B.SC. COMPUTER SCIENCE

SEM	COURSE CODE	PART	COURSE	COURSE TITLE	INS. HRS. /WEEK	CREDIT	MARKS CIA	MARKS ESE	TOTAL
I	20U1LT1/LA1/LF1/LH1/LU1	I	Language – I		6	3	25	75	100
	20UCN1LE1	II	English – I		6	3	25	75	100
	20UCS1CC1	III	Core – I	Programming in C	5	5	25	75	100
	20UCS1CC2P		Core – II	C Programming Lab - Practical	3	2	20	80	100
	20UMA1AC1		Allied – I	Calculus and Differential Equations	5	4	25	75	100
	20UMA1AC2		Allied – II	Numerical Methods	3	2	25	75	100
	20UCN1AE1	IV	AEC-I	Value Education	2	2	100	-	100
				TOTAL	30	21			700
II	20U2LT2/LA2/LF2/LH2/LU2	I	Language – II		6	3	25	75	100
	20UCN2LE2	II	English – II		6	3	25	75	100
	20UCS2CC3	III	Core – III	Object Oriented Programming with C++	6	5	25	75	100
	20UCS2CC4P		Core – IV	C++ Programming Lab - Practical	3	2	20	80	100
	20UMA2AC3		Allied – III	Operations Research	4	3	25	75	100
	20UMA2AC4		Allied – IV	Statistics	3	2	25	75	100
	20UCN2SE1	IV	Skill Enhancement Course – I @	Soft Skills Development	2	2	100	-	100
				TOTAL	30	20			700
III	20U3LT3/LA3/LF3/LH3/LU3	I	Language – III		6	3	25	75	100
	20UCN3LE3	II	English – III		6	3	25	75	100
	20UCS3CC5	III	Core – V	Database Management Systems	4	4	25	75	100
	20UCS3CC6P		Core – VI	RDBMS Lab - Practical	3	2	20	80	100
	20UPH3AC5		Allied – V	Electricity and Magnetism	4	3	25	75	100
	20UPH3AC6P		Allied – VI	Applied Physics I - Practical	3	2	20	80	100
	20UCS3GE1	IV	Generic Elective – I #		2	2	-	100	100
	20UCN3AE2		AEC-II	Environmental Studies	2	2	100	-	100
				TOTAL	30	21			800
IV	20U4LT4/LA4/LF4/LH4/LU4	I	Language – IV		6	3	25	75	100
	20UCN4LE4	II	English – IV		6	3	25	75	100
	20UCS4CC7	III	Core – VII	Java Programming	5	3	25	75	100
	20UCS4CC8P		Core – VIII (a)	Java Programming Lab - Practical	3	2	10	40	50
	20UCS4CC8 I		Core – VIII (b)	Internship	-	2	10	40	50
	20UPH4AC7		Allied – VII	Electronics	5	3	25	75	100
	20UPH4AC8P		Allied – VIII	Applied Physics II - Practical	3	2	20	80	100
	20UCS4GE2	IV	Generic Elective – II #		2	2	-	100	100
	20UCN4EA	V	Extension Activities	NCC, NSS, etc.	-	1	-	-	-
				TOTAL	30	21			700
V	20UCS5CC9	III	Core – IX (a)	Web Technology	4	3	10	40	50
	20UCS5CC9P		Core – IX (b)	Web Technology Lab - Practical	2	2	10	40	50
	20UCS5CC10		Core – X	Data Structures and Algorithms	5	5	25	75	100
	20UCS5CC11		Core – XI	Computer Organization and Architecture	5	5	25	75	100
	20UCS5CC12		Core – XII	Operating Systems	5	5	25	75	100
	20UCS5DE1A/B		DSE – I **		5	4	25	75	100
	20UCS5SE2AP/BP	IV	Skill Enhancement Course – II @		2	2	-	100	100
	20UCS5SE3AP/BP		Skill Enhancement Course – III @		2	2	-	100	100
	20UCS5EC1		Extra Credit Course – I	General Intelligence for Competitive Examinations	-	4*	-	100*	100*
				TOTAL	30	28			700
VI	20UCS6CC13	III	Core – XIII	Computer Graphics and Multimedia	5	5	25	75	100
	20UCS6CC14		Core – XIV	Computer Networks	5	5	25	75	100
	20UCS6CC15		Core – XV	Microprocessor Fundamentals	5	5	25	75	100
	20UCS6CC16P1		Core – XVI (a)	Digital and Microprocessor Lab - Practical	3	3	10	40	50
	20UCS6CC16P2		Core – XVI (b)	Multimedia Lab - Practical	2	2	10	40	50
	20UCS6DE2A/B		DSE – II **		5	4	25	75	100
	20UCS6DE3AP/BP		DSE – III **		4	4	20	80	100
	20UCN6AE3	IV	AEC-III	Gender Studies	1	1	100	-	100
	20UCS6EC2		Extra Credit Course – II	Computer Science for Competitive Examinations	-	4*	-	100*	100*
	20UCSAECA		Extra Credit Course for all	Online Course	-	1*	-	-	-
				TOTAL	30	29			700
				GRAND TOTAL	180	140			4300

* Not Considered for Grand Total and CGPA.

GENERIC ELECTIVE FOR OTHER MAJOR DEPARTMENT

SEMESTER	COURSE CODE	COURSE TITLE
III	20UCS3GE1	Business Process Outsourcing
IV	20UCS4GE2	Web Design

@ SKILL ENHANCEMENT COURSE

SEMESTER	COURSE CODE	COURSE TITLE
V	20UCS5SE2AP	Software Testing Lab -Practical
	20UCS5SE2BP	VB .Net Lab –Practical
	20UCS5SE3AP	Data Structures Lab –Practical
	20UCS5SE3BP	Operating Systems Lab -Practical

** DISCIPLINE SPECIFIC ELECTIVE

SEMESTER	COURSE CODE	COURSE TITLE
V	20UCS5DE1A	Software Engineering
	20UCS5DE1B	VB.Net
VI	20UCS6DE2A	Open Source Technology
	20UCS6DE2B	Python Programming
	20UCS6DE3AP	Open Source Lab - Practical (20 + 80 = 100 Marks)
	20UCS6DE3BP	Python Programming Lab - Practical (20 + 80 = 100 Marks)

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
I	20UCS1CC1	CORE – I	PROGRAMMING IN C	5	5	100	25	75

Course Outcomes (COs):

On completion of the course, students will be able to

CO1. Use C language as the base for higher level course in programming
CO2. Acquire the basic constructs of programming languages
CO3. Apply structured approach in program design
CO4. Apply suitable logic in solving problems
CO5. Develop applications to solve real world problems

UNIT I **15 hours**

The C Character Set – Constants, Variables and Keywords – Types of C Constants – Rules for Constructing Integer Constants – Rules for Constructing Real Constants – Rules for Constructing Character Constants – Types of C Variables – Rules for Constructing Variable Names – C Keywords – Data Types – Form of a C Program – Comments in a C Program – Types of C Instructions – Type Declaration Instruction – Arithmetic Instructions – Integer and Float Conversions – Type Conversion in Assignments – Hierarchy of Operations – Associativity of Operators – Control Instructions in C – The Decision Control Structure – The *if* Statement – The *if-else* Statement – Nested *if-elses* – Forms of *if* – Use of Logical Operators – # The Conditional Operators #.

UNIT II **15 hours**

The Loop Control Structure – Loops – The *while* Loop – The *for* Loop – The *break* Statement – The *continue* Statement – The *do-while* Loop – The Case Control Structure – Decisions using switch – The *goto* Keyword – Functions – Passing Values between Functions – Scope Rule of Functions – # Using Library Functions #.

UNIT III **15 hours**

Advanced Features of Functions – Call by Value – Call by Reference – An Introduction to Pointers – Pointer Notation – Recursion – Data Types Revisited – Storage Classes in C – The C Preprocessor – Features of C Preprocessor – Macro Expansion – File Inclusion – Conditional Compilation – #*if* and #*elif* Directives – # Miscellaneous Directives # – The Build Process.

UNIT IV **15 hours**

Arrays – More on Arrays – Pointers and Arrays –Two Dimensional Arrays – Arrays of Pointers – # Three-Dimensional Array # – Strings – More about Strings – Pointers and Strings – Standard Library String Functions – Array of Pointers to Strings.

UNIT V **15 hours**

Structures – Array of Structures – Console Input / Output – Types of I/O – Console I/O Functions – File Input / Output – Data Organization – File Operations – Counting Characters, Tabs, Spaces – A File-Copy Program – File Opening Modes – # String (Line) I/O in Files #.

 # .... # Self-study portion

Text Book:

Yashavant Kanetkar, *Let Us C*, BPB Publications, New Delhi, Thirteenth Edition, 2013.

UNIT I	Chapters 1, 2, 3 & 7	**UNIT II**	Chapters 4, 5 & 6
UNIT III	Chapters 6, 7 & 8	**UNIT IV**	Chapters 9 & 10
UNIT V	Chapters 11, 12 & 13		

Books for Reference:

1. E. Balagurusamy, *Programming in ANSI C*, Tata McGraw Hill Education Private Ltd., New Delhi, Fifth Edition, 2011.
2. D. Ravichandran, *Programming in C*, New Age International (P) Ltd., First Edition, 1996.

