and interfacing – Address space partitioning – memory and I/O interfacing – Data transfer schemes – Interrupts of Intel 8085 – Interfacing memory and I/O devices – I/O ports – Programmable peripheral interface – Programmable counter / interval time .

Unit:5

Microprocessor applications – Delay subroutines – Interfacing of 7 segment displays – Frequency measurement – Temperature measurement and control – Water level indicator – Microprocessor based traffic control.

Course Outcomes:

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

CO1: Explain the process model for a software project development

CO2: Identify the phases of project management life cycle

CO3: Analyze cost estimate and problem complexity using various estimation techniques

CO4: Evaluate test cases

CO5: Design UML diagrams	
Text Book	
1	**Fundamental of Microprocessors and Microcomputers** – Badri Ram – fourth revised edition – Dhanpat Rai and sons – 1993. **Unit I:**Chapter 1,3 **Unit II:**Chapter 4,5 **Unit III:**Chapter 6 **Unit IV:**Chapter 7 **Unit V:**Chapter 9
Reference Book	
1	Microprocessor Architecture, Programming and applications with the 8085/8080A – Ramesh S. Gaonkar – Wiley Eastern – 1990.
Online Web Reference	
1	• https://www.tutorialspoint.com/microprocessor/index.htm • http://nptel.ac.in/courses/108107029/

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	1	1	1	1
CO2	9	9	3	9	9
CO3	1	9	9	1	1
CO4	1	1	1	1	1
CO5	1	3	1	1	1
Weightage	13	23	15	13	13
Weightage Percentage of Course Contribution of PO's	2.53	6.46	4.25	3.29	2.66

Level of Correlation 1-**Low** 3-**Medium** 9-**High**

Course Code	21UCSE2A	DATA STRUCTURES	TOTAL HOURS	CREDITS
			6	5
~~Core~~/Elective/~~Supportive~~		Elective Course - II	Syllabus Version	2021-2022

Course Objectives:

- To understand the basic concepts of Data structures
- To understand the various data structures

Unit:1

Basic Terminology – Data Structure Operations – Algorithms: Complexity, Time Space Tradeoff – Arrays: Linear Array – Representation of Linear Array – Inserting and Deleting – Bubble Sort – Linear Search- Binary Search.

Unit:2

Linked List: Representation – Traversing – searching – Insertion – Deletion- Two Way List

Unit:3

Stack: Array Representation – Linked Representation – Arithmetic Expression – Quick Sort – Queue - Linked Representation.

Unit:4

Trees: Binary Tree Representation – Traversing – Traversal Algorithms Using Stack – Threads - Binary Search Trees - Insertion – Deletion in Binary Search Trees – Heap Sort.

Unit:5

Graph: Terminology – Sequential Representation of Graph – Linked Representation of Graph- Operations on Graphs – Sorting: Insertion Sort – Selection Sort – Merge Sort.

Course Outcomes:

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

CO1: To give a fundamental knowledge on data structures and exposure to development of algorithms related to data structures.

CO2: Implement operations like searching, insertion and deletion traversing mechanism etc. on various data structures such as linked list.

CO3: Implement operations like insertion and deletion traversing mechanism on stack and queue.

CO4: Implement non-linear data structures are tree and graphs for a specified applications.

CO5: Implement appropriate sorting searching technique for a given problem analyze the complexity of given algorithms	
Text Book	
1	**Data Structures** – Lipschuta, Tata McgrawHill, Schaum's Outline Series. **Unit I:**Chapter 1.2, 1.4, 1.5, 4.2 – 4.8 **Unit II:**Chapter 5.2 – 5.5, 5.7,5.8, 5.10 **Unit III:**Chapter 6.2 – 6.6, 6.10, 6.11 **Unit IV:**Chapter 7.2 – 7.5, 7.7 – 7.9, 7.17 **Unit V:**Chapter 8.2 – 8.3,8.5,8.6,9.3-9.5
Reference Book	
1	Fundamentals Of Data Structure – Ellis Horowitz And SartajSahini.
Online Web Reference	
1	● https://www.studytonight.com/data-structures.

