B.SC. COMPUTER SCIENCE

SEM	COURSE CODE	PART	COURSE	COURSE TITLE	INS. HRS. /WEEK	CREDIT	MARKS		TOTAL
							CIA	ESE	
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: Dr. O. A. Mohamed Jafar

Checked by: 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**	**3**	**2**	**100**	**25**	**75**

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: Dr. O. A. Mohamed Jafar

Checked by: 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**	**3**	**2**	**100**	**25**	**75**

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):

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 – 2^{nd} 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**	**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):

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: Mr. S. Peerbasha

Checked by: 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):
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: Dr. M. Mohamed Surputheen

Checked by: 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**	**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	**20UCS4CC8**	**Core – VIII (b)**	**INTERNSHIP**	**-**	**2**	**50**	**-**	**50**

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):

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:

Dr. S A. Jameel

Checked by:

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