Web Reference:

https://www.programiz.com/c-programming

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

Semester	Code	Title of the Course		Hours	Credits
I	**20UCS1CC1**	**PROGRAMMING IN C**		**5**	**5**

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓	✓	✓		✓		✓		
CO2	✓	✓				✓	✓	✓	✓	
CO3	✓	✓	✓	✓		✓	✓	✓	✓	
CO4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Number of matches (✓) = 40, Relationship: High										

Prepared by: **Checked by:**

Dr. O. A. Mohamed Jafar   Dr. G. Ravi

Note:

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
I	20UCS1CC2P	CORE – II	C PROGRAMMING LAB - Practical	3	2	100	20	80

Develop a Program to illustrate the use of

1. Arithmetic Statements

2. Different forms of if statements *(if, if-else and nested if-elses)*

3. Various Loop Control Structures *(while, do-while and for loop)*

4. Case Control Structure *(switch)*

5. Function

6. Call by Value and Call by Reference *(Pointers)*

7. Macro definitions

8. Arrays

9. String Handling Functions

10. Structures

11. Console I/O Functions

12. File

Prepared by: **Checked by:**

Dr. O. A. Mohamed Jafar   Dr. G. Ravi

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
II	20UCS2CC3	CORE – III	**OBJECT ORIENTED PROGRAMMING WITH C++**	6	5	100	25	75

Course Outcomes (COs):

On completion of the course, students will be able to

CO1. Acquire skills in object oriented programming concepts
CO2. Use object oriented concepts as the base for higher level course in programming
CO3. Differentiate structured and object oriented programming
CO4. Identify classes, objects, members of a class and the relationships among them needed for finding the solution to specific problem
CO5. Develop object oriented programs to solve real life problems

UNIT I   18 hours

Principles of Object-Oriented Programming – Software Evolution – Basic Concepts of Object-Oriented Programming – Benefits of OOP – Applications of OOP – Structure of C++ Program – Tokens – Keywords – Identifiers and Constants – Basic Data Types – User-Defined Data Types – Derived Data Types – Declaration of Variables – Operators – Manipulators – # Expressions and their types # – Control Structures.

UNIT II   18 hours

Functions – The Main Function – Function Prototyping – Call by Reference – Return by Reference – Inline Functions – Default Arguments – Recursion – Function Overloading – Classes and Objects – Specifying a Class – Defining Member Functions – A C++ program with Class – # Static Data Members – Static Member Functions # – Arrays of Objects – Objects as Function Arguments – Friendly Functions – Returning Objects.

UNIT III   18 hours

Constructors and Destructors – Constructors - Parameterized Constructors – Multiple Constructors in a Class – Copy Constructors – Destructors – Operator Overloading – Defining Operator Overloading – Overloading Unary Operators – Overloading Binary Operators – # Overloading Binary Operators using Friends # – Rules for Overloading Operators.

UNIT IV   18 hours

Inheritance: Extending Classes – Defining Derived Classes – Single Inheritance – Multilevel Inheritance – Multiple Inheritance – Virtual Base Classes – Pointers, Virtual Functions and Polymorphism – Pointers –Pointers to Objects –this Pointer – # Pointers to Derived Classes # – Virtual Functions – Pure Virtual Functions.

UNIT V   18 hours

Managing Console I/O Operations – C++ Streams – C++ Stream Classes – Unformatted I/O Operations – Formatted Console I/O Operations – Working with Files – Classes for File Stream Operations – Opening and Closing a File – Detecting end-of-file – # More about Open( ): File Modes #.

.... # Self-study portion

Text Book:

E. Balagurusamy, *Object-Oriented Programming with C++,* Tata McGraw Hill Education Private Ltd., New Delhi, Fifth Edition,2011.

UNIT I	Chapter 1, Chapter 2 (Section 2.6) & Chapter 3
UNIT II	Chapter 4 (Sections 4.1 – 4.7, 4.9, 4.10) & Chapter 5 (Sections 5.3 – 5.5, 5.11 – 5.16)
UNIT III	Chapter 6 (Sections 6.1 – 6.4, 6.7, 6.11) & Chapter 7 (Sections 7.1 – 7.5, 7.8)
UNIT IV	Chapter 8 (Sections 8.1 – 8.3, 8.5, 8.6, 8.9) & Chapter 9 (Sections 9.1 – 9.7)
UNIT V	Chapter 10 (Sections 10.1 – 10.5) & Chapter 11 (Sections 11.1 – 11.5)

Books for Reference:

1. Robert Lafore, *Object-Oriented Programming in Turbo C++*, Galgotia Publications Pvt. Ltd., New Delhi, Third Edition, Reprint-2014.
2. Bjarne Stroustrup, *The C++ Programming Language*, Addison-Wesley, New York, Third Edition, Eighth Impression, 2012.

Web References:

https://www.w3schools.com/cpp/cpp_oop.asp
https://www.geeksforgeeks.org/object-oriented-programming-in-cpp/

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

Semester	Code	Title of the Course		Hours	Credits
II	**20UCS2CC3**	**OBJECT ORIENTED PROGRAMMING WITH C++**		**6**	**5**

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	✓	✓		✓		✓		✓		
CO2	✓	✓	✓	✓		✓		✓		
CO3	✓	✓		✓		✓		✓	✓	✓
CO4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Number of matches (✓) = 38, Relationship: High										

Prepared by: **Checked by:**

Dr. O. A. Mohamed Jafar   Dr. G. Ravi

Note:

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
II	**20UCS2CC4P**	**CORE – IV**	**C++ PROGRAMMING LAB - Practical**	**3**	**2**	**100**	**20**	**80**

Develop a Program to illustrate the use of

1   Class and object.

2   a) new and delete operators
       b) Scope resolution operator

3   a) Call by value and call by reference
       b) Inline function

4.   a) Member functions defined inside the class
       b) Member functions defined outside the class

5.   a) Function overloading
       b) Friend function

6.   a) Arrays of objects
       b) Objects as function arguments

7.   a) Dummy and Parameterized Constructors
       b) Overloaded Constructors

8.   a) Unary Operator Overloading
       b) Binary Operator Overloading

9.   a) Single Inheritance
       b) Multiple Inheritance

10.   a) Single character and line-oriented input/output functions
       b) ios format functions

11.   File

Prepared by: **Checked by:**

Dr. O. A. Mohamed Jafar   Dr. G. Ravi

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
III	20UCS3CC5	Core – V	DATABASE MANAGEMENT SYSTEMS	4	4	100	25	75

Course Outcomes (COs):

At the end of this course, students will be able to

1. Identify the basic concepts and various data model used in database design
2. Apply normalization techniques for the given database application
3. Analyze the database using queries to retrieve records
4. Apply PL/SQL for processing database
5. Illustrate principles of client-server computing and mandatory access control

UNIT I   12 hours

Introduction to DBMS – Advantages – DBMS Services – Relational Model - RDBMS Terminology – The Relational Data Structure – Relational Data Integrity – Codd's Rules – Database Architecture and Data Modeling: Conceptual, Physical and Logical Models. E-R Model – #Components of E-R Model# – E-R Model Symbols.

UNIT II   12 hours

Normalization: Purpose of Normalization – How Normalization Support Database Design – Data Redundancy and Update Anomalies – Functional Dependencies – First Normal Form – 2nd Normal Form – Third Normal Form – Advanced Normalization – #BCNF#.

UNIT III   12 hours

Relational Algebra: Algebraic Operations – Select – Project – Set Operations – Cartesian product - Rename – Join – Division. SQL – Advantages – Types of SQL Commands – Creating table – Modify Table – Views – INSERT, UPDATE, and DELETE Operations – Queries – Aggregate Functions with Grouping and Having Clause – #Sub-Queries#.

UNIT IV   12 hours

Joins Operations - Introduction to PL/SQL – Variables – Data Types – Control Structure – Cursors – Iterative Control Statement – PL/SQL Exception – Triggers – Types of Triggers – #Procedures and Packages#.

UNIT V   12 hours

Client/Server Technology and Client Server Database: Introduction – Benefits of C/S Computing – Cost of C/S computing – Applications Architecture – Database Security – #Database Security Risks# – Dimension of Database Security – Data Security Requirements – Database Users – Protecting the Data within the Database – Roles – Granting and Revoking Privileges – System Availability Factors – Network Security.

#......# Self-Study Portion

Text Books:

1. Alexis Leon and Mathews Leon, *Database Management Systems*, Vikas Publishing House Pvt. Ltd., New Delhi.

   UNIT I   Chapters 5, 7, 8 & 9   **UNIT III**   Chapters 12, 14, 15 & 16
   UNIT IV   Chapter 21, Glossary of Database Terms: D   **UNIT V**   Chapters 32 & 27

2. Thomas M. Connolly, Carolyn E. Begg, *Database Systems A Practical Approach to Design*, Implementation and Management, Pearson Education, Fifth impression 2012.

   UNIT II   Chapter 13 (Sections 13.1 – 13.4 & 13.6 – 13.9) & Chapter 14 (14.2)

Books for Reference:

1. C.J. Date, A Kannan and S. Swaminathan, *An Introduction to Database Systems*, 8th Edition, Pearson Education Asia, 2009.
2. Ramez Elmasri and Shamkant B. Navathe, *Fundamentals of Database Systems*, 5th Edition, Pearson Education Ltd., 2009.

Web Reference:

http://www.db-book.com

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester	Code	Title of the Course								Hours	Credits
III	20UCS3CC5	DATABASE MANAGEMENT SYSTEMS								4	4

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓		✓	✓		✓	✓	✓		✓
CO2	✓	✓	✓	✓		✓	✓	✓	✓	
CO3	✓	✓	✓		✓	✓	✓	✓	✓	✓
CO4	✓	✓	✓		✓	✓		✓		✓
CO5	✓			✓	✓	✓	✓		✓	✓
Number of matches (✓) = 38, Relationship: High										

Prepared by: **Checked by:**

Mr. S. Syed Ibrahim   Mr. M. Abdullah

Note:

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
III	20UCS3CC6P	Core – VI	RDBMS LAB - Practical	3	2	100	20	80

SQL: Data Definition Languages:

1. Table Creation - Primary Key, Candidate key, Foreign key
2. Table Alteration - Rename table and Column name,
                     Add Column, Drop column,
                     Modify Column size and Data type
3. Drop Table

SQL: Data Manipulation Languages:

1. Insertion
2. Update with Case statement
3. String Operations – LIKE, NOT LIKE
4. Set Operations
5. Tuple Variables
6. Aggregate Functions (avg. min, max, sum, count) Grouping and Having Clause
7. Ordering Tuples
8. Nested Subqueries – using IN, NOT IN, SOME, ALL Clauses
9. Deletion – Using Subqueries, Aggregate Functions
10. Join Operations – Inner-join,
                     Outer-join – Left outer join
                                  Right outer join
                                  Full outer join
11. Views – View involving a single table
            View involving multiple tables

PL/SQL Procedure:

1. Reverse the String
2. Find Factorial number Using Recursive Function
3. Check given string is a palindrome or not
4. Prepare Student Mark Sheet
5. Employee Pay Roll
6. Using the cursor, list the top five average marks of students

Prepared by: **Checked by:**

Mr. S. Syed Ibrahim   Mr. M. Abdullah

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
III	20UCS3GE1	Generic Elective – I	**BUSINESS PROCESS OUTSOURCING**	2	2	100	-	100

Course Outcomes (COs):

At the end of this course, students will be able to

1. Acquire the necessary skills to manage various positions in the BPO sector
2. Utilize in-depth knowledge related to BPO Industry
3. Recognize various processes in BPO
4. Acquire exposure to Finance, Insurance and Human Resource BPO
5. Describe the different domains of BPO

UNIT I   **6 hours**

INTRODUCTION TO BPO: Basics of Business Process Outsourcing – History of BPO – Evolution of BPO – Global trends of BPO – Future of BPO.