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	9	9	9	1	1
CO2	1	3	1	3	3
CO3	1	1	1	1	1
CO4	1	1	1	9	9
CO5	1	1	3	1	1
Weightage	13	15	16	15	15
Weightage Percentage of Course Contribution of PO's	2.53	4.21	4.53	3.80	3.07

Level of Correlation 1-**Low** 3-**Medium** 9-**High**

Course Code	21UCSE2B	SOFTWARE ENGINEERING	TOTAL HOURS	CREDITS
			6	5
~~Core~~/Elective/~~Supportive~~		Elective Course - II	Syllabus Version	2021-2022

Course Objectives:

- To provide fundamental concepts of software engineering
- To understand the steps in Software development process

Unit:1

Introduction to Software Engineering: Some Definitions – Some Size factors – Quality and Productivity Factors – Managerial Issues. **Planning a Software Project:** Introduction -Defining the Problem – Developing a Solution Strategy – Planning the Development Process – The Phased Life-Cycle Model- The Prototype Life-Cycle Model -Planning an Organizational Structure – Project Structure – Programming Team Structure.

Unit:2

Software Cost Estimation: Introduction-Software Cost Factors – Software Cost Estimation Techniques – Expert Judgement – Delphi Cost Estimation – Work Breakdown Structures – Algorithmic Cost Models - Staffing-Level Estimation – Estimating Software Maintenance Costs.

Unit:3

Software Requirements Definitions: Introduction -The Software Requirements Specification – Formal Specification Techniques – Relational Notation – State oriented Notations – Structured Analysis and Design Technique – Structured System Analysis – **Software Design:** Introduction- Fundamental Design Concepts – Modules and Modularisation Criteria – Design Notations – Design Techniques – Test Plans.

Unit:4

Implementation Issues: Introduction – Coding Style – Documentation Guidelines – **Verification and Validation Techniques:** Introduction - Quality Assurance – Walkthroughs and Inspections – Unit Testing – Debugging – System Testing.

Unit:5

Software Maintenance: Introduction – Enhancing Maintainability during Development – Managerial Aspects of Software Maintenance – Configuration Management - Source code Metrics.

Course Outcomes:

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

CO1: Explain the process model for a software project development

CO2: Identify the phases of project management life cycle

CO3: Analyze cost estimate and problem complexity using various estimation techniques CO4: Evaluate test cases CO5: Design UML diagrams	
Text Book	
1	**"Software Engineering"** by A.K.R.S. Anusha, Charulatha Publications. **Unit I:** Chapter 1.1.1 - 1.1.2, 1.2 – 1.6, 2.1, 2.3 – 2.5, 2.11 **Unit II:** Chapter 1.7, 3.1 – 3.4 **Unit III:** Chapter 5.1 -5.2, 4.5.1, 4.5.2, 6.1 – 6.7, 8.4.2 **Unit IV:** Chapter 7.1, 7.3 – 7.4, 8.1 – 8.11 **Unit V:** Chapter 10.1 – 10.4, 8.12
Reference Book	
1	"Software Engineering: A practitioners approach" by Roger, S. Pressman McGraw Hill International Book Company.
Online Web Reference	
1	https://www.tutorialspoint.com/software_engineering/index.htm

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	9	9	9	9
CO2	9	9	1	3	9
CO3	1	1	1	9	1
CO4	1	1	1	1	1
CO5	1	1	1	1	1
Weightage	13	21	13	23	21
Weightage Percentage of Course Contribution of PO's	2.53	5.90	3.68	5.82	4.30

Level of Correlation 1-**Low** 3-**Medium** 9-**High**

Course Code	21UCSE2C	SOFTWARE PROJECT MANAGEMENT	TOTAL HOURS	CREDITS
			6	5
~~Core~~/Elective/~~Supportive~~		Elective Course - II	Syllabus Version	2021-2022

Course Objectives:

- To Understand the Concepts of Project Management
- To Understand the Planning aspects of a Software Project

Unit:1

Introduction to software management: Introduction- why is SPM important? –Project- Software project Vs other type of project – Contract and technical project management – Activities- plan, methods And methodologies – categorizing software projects – stakeholders – Setting objectives – project success and failures –Managements.