UNIT II   **6 hours**

BPO INDUSTRY: Employment opportunities in BPO industry – Employee structure – Skill set required for BPO – Compensation levels – Future of BPO employee.

UNIT III   **6 hours**

MODELS OF BPO: BPO - Model and Types of Vendors – Transaction Processing BPO – Elements of back office services – Contact Centre BPO – Types of Call Centres – Components and working of a call centre – Offshoring – Offshore BPO – BPO Companies in India.

UNIT IV   **6 hours**

PROCESSES IN BPO: Financial Services – Insurance – Human Resource BPO – Activities involved in HR BPO – Career in HR BPO.

UNIT V   **6 hours**

BPO DOMAINS: Media and Entertainment BPO – Publishing BPO – Social media and BPO – Changing dynamics in Indian BPO Industry.

Text Book:

JMC Manual for Business Process Outsourcing

Books for Reference:

1. J. Bingham, Mastering Data Processing, Macmillan Publishing House, India, First Edition, 1983.
2. HD. Clifton, System Analysis for Business Data Processing, Prentice Hall Publications, New Delhi, Third Edition.
3. Kulkarni and Sarika, Business Process Outsourcing, Jaico Publishing House, New Delhi, Second Edition, 2005.
4. Shikapur and Deepak, BPO Digest, Ameya Inspiring Books, India, Second Edition, 2004.

Web Reference:

https://www.tutorial-reports.com/business/outsourcing/bpo

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester	Code	Title of the Course		Hours	Credits
III	20UCS3GE1	BUSINESS PROCESS OUTSOURCING		2	2
Course Outcomes (COs)	Programme Outcomes (POs)				Programme Specific Outcomes (PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓	✓	✓		✓		✓		
CO2	✓	✓				✓	✓	✓	✓	
CO3	✓	✓	✓	✓		✓	✓	✓	✓	
CO4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Number of matches (✓) = 40, Relationship: High										

Prepared by: **Checked by:**

Mr. S. Peerbasha   Dr. G. Ravi

Note:

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
IV	20UCS4CC7	Core – VII	JAVA PROGRAMMING	5	3	100	25	75

Course Outcomes (COs):

At the end of this course, students will be able to

1. Realize the meaning of platform independence (Write Once Run Anywhere) and understand the concept of Java Environment
2. Write reusable code using inheritance, interfaces, and packages
3. Implement the ideas of Multithreading and Exception handling techniques
4. Apply the concept of GUI using applets and streams
5. Develop small projects for real-life applications using Java

UNIT I   **15 hours**

Java Evolution - History – Features – Differences between C++ and Java – Java Environment – Java Development Kit – Application Programming Interface – Overview of Java Language – Introduction – Java Program Structure – Java tokens- Java Statements – Implementing a Java Program – Java Virtual Machine – Command line arguments – Constants, Variables and Data types – Basic Input/ Output – Simple Java Program – Operators and Expressions – Branching and Looping Statements.

UNIT II   **15 hours**

Classes, Objects and Methods – Defining a Class – Creating Objects – Accessing class members – Constructors – Method Overloading – Static Members – Inheritance – Extending a Class – Overriding Methods – Final variables and methods – Final Classes – Finalizer methods – Abstract Methods and Classes – Methods with Varargs – Visibility Control – Arrays, Strings and Vectors – One-dimensional Array – Creating an Array – Two-dimensional Arrays – Strings – Vectors – Wrapper Classes – Enumerated Types.

UNIT III   **15 hours**

Interfaces – Multiple Inheritance – Defining Interfaces – Extending Interfaces – Implementing Interfaces – Accessing Interface Variables – Packages - Java API Package – Java API Packages- Using System Packages – Naming conventions – Creating Packages, Accessing a Package, using a Package – adding a class to a package – Hiding Classes – Static import – Multithreaded Programming – Creating Threads – Extending the Thread Class – Implementing the 'Runnable' Interface – Stopping and Blocking a Thread – Life Cycle of a Thread – Using Thread Methods – Thread Exceptions – Thread Priority-Synchronization.

UNIT IV   **15 hours**

Managing Errors and Exceptions – Types of Errors – Exceptions – Syntax of Exception Handling Code – Multiple Catch Statements – Using Finally Statement – Throwing our own Exceptions – Managing Input/output Files in Java – Stream Classes – Byte Stream and Character Stream classes – Using Streams – Using the File Classes – Input / Output Exceptions – Creation of Files – Reading / Writing Characters – Reading / Writing Bytes – Handling Primitive Data Types – Random Access Files.

UNIT V   **15 hours**

Applet Programming - How Applets differ from Applications – Building Applet Code – Applet Life Cycle – Creating an Executable Applet – Applet Tag – Adding Applet to HTML File – Running the Applet – Passing Parameters to Applets – Displaying Numerical Values – Getting Input from the User – Graphics Programming – The Graphics Class.

Text Book:

E. Balagurusamy, *Programming with JAVA*, McGraw Hill India, Sixth Edition, 2019.

UNIT I	Chapters 2, 3, 4, 5, 6 & 7
UNIT II	Chapter 8 & Chapter 9 (Sections 9.1 – 9.8)
UNIT III	Chapters 10, 11 & Chapter 12 (Sections 12.1 – 12.9)
UNIT IV	Chapter 13 (Sections 13.1 – 13.7) & Chapter 16 (Sections 16.1 – 16.15)
UNIT V	Chapter 14 (Sections 14.1 – 14.16) & Chapter 15 (Sections 15.1 – 15.9)

Books for Reference:

1. Herbert Schild, *Java: The Complete Reference*, McGraw Hill Professional, Eleventh Edition, 2018.
2. P. Radha Krishna, *Object Oriented Programming through Java*, University Press (India) Private Ltd., 2011.

Web Reference:

https://www.javatpoint.com/java-tutorial

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

Semester	Code	Title of the Course		Hours	Credits
IV	20UCS4CC7	JAVA PROGRAMMING		5	3

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓	✓	✓	✓	✓		✓	✓	
CO2	✓	✓			✓	✓	✓	✓	✓	
CO3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Number of matches (✓) = 45, Relationship: Very High										

Prepared by: **Checked by:**

Dr. M. Mohamed Surputheen   Dr. K. Nafees Ahmed

Note:

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
IV	20UCS4CC8P	Core – VII (a)	**JAVA PROGRAMMING LAB - Practical**	3	2	50	10	40

Develop a Java Program to:

1. Demonstrate

   a) Keyboard input and screen output

   b) Control statements

2. Define a class, describe its constructor, and instantiate its object

3. Demonstrate method overloading

4. Demonstrate single and two-dimensional arrays

5. Demonstrate various methods in the String and StringBuffer class

6. Demonstrate methods in the vector class

7. Implement the single inheritance and method overriding

8. Implement the multiple inheritances

9. Implement the concept of packages

10. Implement the concept of threads by using Thread class and Runnable interface

11. Implement the concept of Exception Handling

12. Create a simple Applet

    a) To display a message

    b) For passing parameters

13. Use Graphics class to display basic shapes and fill them and set background and foreground colors

14. Demonstrate the use of I/O streams

Prepared by: **Checked by:**

 Dr. M. Mohamed Surputheen   Dr. K. Nafees Ahmed

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
IV	20UCS4CC8I	Core – VIII (b)	INTERNSHIP	-	2	50	10	40

1. At the end of Semester IV, during the summer vacation, the students should undergo an Internship in a reputed IT Company or in the IT Division of a reputed company after getting permission from the Department.

2. The minimum number of days for an Internship will be 30 days.

3. A Project Report and a Certificate of Attendance are to be submitted after completing the Internship for External Evaluation to the Department on the first day of Semester V.

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
IV	20UCS4GE2	Generic Elective – II	WEB DESIGN	2	2	100	-	100

Course Outcomes (COs):

At the end of this course, students will be able to

1. Describe the basics of the Internet
2. Recognize the different Internet devices and their functions
3. Acquire the knowledge of HTML
4. Apply the knowledge of Internet Technologies
5. Develop Web Pages for real-world problems

UNIT I   **6 hours**

Introduction to the Internet – Computers in Business – Networking – Internet – E-Mail – Resource Sharing – Gopher – World Wide Web – Usenet – Telnet – Bulletin Board Service – Wide Area Information Service.

UNIT II   **6 hours**

Internet Technologies – Modem – Internet Addressing – Physical Connections – Telephone Lines – Internet Browsers – Internet Explorer – Netscape Navigator.

UNIT III   **6 hours**

Introduction to HTML – History of HTML – HTML Documents – Anchor Tag – Hyperlinks – Head and Body Sections – Header Section – Title – Prologue – Links – Colorful Web Page – Comment Lines.

UNIT IV   **6 hours**

Designing the Body Section – Heading Printing – Aligning the Headings – Horizontal Rule – Paragraph – Tab Settings – Ordered and Unordered Lists – Lists – Unordered Lists – Ordered Lists.

UNIT V   **6 hours**

Table Handling – Tables – Table Creation in HTML – Frames – Frameset Definition – Frame Definition – Nested Framesets.

Text Book:

C. Xavier, *World Wide Web Design with HTML*, Tata McGraw Hill Company Limited, New Delhi, 19th Reprint 2008.

UNIT I	Chapter 1	**UNIT II**	Chapters 2 & 3
UNIT III	Chapters 4 & 5	**UNIT IV**	Chapters 6 & 7
UNIT V	Chapters 8 & 10		

Books for Reference:

1. Thomas A. Powell, *HTML & XHTML,* TMH, Fourth Edition, Thirteenth Reprint, 2007
2. N.P. Gopalan and J. Akilandeswari, *Web Technology A Developer's Perspective*, PHI, Second Printing, 2008

Web References:

https://www.geeksforgeeks.org/the-internet-and-the-web/
https://www.w3schools.com/html

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester	Code	Title of the Course		Hours	Credits
IV	20UCS4GE2	WEB DESIGN		2	2

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO2	✓	✓	✓	✓	✓	✓	✓	✓		
CO3	✓	✓						✓	✓	✓
CO4	✓	✓	✓	✓	✓			✓	✓	✓
CO5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Number of matches (✓) = 41, Relationship: High										

Prepared by: **Checked by:**

Dr. S A. Jameel   Mr. A. Jainulabudeen

Note:

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
V	20UCS5CC9	Core – IX (a)	WEB TECHNOLOGY	4	3	50	10	40

Course Outcomes (COs):

On completion of the course, students will be able to

CO1. Understand the various web technologies.
CO2. Analyze the concept of DHTML.
CO3. Create interactive web pages using HTML and CSS.
CO4. Develop knowledge of XML fundamentals and usage of XML technology.
CO5. Apply the functionalities of scripting languages.

UNIT I   12 hours

HTML: Introduction – SGML – Outline of an HTML Document – Head Section – Body Section – HTML Forms.

UNIT II   12 hours

Java Script: Introduction – Language Elements – Objects of Java Script – Other Objects – Arrays.

UNIT III   12 hours

VB Script: Introduction – Embedding VBScript Code in an HTML Document – Comments – Variables – Operators – Procedures – Conditional Statements – Looping Constructs – Object and VB Script – Cookies.

UNIT IV   12 hours

Dynamic HTML (DHTML): Introduction – Cascading Style Sheets (CSS) – DHTML Document Object Model and Collections – Event Handling.

UNIT V   12 hours

Extensible Mark-Up Language (XML): Introduction – HTML vs XML – Syntax of the XML Document – XML Attributes – XML Validation – XML DTD – The Building Blocks of XML Documents – DTD Elements – DTD Attributes – DTD Entities – DTD Validation – XSL – XSL Transformation.

Text Book:

N.P. Gopalan and J. Akilandeswari, *Web Technology – A Developer's Perspective*, Prentice Hall of India Private Ltd, New Delhi, Second Edition, 2016.

Book for Reference:

Jeffrey C. Jackson, *Web Technologies – A Computer Science Perspective*, Pearson Prentice Hall, Nineth Impression, 2011.

Web References:

https://www.w3schools.com
https://www.tutorialspoint.com/vbscript/index.htm
https://www.javatpoint.com/dhtml

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester	Code	Title of the Course								Hours	Credits
V	20UCS5CC9	WEB TECHNOLOGY								4	3

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓	✓	✓	✓	✓		✓	✓	
CO2		✓	✓	✓		✓	✓		✓	✓
CO3	✓	✓			✓	✓	✓		✓	✓
CO4		✓		✓	✓	✓	✓	✓	✓	
CO5	✓	✓	✓	✓		✓			✓	✓
Number of matches (✓) = 36, Relationship: High										

Prepared by: **Checked by:**

Dr. S. A. Jameel   Dr. S. Mohamed Iliyas

Note:

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
V	**20UCS5CC9P**	**Core – IX (b)**	**WEB TECHNOLOGY LAB - PRACTICAL**	**2**	**2**	**50**	**10**	**40**

Develop a

1. Home page of your own using html tags.

2. HTML document to provide a form that collect names and telephone numbers.

3. JavaScript program to add two integer numbers.

4. JavaScript program that reads five integers and determines the largest and the smallest integers in the group.

5. Java Script program that reads integers and determines the square root of the integer using square root method of Math object.

6. Java Script program to find the number of occurrences of a given number in a set of stored numbers.

7. VB Script program to find the Fibonacci series using Do While Loop.

8. VB Script program to display array elements.

9. VB Script program to generate the days of the week using Select case.

10. Web page to put a Library Catalog using XML.

Prepared by: **Checked by:**

Dr. S. A. Jameel   Dr. S. Mohamed Iliyas

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
V	20UCS5CC10	Core – X	DATA STRUCTURES AND ALGORITHMS	5	5	100	25	75

Course Outcomes (COs):

On completion of the course, students will be able to

CO1. Understand the basic concept of data structures and arrays.
CO2. Acquire the knowledge of stack and queue.
CO3. Implement the use of linked list and their operations.
CO4. Describe various applications of trees and graphs.
CO5. Apply suitable algorithms for solving sorting and searching problems.

UNIT I   **15 hours**

Introduction and Overview: Basic Terminology – Data Structures – Data Structure Operations – Mathematical Notations and Functions – Control Structures – Algorithms: Time-space Trade-off – Complexity of Algorithms – Asymptotic Notations – Arrays – Introduction – Linear Array, Representation of Linear Array in Memory, Traversing Linear Arrays, Inserting and Deleting, Two Dimensional Arrays – Representation of Two Dimensional Array in Memory.

UNIT II   **15 hours**

Stacks- Array Representation of Stacks – Operations on Stack – Arithmetic Expressions: Polish Notation – Reverse Polish Notation – Evaluation of a postfix expression – Transforming Infix Expression into Postfix – Recursion – Queues – Representation of Queues – Operations on Queues – Deques.

UNIT III   **15 hours**

Linked List – Representation of Linked Lists in Memory – Traversing a Linked List – Insertion into a Linked List – Deletion from a Linked List – Two-way Linked Lists – Operations on Two-way Lists.

UNIT IV   **15 hours**

Trees - Binary Trees – Representing Binary Trees in Memory – Traversing Binary Tree – Threads – Binary Search Tree – Graph Theory – Terminology – Sequential Representation of Graph: Adjacency Matrix, Path Matrix – Traversing a Graph, Breadth First Search, Depth First Search.

UNIT V   **15 hours**

Sorting and Searching: Sorting – Bubble Sort – Insertion Sort – Selection Sort – Merge Sort – Quick Sort – Heap Sort – Searching – Liner Search – Binary Search.

Text Book:

Seymour Lipschutz (Schaum's Series), *Data Structures*, McGraw Hill Education (India) Private Limited Ltd., New Delhi, Revised First Edition, 2013.

Books for Reference:

ReemaThareja, *Data Structures Using C*, Oxford University Press, New Delhi, Second Edition, 2014.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester	Code	Title of the Course		Hours	Credits
V	20UCS5CC10	DATA STRUCTURES AND ALGORITHMS		5	5
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓	✓			✓				
CO2	✓	✓	✓	✓		✓	✓			
CO3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Number of matches (✓) = 40, Relationship: High										

Prepared by: **Checked by:**

Dr. M. Mohamed Surputheen   Dr. G. Ravi

Note:

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
V	20UCS5CC11	Core – XI	**COMPUTER ORGANIZATION AND ARCHITECTURE**	5	5	100	25	75

Course Outcomes (COs):

On completion of the course, students will be able to

CO1. Understand the various types of number systems and the usage of binary codes.
CO2. Apply Boolean laws and theorems to simplify and implement Boolean expressions.
CO3. Design and analyse combinational circuits.
CO4. Design and analyse sequential circuits.
CO5. Understand the architecture and functionality of a central processing unit.

UNIT I   **15 hours**

Number Systems – Decimal, Binary, Octal and Hexadecimal Systems – Conversion from one system to another – Addition, Subtraction, Multiplication and Division of Binary, Octal and Hexadecimal Numbers – Binary Codes – 8421, 2421, Excess-3, Gray – Weighted and Non-weighted codes, Reflected Code, Self-complementary Codes – BCD Codes – Alphanumeric Codes.

UNIT II   **15 hours**

Basic Logic Gates – Universal Logic – Boolean Laws and Theorems – Boolean Expressions – Sum of Products – Product of Sums – Simplification of Boolean Expressions – Karnaugh Map Method (up to 4 Variables) – Implementation of Boolean Expressions using Gate Networks.

UNIT III   **15 hours**

Combinational Circuits – Multiplexers – Demultiplexers – Decoders – Encoders – Arithmetic Building Blocks – Half and Full Adders – Half and Full Subtractors – Parallel adder – 2's Complement Adder-Subtractor.

UNIT IV   **15 hours**

Sequential Circuits – Flip Flops – RS, Clocked RS, D, JK, T and Master-Slave Flip Flops – Shift Register – Counters – Asynchronous and Synchronous counters – Mod *n* Counter – Ring Counter**.**

UNIT V   **15 hours**

Register Transfer and Microoperations: Register Transfer Language – Register Transfer – Arithmetic Microoperations – Logic Microoperations – Arithmetic Logic Unit – Central Processing Unit: General Register Organization – Stack Organization – Instruction Formats – Addressing Modes – Data Transfer and Manipulation.

Text Books:

1. Albert Paul Malvino, Donald P. Leach and Goutam Saha, *Digital Principles and Applications*, TMH, Sixth Edition, 2007.