Unit:2

Project Evaluation and Programme Management: Introduction-Business case- Project portfolio management- Evaluation of individual Projects-Cost benefit Evaluation Techniques - Risk Evaluation - Programme Management – managing the allocation of resources – Strategic programme management – Creating a programme and aids –Benefits management.

Unit:3

Overview of Project Planning: Introduction- Stepwise Project Planning- steps. Selection of An Appropriate Project Approach: Introduction-Build or buy- Choosing methodologies and technologies-- software Processes and models-choice of Process models- Structure Vs speed of delivery – Waterfall model - spiral model – software prototyping - Rapid application development – Agile methods- Extreme programming.

Unit:4

Software Effort Estimation: Introduction-Where are estimates done? – Problems with over and under estimates – Basis for estimating and its Techniques – Bottom up estimating-Top down approach and parametric models- Expert judgment-Estimating by analogy Function point analysis-FP markII-COSMIC full FP-COCOMO II-cost estimation and staffing patterns.

Unit:5

Activity Planning: Introduction-objectives-when to plan?-project schedules-Projects activities-network Planning models-sequencing and scheduling activities-Formulating a network model-Risk management: Introduction-Risk-Categories of Risk-a framework for dealing with risk-Risk identification-Risk assessment

Course Outcomes:

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

CO-1: Would have learnt about Software Project Planning
CO-2: Would have learnt about Software Activity Planning.
CO-3: Define the SDLC and basics of testing.
CO-4: Outline the types of testing in sample project.
CO-5: Compare and review the quality of the project with SQL plan.

Text Book

1	"Software Project Management" – Bob Hughes, Mike Cotterell and Rajib Mall- Fifth Edition UNIT I: Chapter 1 UNIT II: Chapter , 2 UNIT V: Chapter 5,6 UNIT III: Chapter 3 UNIT IV: Chapter 4

Reference Book

1	Software Project Management –Walker Royce-Pearson Education

Online Web Reference

1	• http://brodzinski.com/2010/06/learning-project-management-basics.html

Mapping Course Outcomes with Programme Outcomes:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	3	1	9	9
CO2	3	1	1	3	9
CO3	3	9	1	9	3
CO4	9	9	3	1	3
CO5	3	1	9	1	9
Weightage	19	23	15	23	33
Weightage Percentage of Course Contribution of PO's	3.74	4.62	3.73	5.23	7.33

1 – Low; 3 - Medium; 9 - Strong

Course Code	21UCSE3A	DATA MINING	TOTAL HOURS	CREDITS
			6	4
~~Core~~/Elective/~~Supportive~~		Elective Course - III	Syllabus Version	2021-2022

Course Objectives:

- To understand the basic concept of data mining process
- To understand the association rule mining, classification, cluster analysis and web data mining

Unit:1

Introduction: Data mining applications – Data mining techniques – The future of data mining – Data mining software.

Unit:2

Association rules mining: Introduction– Basics– Task and a naïve algorithm–Apriori algorithm – Mining frequent pattern without candidate generation (FP–growth) – Performance evaluation of algorithms.

Unit:3

Classification: Introduction – Decision tree – Over fitting and pruning – Decision Tree rules – – Naïve Bayes method – Estimation predictive accuracy of classification methods.

Unit:4

Cluster analysis: Cluster analysis – Types of data – Computing distances–Types of cluster analysis methods –Partitioned methods–Dealing with large databases – Quality and Validity of cluster analysis methods –Cluster analysis software.