2. Morris Mano M, *Computer System Architecture*, PHI, Third Edition, 2008.

Book for Reference:

Thomas C. Bartee, *Digital Computer Fundamentals*, Tata McGraw Hill, 6th Edition, 25th Reprint, 2006.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

Semester	Code	Title of the Course		Hours	Credits
V	20UCS5CC11	COMPUTER ORGANIZATION AND ARCHITECTURE		5	5
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓			✓	✓				✓
CO2	✓	✓	✓	✓	✓	✓	✓		✓	
CO3	✓	✓	✓	✓	✓	✓	✓		✓	✓
CO4	✓	✓	✓	✓	✓	✓	✓		✓	✓
CO5	✓	✓		✓	✓	✓	✓		✓	✓
Number of matches (✓) = 39, Relationship: High										

Prepared by: **Checked by:**

Dr. T. Abdul Razak   Dr. G. Ravi

Note:

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
V	20UCS5CC12	Core – XII	OPERATING SYSTEMS	5	5	100	25	75

Course Outcomes (COs):

On completion of the course, students will be able to

CO1. Understand the basic concepts of Operating Systems.
CO2. Analyse the different kinds of memory management techniques.
CO3. Acquire the knowledge of process state, process scheduling and handling deadlocks.
CO4. Realize the device functionalities and the relationships between the devices and the processor.
CO5. Understand the basic concept of file, its various allocation strategies and access methods.

UNIT I   **15 hours**

Operating System Overview – Basic Concepts and Terminologies – Operating System as Resource Manager – Process View Point – Hierarchical and Extended Machine View – I/O Programming and Interrupt Programming – I/O Programming – Interrupt Structure and Processing.

UNIT II   **15 hours**

Memory Management – Single Contiguous Allocation – Multiprogramming – Partitioned Allocation – Relocatable Partitioned Memory Management – Paged Memory Management – Page Removal Algorithms – Thrashing – Segmented Memory Management – Segmented and Demand Paged Memory Management.

UNIT III   **15 hours**

Process Management – Process State Model – Job Scheduling – Process Scheduling – Multiprocessor Systems – Process Synchronization – Resolving Deadlocks.

UNIT IV   **15 hours**

Device Management – Techniques – Device Characteristics – I/O Traffic Controller – I/O Scheduler and Device Handlers – Virtual Devices – Spooling.

UNIT V   **15 hours**

Information Management: File System Model – Symbolic, Basic File System – Access Control Verification – Logical, Physical File System – Allocation Strategy, Device Strategy Modules.

Text Book:

S.E. Madnick and J. J. Donovan, *Operating Systems*, McGraw Hill International Book Co, New Delhi, 2017.

Books for Reference:

1. Harvey M. Deitel, *An Introduction to Operating Systems*, Addison-Wesley Publishing Co., New York, 1984.

2. James L. Peterson and Abraham Silbertschatz, *An Introduction to Operating Systems*, Addison-Wesley Publishing Co., New York, 1987.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

Semester	Code	Title of the Course		Hours	Credits
V	20UCS5CC12	OPERATING SYSTEMS		5	5

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓	✓	✓	✓	✓		✓		✓
CO2		✓	✓	✓			✓	✓	✓	✓
CO3	✓	✓		✓	✓	✓		✓	✓	✓
CO4	✓		✓	✓	✓		✓	✓	✓	✓
CO5		✓	✓	✓	✓	✓				✓
Number of matches (✓) = 37, Relationship: High										

Prepared by: **Checked by:**

Dr. D.I. George Amalarethinam   Dr. G. Ravi

Note:

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
V	20UCS5DE1A	DSE – I	SOFTWARE ENGINEERING	5	4	100	25	75

Course Outcomes (COs):

On completion of the course, students will be able to

CO1. Understand the different software process models.
CO2. Acquire the knowledge of system engineering process.
CO3. Realize the system design process and design quality.
CO4. Understand the various software testing methods.
CO5. Understand the software quality assurance and metrics.

UNIT I   **15 hours**

Software and Engineering: The Nature of Software – The Unique Nature of WebApps – Software Engineering – The Software Process – Software Myths – A Generic Process Model – Prescriptive Process Models: The Waterfall Model – Incremental Process Model – Evolutionary Process Models – Concurrent Models – Specialized Process Models: Component-Based Development – The Formal Methods Model – Aspect-Oriented Software Development.

UNIT II   **15 hours**

Understanding Requirements: Requirements Engineering – Establishing the Groundwork – Eliciting Requirements – Developing Use Cases – Building the Requirements Model – Negotiating Requirements – Validating Requirements – Requirements Analysis – UML Models That Supplements the Use Case – Data Modeling Concepts – Flow-Oriented Modeling – Creating a Behavioral Model.

UNIT III   **15 hours**

Design Concepts: The Design Process -- Design Concepts – The Design Model – Architectural Design: Software Architecture – Architectural Genres – Architectural Styles – Architectural Design – Assessing Alternative Architectural Designs – Architectural Mapping Using Data Flow.

UNIT IV   **15 hours**

Software Testing Strategies: A Strategic Approach to Software Testing – Test Strategies for Conventional Software – Unit Testing – Integration Testing – Validation Testing – System Testing – The Art of Debugging – Testing Conventional Applications: Software Testing Fundamentals – White-Box Testing – Basis Path Testing – Control Structure Testing – Black-Box Testing – Object-Oriented Testing Methods**.**

UNIT V   **15 hours**

Quality Concepts: Software Quality – Achieving Software Quality -- Formal Technical Reviews – Software Quality Assurance: Elements of SQA – SQA Tasks, Goals and Metrics – Statistical SQA – Software Reliability – Process and Project Metrics: Metrics in the Process and Project Domains -- Software Measurement – Metrics for Software Quality – Establishing a Software Metrics Program.

Text Book:

Roger S. Pressman, *Software Engineering - A Practitioner's Approach*, McGraw Hill International Edition, Seventh Edition, 2010.

UNIT I	Chapter 1 (Sections 1.1, 1.2, 1.3, 1.4 & 1.6), Chapter 2 (Sections 2.1, 2.3 & 2.4)
UNIT II	Chapter 5 (Sections 5.1 -- 5.7), Chapter 6 (Sections 6.1,6.2 & 6.4) & Chapter 7 (Sections 7.2 & 7.3)
UNIT III	Chapter 8 (Sections 8.2,8.3 & 8.4), Chapter 9 (Sections 9.1 – 9.6)
UNIT IV	Chapter 17 (Sections 17.1, 17.3,17.6, 17.7 & 17.8) & Chapter 18 (Sections 8,1, 18.3, 18.4, 18.5 & 18.6) & Chapter 19 (Section 19.4)
UNIT V	Chapter 14 (Sections 14.2 & 14.4), Chapter 15 (Section 15.6), Chapter16 (Sections 16.2 16.3, 16.5 & 16.6) & Chapter 25 (Sections 25.1 - 25.3 & 25.6)

Books for Reference:

1. Shari Lawrence Fleeger and Joanne M. Atlee, *Software Engineering: Theory and Practice*, Pearson Education South Asia, New Delhi, Fourth Edition, Third Impression 2013.
2. Ian Sommerville, *Software Engineering*, Pearson Education Asia, New Delhi, Ninth Edition, 2015.
3. Jibitesh Mishra, *Software Engineering*, Pearson Education, First Edition, 2011.
4. Rohit Khurana, *Software Engineering Principles and Practices*, Vikas Publishing House, Second Edition, 2010.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

Semester	Code	Title of the Course		Hours		Credits
V	20UCS5DE1A	SOFTWARE ENGINEERING		5		4

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓	✓	✓		✓	✓	✓	✓	
CO2	✓	✓			✓	✓	✓		✓	✓
CO3	✓			✓		✓		✓	✓	
CO4	✓	✓		✓	✓	✓	✓	✓		✓
CO5	✓	✓	✓		✓	✓	✓		✓	✓
Number of matches (✓) = 36, Relationship: High										

Prepared by: **Checked by:**

 Mr. M. Abdullah   Dr. K. Nafees Ahamed

Note:

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50

Relationship	Very Poor	Poor	Moderate	High	Very High

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
V	20UCS5DE1B	DSE – I	VB .NET	5	4	100	25	75

Course Outcomes (COs):

On completion of the course, students will be able to

CO1. Acquire the working knowledge of window-based application development.
CO2. Use the controls and functions for creating user interface design.
CO3. Utilize the various dialog controls for more interactions.
CO4. Apply the object oriented concepts in program development.
CO5. Design and implement database connectivity using ADO .NET.

UNIT I   **15 hours**

The .NET Framework and the Common Language Runtime – Building VB.NET Applications – The Visual Basic Integrated Development Environment - The Visual Basic Language: Keywords – Visual Basic Statements – Constants – Variables – Data Types – Arrays – Strings – Operators – Making Decisions with If ... Else Statements – Using Select Case – Making Selections with Switch and Choose – Looping Statements – Do Loop – For Loop – For Each...Next Loop – While Loop – With Statement.

UNIT II   **15 hours**

Sub Procedures and Functions - Understanding Scope - Handling Exception – Creating Sub Procedures – Creating Functions – Windows Forms – Creating Windows Applications – Adding Control to Forms – Handling Events – MsgBox Function – MessageBox.Show Method - InputBox Function – Working with Multiple Forms – Handling Mouse Events – Handling Keyboard Events – Text Boxes – Rich Text Boxes – Labels.

UNIT III   **15 hours**

Buttons – Checkboxes – Radio Buttons – Panels – Group Boxes – List Boxes – Checked List Boxes – Combo Boxes – Picture Boxes – Scroll Bars – Splitters – Pickers - Timers – Menus – Built in Dialog Boxes – Open File Dialogs – Save File Dialogs – Font Dialogs – Color Dialogs.

UNIT IV   **15 hours**

Image Lists – Tree Views – List Views – Toolbars – Status Bars – Progress Bars – Tab Controls – Object-Oriented Programming – Creating Classes – Creating Objects – Creating Modules – Creating Constructors – Creating Data Members - Creating Methods – Object-Oriented Inheritance – Access Modifiers – Inheriting from a Base Class – Using Public Inheritance – Using Protected Inheritance – Using Private Inheritance.

UNIT V   **15 hours**

Databases – Accessing Data with the Server explorer – Accessing Data with Data Adaptors and Datasets – Working with ADO.NET – Overview of ADO .NET Objects – Using Basic SQL – Creating a New Data Connection – Creating a Dataset – Populating a Dataset – Displaying Data in a Data Grid – Selecting a Data Provider – Data Access Using Data Adapter Controls - Connecting to an MS Jet Database – Using Relational Databases – Adding Multiple tables to a Dataset – Using Data Views – Simple Binding – Complex Binding – Binding Data to Controls – Navigating in Datasets.

Text Book:

Steven Holzner, *Visual Basic .NET Programming Black Book*, Dreamtech Publisher, Edition Aug. 2007.

UNIT I	Chapters 1 & 2	**UNIT II**	Chapters 3, 4 & 5
UNIT III	Chapters 6, 7, 8 & 9	**UNIT IV**	Chapters 10, 11 & 12
UNIT V	Chapters 21 & 22		

Books for Reference:

1. C. Muthu, *Visual Basic .Net*, Vijay Nicole Imprints Pvt. Ltd. Publisher, 2007.
2. Shirish Chavan, *Visual Basic .Net*, Pearson Education, Third Imprint 2009.

Web References:

https://www.tutorialspoint.com/vb.net/index.htm
https://www.javatpoint.com/vb-net
https://www.youtube.com/watch?v=1D7UDmxdu3g

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

Semester	Code	Title of the Course		Hours	Credits
V	**20UCS5DE1B**	**VB .NET**		**5**	**4**

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	✓	✓	✓	✓	✓	✓	✓	✓		✓
CO2		✓			✓	✓	✓	✓	✓	
CO3	✓		✓	✓	✓	✓			✓	✓
CO4	✓	✓	✓	✓	✓	✓	✓	✓		✓
CO5	✓	✓	✓	✓	✓	✓		✓	✓	✓
Number of matches (✓) = 40, Relationship: High										

Prepared by: **Checked by:**

Mr. A. Jainulabudeen   Dr. S. Mohamed Iliyas

Note:

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
V	20UCS5SE2AP	SEC – II	SOFTWARE TESTING LAB - PRACTICAL	2	2	100	--	100

1. Install Selenium IDE; Develop a test suite containing minimum 4 test cases for different formats.

2. Perform a test suite for any two websites

3. Install Selenium Web Server and demonstrate it using a script in Java.

4. Develop and test a program to login a specific web page.

5. Develop and test a program to update 5 employee records into table into Excel file

6. Develop and test a program to select the number of students who have scored more than 75 in any one subject.

7. Develop and test a program to find out list of employees having salary greater than Rs. 25,000/- and age between 35 and 45 years.

8. Develop and test a program to provide total number of objects available on a web page.

9. Develop and test a program to get the number of list items in a list / combo box.

10. Develop and test a program to count the number of check boxes on a page checked and unchecked count.

11. Develop a test plan document for Library Management System.

Prepared by: **Checked by:**

Mr. M. Abdullah   Dr. K. Nafees Ahamed

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
V	**20UCS5SE2BP**	**SEC – II**	**VB .NET LAB - PRACTICAL**	**2**	**2**	**100**	**--**	**100**

Develop a VB .NET program to

1. a) Accept any character from keyboard and display whether it is vowel or not.

   b) Find the area of a circle (Using console application).

2. Reverse a given number (Using window application).

3. Create and validate a login form using select case.

4. Find the factorial of a given number using function.

5. Handle any three types of exceptions.

6. Illustrate the use of MsgBox and InputBox Functions

7. Illustrate the use of Checkbox, Radio Buttons and List Box Control

8. Create a stopwatch using timer control.

9. Implement a text editor with cut, copy, paste, save and close operations using menus.

10. Illustrate the use of Tree View and List View.

11. Accept 5 values from Combo Box and display average in MsgBox function using class.

12. Develop a database application to store the details of students using ADO.NET.

13. Develop a database application using ADO.NET to demonstrate insert and delete operations.

Prepared by: **Checked by:**

Mr. A. Jainulabudeen   Mr. M. Abdullah

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
V	20UCS5SE3AP	SEC – III	DATA STRUCTURES LAB - PRACTICAL	2	2	100	--	100

Develop a C program to

1. Find mean and standard deviation of n numbers.

2. Find

      i. Row Sum

      ii. Column Sum

      iii. Trace Sum (Sum of Diagonal Elements)

      iv. Sum of all the elements

   for a given matrix.

3. Perform Matrix addition and multiplication operations

4. Search for an element using sequential and binary search.

5. Perform the following types of sorting:

      i. Bubble sort

      ii. Insertion sort

      iii. Selection sort

6. Merge two arrays into a single array.

7. Find the factorial of a number using recursion.

8. PUSH and POP an element from a STACK.

9. Insert and delete an element from a QUEUE.

10. Insert and delete a node in a linked list.

Prepared by: **Checked by:**

Dr. M. Mohamed Surputheen   Dr. G. Ravi

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
V	20UCS5SE3BP	SEC – III	OPERATING SYSTEMS LAB – PRACTICAL	2	2	100	--	100

1. Demonstrate various UNIX commands.

2. Demonstrate various vi editor commands.

3. Develop a C program for systems calls of UNIX OS (OPENDIR, READDIR, CLOSEDIR).

4. Develop a C program to simulate UNIX commands (cp and ls).

5. Develop a shell program to
   a) Check the given number is odd or even.
   b) Find the factorial of a given number.
   c) Swap two integer values.

6. Develop a shell program, which accepts the name of a file from the standard input and perform the following tests on it:
   a) File existence   b) File readable   c) File writeable
   d) Both readable and writeable

7. Develop a menu driven Shell program to copy, edit, rename, and delete a file.

8. Develop a C program for implementation of
   a) Priority scheduling algorithm.
   b) Round robin scheduling algorithm.
   c) FCFS scheduling algorithm.

Prepared by: **Checked by:**

Dr. D.I. George Amalarethinam   Dr. A.R. Mohamed Shanavas

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
VI	20UCS6CC13	Core – XIII	COMPUTER GRAPHICS AND MULTIMEDIA	5	5	100	25	75

Course Outcomes (COs):

On completion of the course, students will be able to

CO1. Understand the basics of Computer Graphics, Different Graphics Systems and Applications of Computer Graphics.
CO2. Learn Algorithms for Scan Conversion and filling of Basic Objects and their Comparative Analysis.
CO3. Use of Geometric Transformations on Graphical Objects and their Application in Composite form.
CO4. Implement Image Manipulation and Enhancement.
CO5. Create 2D animations using tools.

UNIT I   **15 hours**

Introduction: The Origin of Computer Graphics – Interactive Graphics Display Point Plotting Techniques: Incremental Methods-Line Drawing Algorithms – Symmetrical DDA – Simple DDA – Bresenham's Algorithm – Circle Generators. Line Drawing Displays: The CRT- Beam Penetration CRT – The Shadow Mask CRT – Inherent Memory Devices.

UNIT II   **15 hours**

Two Dimensional Transformations: Translation – Scaling – Rotation – Matrix Representations – Concatenation. Clipping and Windowing: Line Clipping Algorithm – Cohen – Sutherland Line Clipping Algorithm – Midpoint Subdivision – Polygon Clipping – Graphical Input Device: Mouse –Tablets – Light Pen.

UNIT III   **15 hours**

Graphical Input Techniques: Positioning Techniques – Pointing and Selection – Three-Dimensional Graphics Rotation: Translation – Scaling – Rotation – Hidden Surface Elimination: The Depth – Buffer Algorithm – Scan Line Coherence Algorithms – Span Coherence Algorithm – Area Coherence Algorithms – Warnock's Algorithm.

UNIT IV   **15 hours**

Multimedia: Definitions – Uses of Multimedia. Text: Fonts and Faces – Using Text in Multimedia – Computers and Text – Font Editing and Design Tools – Hypermedia – Hypertext. Image: Making still Images – Color – Image File Formats. Sound: The Power of Sound – Digital Audio – MIDI Sound – Multimedia System Sounds – Audio File Formats.

UNIT V   **15 hours**

Animation: The Power of Motion – Principles of Animation – Animation by Computer – Making Animation that work. Video: Using Video – How Video works and is displayed – Digital Video Containers – Obtaining Video Clips – Stages of Multimedia Project – Hardware – Software Authoring Systems – Multimedia Skills: Multimedia Team

Text Book:

1. William M. Newman and Robert F. Sproull, *Principles of Interactive Computer Graphics*, Tata McGraw – Hill Publishing Company Ltd., Second Edition, 1997.

   UNIT I   Chapters 1, 2 & 3
   UNIT II   Chapters 4, 5 & 11
   UNIT III   Chapter 12, Chapter 22 (Section 22.1) & Chapter 24

2. Tay Vaughan, *Multimedia: Making it Work*, Tata McGraw – Hill Education Pvt. Ltd., Eighth Edition, 2011.

   UNIT IV   Chapters 1, 2, 3 & 4
   UNIT V   Chapters 5, 6, 7 & 8

Books for Reference:

1. Donald Hearn and M. Pauline Baker, *Computer Graphics*, Prentice Hall of India, Second Edition, Reprint, 2007.
2. Steven Harrington, *Computer Graphics – A Programming Approach*, Tata McGraw-Hill International Edition, Second Edition, 1987.
3. David Hillman, *Multimedia Technology and Applications*, Galgotia Publications Pvt. Ltd., 1998.

Web References:

https://www.javatpoint.com/computer-graphics-tutorial
https://www.geeksforgeeks.org/computer-graphics-2/

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester	Code	Title of the Course		Hours		Credits
VI	20UCS6CC13	COMPUTER GRAPHICS AND MULTIMEDIA		5		5

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓	✓	✓		✓		✓		
CO2	✓	✓				✓	✓	✓	✓	
CO3	✓	✓	✓	✓		✓	✓	✓	✓	
CO4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Number of matches (✓) = 40, Relationship: High										

Prepared by: **Checked by:**

Dr. A.R. Mohamed Shanavas   Dr. G. Ravi

Note:

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
VI	20UCS6CC14	Core – XIV	COMPUTER NETWORKS	5	5	100	25	75

Course Outcomes (COs):

On completion of the course, students will be able to

CO1. Understand the fundamental concepts of network topologies and protocols.
CO2. Know the working principles of data communication and switching networks.
CO3. Acquire the knowledge of protocols for datalink layers and internetworking devices.
CO4. Analyse the various routing and congestion control algorithms.
CO5. Implement the protocols for transport and application layers.