Unit:5

OnLine Analytical Processing(OLAP): Introduction – OLAP – Characteristics of OLAP Systems – Motivations for Using OLAP – Multidimensional View and Data Cube – Data Cube Implementations – Data Cube Operations– Guidelines for OLAP Implementation – OLAP Software.

Course Outcomes:

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

CO1: Explain the architecture of data warehouse
CO2: Demonstrate data mining techniques
CO3: Compare classification and clustering
CO4: Assess the importance of web mining
CO5: Apply various data mining algorithms to real time applications

Text Book	
1	"**Introduction to Data mining with case studies**", G.K. Gupta, PHI Private limited, New Delhi, 2008. **Unit I:**Chapter 1 **Unit II:**Chapter 2 **Unit III:**Chapter 3 **Unit IV:**Chapter 4 **Unit V:**Chapter 8
Reference Book	
1	**"Data warehousing and Data Minin**g" -B.S. Charulatha, S. Poonkuzhali, C.Saravanakumar, Charulatha Publications.
Online Web Reference	
1	• https://www.tutorialspoint.com/data_mining/index.htm

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	9	1	1	1	1
CO2	9	1	1	1	1
CO3	1	9	3	1	1
CO4	1	3	1	1	1
CO5	1	1	9	3	9
Weightage	21	15	15	6	13
Weightage Percentage of Course Contribution of PO's	4.09	4.21	4.25	1.52	2.66

Level of Correlation 1-**Low** 3-**Medium** 9-**High**

Course Code	21UCSE3B	SYSTEM ANALYSIS AND DESIGN	TOTAL HOURS	CREDITS
			6	4
~~Core~~/Elective/~~Supportive~~		Elective Course - III	Syllabus Version	2021-2022

Course Objectives:

- To impart the concepts of system analysis.
- To impart the concepts of MIS.

Unit:1

Overview: **Introduction - The System Development Life Cycle (SDLC) - System Development - Methodologies - Project Team Roles and Skills - Planning Phase: Identifying business value - Feasibility Analysis - Creating the work plan, staffing the project, Controlling and directing the project.**

Unit:2

Analysis Phase: System Analysis - analysis process, business process automation, business process improvement, business process reengineering, developing the analysis plan. Gathering Information – interviews, joint application design, questionnaires, document analysis, observation, selecting the appropriate technique. Process Modelling – data flow diagrams, use cases. Data Modelling – ER diagram.

Unit:3

Design Phase: System Design – design strategies, developing the design plan, moving from logical to physical model. Architecture Design – computing architectures, infrastructure design, global issues, security, User Interface (UI) – principles of UI design, UI design process, navigation design, input design, output design. Data Storage Design – data storage formats, optimizing data storage. Program Design – structure chart, program specification.

Unit:4

Implementation Phase: Construction - managing programming, system testing, developing documentation. Installation – conversion, change management, post implementation activities & maintenance, concept of PERT and GANTT Charts.

Unit:5

Management Information System: Concept of Management, organization & System approach to management, MIS Planning, Designing and implementation, Role of DSS, Decision making & MIS, DSS and Knowledge Management System.

Course Outcomes:

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

CO1: demonstrate the need of programming language in numerical methods CO2: make use of programming elements to the algebraic problems CO3: analyze the variety of syntax in C CO4: evaluate the techniques of numerical methods CO5: construct the programs for finding the solution of algebraic, transcendental and simultaneous equations	
Text Book	
1	**System Analysis and Design**, Kenneth E Kendall Julie, PHI, 2012
Reference Book	
1	Modern Systems Analysis and Design, Jeffrey A. Hoffer, Pearson India, 2011.
Online Web Reference	
1	• http://www.w3computing.com/systemsanalysis/