UNIT I   **15 hours**

Introduction – Uses of Computer Networks – Network Hardware: Personal Area Networks –Local Area Networks – Metropolitan Area Networks – Wide Area Networks – Internetworks - Network Software: Protocol Hierarchies – Design Issues for the Layers – Connection-Oriented Versus Connectionless Service – Service Primitives. Reference Models: OSI Reference Model – TCP/IP Reference Model.

UNIT II   **15 hours**

Physical Layer: Guided Transmission Media – Digital Modulation and Multiplexing: Baseband Transmission – Frequency Division Multiplexing – Public Switched Telephone Network: Structure of the Telephone System – Politics of Telephones – Local Loop: Modems, ADSL, and Fiber – Trunks and Multiplexing – Switching.

UNIT III   **15 hours**

Data Link Layer: Data Link Layer Design Issues: Services Provided to the Network Layer – Framing – Error Control – Flow Control. Error Detection and Correction – Elementary Data Link Protocols – Sliding Window Protocols – Medium Access Control Sub–layer: Data Link Layer Switching: Uses of Bridges – Learning Bridges – Spanning Tree Bridges – Repeaters, Hubs, Bridges, Switches, Routers, and Gateways**.**

UNIT IV   **15 hours**

Network Layer: Network Layer Design Issues – Routing Algorithms: Optimality Principle – Shortest Path Algorithm – Distance Vector Routing – Link State Routing – Hierarchical Routing – Broadcast Routing – Congestion Control Algorithms: Approaches to Congestion Control – Traffic-Aware Routing – Admission Control – Network Layer in the Internet – IP Version 4 Protocol – IP Addresses.

UNIT V   **15 hours**

Transport Layer: Transport Service: Services Provided to the Upper Layers –Transport Service Primitives – Berkeley Sockets – Elements of Transport Protocols – Application Layer: DNS: Domain Name System – DNS Name Space – Domain Resource Records – Electronic Mail: Architecture and Services – User Agent – Message Format.

Text Book:

Andrew S. Tanenbaum and David J. Wetherall, *Computer Networks*, PHI, 5th Edition, 2011.

UNIT I	Chapter 1 (Sections 1.1, 1.2, 1.3.1 to 1.3.4, 1.4.1, 1.4.2)
UNIT II	Chapter 2 (Sections 2.2, 2.5.1, 2.5.3, 2.6)
UNIT III	Chapter 3 (Sections 3.1, 3.2, 3.3, 3.4) & Chapter 4 (Section 4.8.4)
UNIT IV	Chapter 5 (Sections 5.1, 5.2.1, 5.2.2, 5.2.4 to 5.2.7, 5.3.1 to 5.3.3, 5.6.1, 5.6.2)
UNIT V	Chapter 6 (Sections 6.1.1 to 6.1.3, 6.2) & Chapter 7 (Sections 7.1.1, 7.1.2, 7.2.1 to 7.2.3)

Books for Reference:

1. Behrouz A. Forouzan, *Data Communications and Networking*, Tata McGraw-Hill, Fourth Edition, 2007.
2. William Stallings, *Data and Computer Communication*, PHI, Tenth Edition, 2013.

Web Reference:

https://www.slideshare.net/pawan1809/computer-networks-a-tanenbaum-5th-edition

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester	Code	Title of the Course		Hours	Credits
VI	20UCS6CC14	**COMPUTER NETWORKS**		5	5

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO2	✓	✓	✓	✓		✓	✓	✓		✓
CO3	✓				✓	✓	✓	✓	✓	
CO4	✓	✓	✓		✓	✓		✓		
CO5	✓	✓		✓		✓	✓		✓	✓
Number of matches (✓) = 36, Relationship: High										

Prepared by: **Checked by:**

Dr. G. Ravi   Mr. S. Syed Ibrahim

Note:

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
VI	20UCS6CC15	Core – XV	**MICROPROCESSOR FUNDAMENTALS**	5	5	100	25	75

Course Outcomes (COs):

On completion of the course, students will be able to

CO1. Understand the basics of microprocessors.
CO2. Understand the architecture of a microprocessor and its internal operation.
CO3. Classify the various instructions and study their usage.
CO4. Demonstrate programming proficiency by developing simple assembly language programs.
CO5. Identify the different ways of interfacing memory and I/O with a microprocessor.

UNIT I   **15 hours**

Word Length of a Microprocessor – Evolution of Microprocessors – Single Chip Microcontrollers – Embedded Microprocessors – Hardware, Software and Firmware – Central Processing Unit – Memory – Buses – Processing Speed of a Computer – Classification of Computers – Von Neumann Architecture – Harvard Architecture – Data Flow Architecture – Types of Microprocessors – Microprocessor Applications.

UNIT II   **15 hours**

Intel 8085 Microprocessor Architecture – Register – Status Flags – Pin Configuration – Opcode and Operands – Instruction Formats – Instruction Cycle – Fetch Operation – Execute Operation – Addressing Modes.

UNIT III   **15 hours**

Instruction Set of 8085 – Data Transfer Instructions – Arithmetic Instructions – Logical Instructions – Shift and Rotate Instructions – Branch Instructions – Jump, Call and Return – Stack Instructions – I/O, Machine Control and other Instructions – Assembly Language – Assemblers – Stacks – Subroutines – Macros.

UNIT IV   **15 hours**

Assembly Language Programs – Addition, Subtraction, Multiplication and Division of 8-bit numbers – Decimal Addition and Subtraction – Multibyte Addition and Subtraction – 1's and 2's Complements – Assembly and Disassembly of a Byte – Sum of a Series – Block Data Transfer – Finding the Smallest and the Biggest Number in an Array – Arranging a Series of Numbers in Descending and Ascending Order.

UNIT V   **15 hours**

Peripheral Devices and Interfacing – Address Space Partitioning – Memory and I/O Interfacing – Data Transfer Schemes – Interrupts of Intel 8085 – Interfacing Devices and I/O Devices – I/O Ports – Programmable Peripheral Interface – Delay Subroutines – Seven-Segment Displays – Types of Seven-Segment Displays – Interfacing Seven-segment Displays.

Text Book:

Badri Ram, *Fundamentals of Microprocessors and Microcomputers*, DhanpatRai Publications, Sixth Revised and Enlarged Edition, 2010.

Book for Reference:

Ramesh Gaonkar, *Microprocessor Architecture, Programming and Applications with 8085*, Prentice Hall of India, Fifth Edition, 2002.

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester	Code	Title of the Course		Hours	Credits
VI	20UCS6CC15	MICROPROCESSOR FUNDAMENTALS		5	5

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓	✓	✓		✓	✓		✓	✓
CO2	✓	✓		✓		✓	✓		✓	
CO3	✓	✓	✓	✓		✓	✓		✓	✓
CO4		✓	✓	✓		✓	✓	✓	✓	
CO5	✓	✓	✓	✓		✓	✓	✓	✓	✓
Number of matches (✓) = 38, Relationship: High										

Prepared by: **Checked by:**

Dr. T. Abdul Razak   Dr. G. Ravi

Note:

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
VI	20UCS6CC16P1	Core – XVI (a)	DIGITAL AND MICROPROCESSOR LAB - PRACTICAL	3	3	50	10	40

Digital Experiments:

1. Study of Logic Gates.

2. Study of De Morgan's Theorems.

3. Construction of Basic Logic Gates using Universal Logic.

4. Karnaugh Map Reduction of Boolean Expressions (Three variable expressions only).

5. Half Adder and Full Adder using AND, OR, NOT & EXOR only.

6. Half Subtractor and Full Subtractor using AND, OR, NOT & EXOR only.

7. Study of 4-bit Parallel Adder / Subtractor using Logic Gates and MSI Devices (IC7483).

8. Study of Multiplexer / Demultiplexer.

Microprocessor Experiments:

Develop assembly language programs for:

1. 8-bit Addition, Subtraction, Multiplication and Division.

2. Multibyte Addition and Subtraction.

3. Decimal Addition and Subtraction.

4. Assembly and Disassembly of a Byte.

5. Sum of a Series.

6. Block Data Transfer.

7. Smallest and Biggest Number in an Array.

8. Sorting of Numbers (Ascending and Descending order).

Prepared by: **Checked by:**

Dr. T. Abdul Razak   Dr. G. Ravi

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
VI	20UCS6CC16P2	Core – XVI (b)	MULTIMEDIA LAB – PRACTICAL	2	2	50	10	40

Designing Software

1. (i) Handling different file formats and interchanging them, changing the resolution, color, grayscales and size of the images.
   (ii) Using brushes and creating multicolor real life images.

2. Cropping, rotating, overlapping, superimposing and pasting photos on a page.

3. Create a single image from selected portions of many.

4. Develop a commercial brochure with background tints.

5. Create an image with multi-layers of images and texts.

6. Apply masks and filtering on images.

Animation Software

Develop an image(s) and do the following.

1. Basic Drawing and Painting.

2. Working with Strokes and Fills.

3. Create Custom Colors, Gradients, and Line Styles Transforming and Grouping Objects.

4. Create and Manage Multiple Layers.

5. Convert Text into Shapes.

6. Animate using motion, shape, tweening and actions.

Prepared by: **Checked by:**

Dr. A. R. Mohamed Shanavas   Mr. A. Jainulabudeen

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
VI	20UCS6DE2A	DSE – II	OPEN SOURCE TECHNOLOGY	5	4	100	25	75

Course Outcomes (COs):

On completion of the course, students will be able to

CO1. Understand the fundamental knowledge of PHP.
CO2. Illustrate the advanced concepts like strings, arrays and functions.
CO3. Design Web based applications.
CO4. Design Database applications.
CO5. Develop AJAX based applications.

UNIT I   **15 hours**

Essential PHP: Getting PHP – Creating Your Development Environment – Creating a First PHP Page – Running PHP Page –Mixing HTML and PHP – Adding Comments – Working with Variables – Storing Data in Variables – Creating Constants – Understanding Data Types. Operators and Flow Control: String Operators – Ternary Operator – if Statement – else Statement – elseif Statement – switch Statement – for Loops – while Loops – foreach Loop.

UNIT II   **15 hours**

Strings and Arrays: String Functions – Converting Strings – Formatting Strings – Building Arrays – Modifying Arrays – Deleting Arrays – PHP Array Functions – Extracting Data from Arrays – Sorting Arrays – Splitting and Merging Arrays – Creating Functions: Function Creation – Passing Some Data – Passing by Reference – Returning Data – Returning References.

UNIT III   **15 hours**

Reading Data in Web Pages: Setting Web Pages to Communicate – Handling Text Fields – Handling Check Boxes – Handling Radio Buttons – Handling List Boxes – Handling Buttons – PHP Browser Handling Power: Server Variables – HTTP Headers – Redirecting Browsers – Handling Form Data – Performing Data Validation – Client-Side Data Validation.

UNIT IV   **15 hours**

Working with Databases: Creating MySQL Database – Creating New Table – Putting Data – Accessing Database – Updating Databases – Inserting New Data Items – Deleting Records. Sessions, Cookies, and FTP: Setting Cookie – Reading Cookie – Setting Cookie's Expiration – Deleting Cookies – Working with FTP – Downloading Files – Uploading Files.

UNIT V   **15 hours**

AJAX: Getting Started – Writing AJAX – Creating XMLHttpRequest Object – Opening XMLHttpRequest Object – Handling Downloaded Data – Ajax with PHP – Passing Data to Server with GET – Passing Data to Server with POST – Handling XML – Handling XML with PHP.

Text Book:

Steven Holzner, *PHP: The Complete Reference*, McGraw-Hill Education (India) Edition 2008, 24th Reprint 2017.

UNIT I	Chapter 1& Chapter 2	**UNIT II**	Chapter 3 & Chapter 4
UNIT III	Chapter 5 & Chapter 6	**UNIT IV**	Chapter 10 & Chapter 11
UNIT V	Chapter 12		

Books for Reference:

Lynn Beighley and Michael Morrison, *Head First PHP & MySQL*, O'Reilly, Fifth Indian Reprint 2010.

Web Reference:

https://www.w3schools.com/php/
https://www.tutorialspoint.com/php/index.htm
https://www.phptpoint.com/php-tutorial/
https://www.javatpoint.com/php-tutorial

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester	Code	Title of the Course		Hours	Credits
VI	20UCS6DE2A	**OPEN SOURCE TECHNOLOGY**		5	4

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓					✓	✓			
CO2	✓	✓	✓			✓	✓	✓		
CO3		✓	✓	✓	✓	✓	✓	✓	✓	✓
CO4		✓	✓	✓	✓	✓	✓	✓	✓	✓
CO5		✓	✓	✓	✓	✓	✓	✓	✓	✓
Number of matches (✓) = 36, Relationship: High										

Prepared by: **Checked by:**

Dr. K.Nafees Ahamed   Mr. S. Syed Ibrahim

Note:

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
VI	20UCS6DE2B	DSE – II	**PYTHON PROGRAMMING**	5	4	100	25	75

Course Outcomes (COs):

On completion of the course, students will be able to

CO1. Understand the building blocks of Python programming.
CO2. Apply the various control structures and functions to real time problems.
CO3. Perform the List, tuple and Dictionary concepts.
CO4. Implement the MySQL queries and file handling operations with applications.
CO5. Understand the concepts of classes and object-oriented programming.

UNIT I   15 hours

Introduction: Using Python – Input, Processing and Output: Displaying Output with the print Function – Comments – Variables - Reading Input from the Keyboard – Simple Functions: Introduction to Functions - Defining and Calling a Function – Local Variables – Passing Arguments to Functions – Global Variables and Global Constants.

UNIT II   15 hours

Decision Structures and Boolean Logic: if Statement – if-else Statement – Comparing Strings – Nested Decision Structures and the if-elif-else Statement – Logical Operators – Boolean Variables – Repetition Structures: While Loop: a Condition-Controlled Loop – for Loop: a Count-Controlled Loop – Sentinels – Input Validation Loops – Nested Loops.

UNIT III   15 hours

Value-Returning Functions and Modules: Introduction to Value-Returning Functions: Generating Random Numbers – Writing Your Own Value – Returning Functions – math Module – Storing Functions in Modules – Files and Exceptions: Introduction to File Input and Output – Using Loops to Process Files – Processing Records – Exceptions.

UNIT IV   15 hours

Lists and Tuples: Sequences – Introduction to Lists – List Slicing – Finding Items in Lists with the in Operator – List Methods and Useful Built-in Functions – Copying Lists – Processing Lists – Two-Dimensional Lists - Tuples – More About Strings: Basic String Operations – String Slicing – Testing, Searching and Manipulating Strings – Dictionaries and Sets: Dictionaries – Sets – Serializing Objects.

UNIT V   15 hours

Classes and Object-Oriented Programming: Procedural and Object-Oriented Programming – Classes – Working with Instances – Techniques for Designing Classes – Inheritance: Introduction to Inheritance – Polymorphism – Getting MySQL for Python – Import MySQL for Python – MySQLDb – Connecting with a Database.

Text Books:

1. Tony Gaddis, *Starting Out with Python*, Addison-Wesley Pearson Education, 2nd Edition, 2012.

UNIT I	Chapter 2 Sections 2.3 - 2.6, Chapter 3 Sections 3.1, 3.2, 3.4, 3.5, 3.6
UNIT II	Chapter 4 Sections 4.1 - 4.6, Chapter 5 Sections 5.2, 5.3, 5.5, 5.6, 5.7
UNIT III	Chapter 6 Sections 6.1 - 6.4, Chapter 7 Sections 7.1 - 7.4
UNIT IV	Chapter 8 Sections 8.1 - 8.9, Chapter 9 Sections 9.1 - 9.3, Chapter 10 Sections 10.1 - 10.3
UNIT V	Chapter 11 Sections 11.1 - 11.4, Chapter 12 Sections 12.1, 12.2

2. Albert Lukaszewski, *MySQL for Python*, Packt Publisher, 1st Edition, 2010.

UNIT V	Chapter 1

Book for Reference:

Mark Lutz, *Programming Python*, O'Reilly Media, Inc. Publisher, 4th Edition, 2010.

Web References:

https://onlinecourses.nptel.ac.in/noc19_cs59/preview
https://www.learnpython.org/

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes

Semester	Code	Title of the Course		Hours	Credits
VI	20UCS6DE2B	**PYTHON PROGRAMMING**		5	4

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓		✓	✓	✓	✓	✓	✓	✓	
CO2		✓	✓	✓		✓	✓		✓	✓
CO3	✓	✓		✓	✓	✓		✓	✓	
CO4	✓		✓		✓	✓	✓	✓	✓	✓
CO5		✓	✓	✓	✓	✓		✓	✓	✓
Number of matches (✓) = 38, Relationship: High										

Prepared by: **Checked by:**

Mr. S. Syed Ibrahim   Dr. K. Nafees Ahmed

Note:

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
VI	20UCS6DE3AP	DSE – III	OPEN SOURCE LAB - PRACTICAL	4	4	100	20	80

Develop a PHP program to illustrate the use of

1. Different forms of if statements (if, else and elseif).

2. Various loop control structures (for, foreach and while).

3. Case control structure (switch).

4. String functions (chr, ord, str_shuffle, str_replace, strcmp and substr).

5. Arrays (sorting of names).

6. Arrays (splitting and merging).

7. Function (finding salary).

8. Text Fields, Check Boxes, List Boxes, Buttons and Radio Buttons (Registration Form).

9. Data Validation (Checking Age).

10. Javascript for client side data validation (Checking Date).

11. Cookies.

12. FTP.

MySQL

13. Perform DDL and DML commands using MySQL.

14. Develop a Database application for Employee Details.

AJAX

15. Develop a program to fetch the message from text file

16. Develop a program to pass data to the server.

17. Develop a program to select a product using XML.

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Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
VI	20UCS6DE3BP	DSE – III	**PYTHON PROGRAMMING LAB – PRACTICAL**	4	4	100	20	80

Develop a Python program to

1. Demonstrate different Number data types.

2. Calculate Euclidean distance between two points by taking input from the user.

3. Find the NCR values of a given number using Functions.

4. Print whether a number is positive/negative using if-else statement.

5. Find whether the given value is prime or not using if-elif statement.

6. Compute the number of vowels, consonants and words in a file.

7. Print all of the unique words in a file in alphabetical order.

8. Define a module to find odd or even numbers between 1 and 100 and import the module to another program.

9. Create a list and perform the following methods

    a) insert()   b) remove()   c) append()   d) len()   e) pop()

10. Create a tuple and perform the following operations

    a) Concatenation   b) Repetition   c) Membership

    d) Access items   e) Slicing

11. Sort (ascending and descending) a dictionary by value.

12. Prepare a Payroll List using Class.

13. Find the area of a rectangle using Class and Object.

14. Perform various database operations (Create, Insert, Delete, Update) using MySQL.

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Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
VI	20UCS6EC2	ECC – II	**COMPUTER SCIENCE FOR COMPETITIVE EXAMINATIONS**	--	4*	100*	--	100*

UNIT I Programming Languages (C, C++, Java,)

UNIT II Database Management Systems, Data Structures and Algorithms

UNIT III Computer Organization and Architecture, Microprocessors

UNIT IV Operating Systems**,** Computer Networks

UNIT V Computer Graphics and Multimedia, Web Technology,

VB .Net, PHP, Python Programming

Prepared by: **Checked by:**

Mr. S. Syed Ibrahim   Dr. G. Ravi