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	9	9	1	1	1
CO2	1	1	3	9	1
CO3	1	1	1	1	1
CO4	1	9	1	1	1
CO5	1	1	9	9	9
Weightage	13	21	15	21	13
Weightage Percentage of Course Contribution of PO's	2.53	5.90	4.25	5.32	2.66

Level of Correlation 1-**Low** 3-**Medium** 9-**High**

Course Code	21UCSE3C	INTRODUCTION TO SYSTEM PROGRAMMING	TOTAL HOURS	CREDITS
			6	5
~~Core~~/Elective/~~Supportive~~		Elective Course - III	Syllabus Version	2021-2022

Course Objectives:

- To know about Hardware and Software.
- To understand the concept of Algorithm, flowcharts and Computer language.
- To understand components and performance of system programming.

Unit:1

Basic computer organization -Computer software: What is software – Relationship between H/W & S/W – types of S/W – Logical system Architecture – Acquiring S/W – S/W development steps – Firmware.

Unit:2

Planning the computer program: Purpose of program planning – Algorithm – Flowcharts – What is a flowchart? Computer languages: Machine language – Assembly language – High level language.

Unit:3

Operating system: What is an OS? – Measuring System Performance – Process Management – Some Popular Operating System.

Unit:4

Application S/W Packages: Word Processing Packages – Spreadsheet Package – Graphics Package – Personal Assistant Package.

Unit:5

Business Data programming: What is a data processing? – Data Storage Hierarchy – standard method of Organizing Data file Management System – file utilities*– Main Components of a DBMS.

Course Outcomes:

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

CO1: Understand the working knowledge of hardware and software of computer.

CO2: Learn the use of flowchart and program planning.

CO3: Describe and explain the fundamental of a computer operating system and Process

Management. CO4: Learn the various features of MS-Office and apply it. CO5: Get the knowledge on Business data processing and data Management.	
Text Book	
1	Pradeep K.Sinha, Priti Shinha, "*COMPUTER FUNDAMENTALS*" – BPB Publications – Third Edition – 2003.
Reference Book	
1	William Stallings (2009), *"*Operating Systems – Internals and Design Principles*"*, Sixth Edition, Pearson Education.
2	V.Rajaram (2006), "*Introduction to Information Technology*", Prentics Hall India.
3	Chanchal Mittal, Pragati (2006), "*Information Technology*", 6th Edition.
Online Web Reference	
1	http://www.geekforgeeks.org.
2	http://compsc.hunter.cuny.edu.
3	http://www.tutorialspoint.system programming

Mapping with Programme Specific Outcomes

Mapping with Programme Specific Outcomes PSO CO	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	1	1	9	3	3
CO2	1	1	1	1	1
CO3	1	1	9	3	3
CO4	9	1	9	9	9
CO5	1	9	1	1	9
Weightage	13	13	29	17	25
Weightage Percentage of Course Contribution of PO's	2.6	5.8	3.4	5	5

SUB.CODE : 21UCSV1/21UCAV1

VALUE ADDED COURSE

TRENDS IN SOCIAL NETWORKS

Course Objectives:

The Learner will be able to

CO No.	Course Objectives
CO-1	Understand the social networking services and uses.
CO-2	Enable the different Social Networking Sites.
CO-3	Acquire knowledge about various Social Networking Apps.

Unit-I

Social Networking Service –Meaning and Definition – History – Social Impact - Features – Emerging Trends – Professional, Curriculum and Learning - Uses - Niche Networks – Trading Network – Business Model – Social - Interaction – Issues - Psychological effects of Social Networking.

Unit -II

Social Networking Sites (SNS) -Meaning – Basic concepts – Risk and Benefits- Types – Facebook –YouTube – Instagram - Twitter – Reddit – Vine (shut down soon) – Ask.fm -Tumblr -Flickr- Google+ - LinkedIn – Pinterest –VK- ClassMates -Meetup

Unit -III

Social Networking Apps- Meaning – Functions – Features – Benefits – Types – Messenger – WhatsApp; Calls – Chats -Contacts – Group – Broadcasting – Status – Gallery – Document – Location – Settings – QQ Chat – WeChat – QZone – Instagram – Viber – LINE - Snapchat - YY

References

1. https://en.wikipedia.org/wiki/Social_networking_service
2. http://www.slideshare.net/ShrutiArya10/introduction-to-socialnetworking-sites-and-websites?qid=16074485-0621-4c19-8c0b-5937c59e69dd&v=&b=&from_search=1
3. http://www.uws.edu.au/__data/assets/pdf_file/0003/476337/The-Benefits-of-Social-Networking-Services.pdf
4. https://www.dreamgrow.com/top-15-most-popular-socialnetworking-sites/
5. http://mashable.com/2012/05/16/facebook-for-beginners/#zt.hb.qTluqt

Course Outcomes:

The learners

CO No.	Course Outcomes	PO1	PO2	PO3	PO4	PO5
CO-1	Gain knowledge on the social networking services and uses.	9	0	6	6	9
CO-2	Know the different Social Networking Sites.	9	0	6	6	6
CO-3	Deal with various Social Networking Apps.	9	0	6	6	6
Total		45	0	33	36	33
Weightage		4.76	0.00	6.18	5.41	8.33

Course Code	21UCSV1	INTRODUCTION TO ERP	TOTAL HOURS	CREDITS
			2	2
~~Core~~/~~Elective~~/Supportive		Value Added Course	Syllabus Version	2021-2022

Course Objectives:

- To provide Basic knowledge of ERP.
- To understanding of the concepts of ERP systems, their architecture, and working of different modules.
- To provide a contemporary and forward-looking on the theory and practice of ERP Technology.

Unit:1

Introduction to ERP: Introduction to computer – Parts of a Computer – Introduction to ERP – Evolution of ERP – What is ERP? – Reasons for the growth of the ERP market – The advantages of ERP – Why do many ERP implementations fail? Why are Packages being used now?

Unit:2

Enterprise – An Overview: Integrated Management Information – Business Modeling – Integrated Data model. ERP and Related Technologies: Introduction – Business Process Reengineering – Management Information System (MIS) – Decision Support System (DSS) – Executive Information System (EIS) – Data Warehousing – Data Mining – Online Analytical Processing (OLAP) –Supply Chain Management.

Unit:3

ERP Implementation Life Cycle: Introduction – Pre-evaluation Screening – Package Evaluation – Project Planning Phase – GAP analysis – Reengineering – Configuration – Implementation –*Team Training** – Post Implementation.

Course Outcomes:

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

CO1: Gain knowledge on the social networking services and uses.

CO2: Know the different Social Networking Sites.

CO3: Deal with various Social Networking Apps.

TEXTBOOKS :

1	Ellen Monk, Bret Wagner, *"Concepts In Enterprise Resource Planning"*, CENGAGE Learning, Third Edition, 2012.
2	D.P. Goyal, *"Enterprise Resource Planning: A Managerial Perspective"*,Tata McGraw – Hill Education Private Limited, 2012.

3	N.Venkateswaran, *"Enterprise Resource Planning"*, SCITECH Publications (INDIA) Pvt Ltd, 2010.
4	Veena Bansal, *"Enterprise Resource Planning: A Managerial Perspective"*, Pearson Publications, 2013.
E-REFERENCE :	
1	https://en.wikipedia.org/wiki/Enterprise_resource_planning
2	https://www.inc.com/encyclopedia/enterprise-resource-planning-erp.html

Mapping with Programme Specific Outcomes

CO / PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	1	3	1	1
CO2	1	1	3	9	1
CO3	1	1	9	1	9
CO4	1	3	1	1	9
CO5	9	1	1	1	9
Weightage	13	7	17	13	29
Weightage Percentage of Course Contribution of PO's	2.6	1.4	3.4	2.6	5.8