FATIMA COLLEGE, MADURAI

DEPARTMENT OF COMPUTER SCIENCE

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

MAJOR CORE COURSES INCLUDING PRACTICALS : 60 CREDITS

S.NO	SEM.	COURSE CODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. Mks
1.	I	19B1CC1	Programming in C	6	4	40	60	100
2.		19B1CC2	Lab – I(Programming in C)	6	3	40	60	100
3.	II	19B2CC3	Programming in C++	6	4	40	60	100
4.		19B2CC4	Lab – II (programming in C++)	6	3	40	60	100
5.	III	19B3CC5	Data structures and algorithms	6	4	40	60	100
6.		19B3CC6	Lab –III(data structures in C++)	6	3	40	60	100
7.	IV	19B4CC7	Relational database system concepts	6	4	40	60	100
8.		19B4CC8	Lab - IV (Visual programming)	6	3	40	60	100
9.	V	B5CC9	Programming in Java	5	5	25	75	100
10.		B5CC10	Operating system concepts	5	5	25	75	100
11.		B5CC11	Lab-V (Programming in Java)	6	3	40	60	100
12.		B5CC12	Project - I	4	3	40	60	100
13.	VI	B6CC13	J2EE programming	5	5	25	75	100
14.		B6CC14	Data communications and networking	5	5	25	75	100
15.		B6CC15	Lab-VI (J2EE programming)	6	3	40	60	100
16.		B6CC16	Project – II (outside)	-	3	40	60	100

ALLIEDCOURSES- 20 CREDITS

S.NO	SEM.	COURSE CODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. MKs
1.	I	19B1ACP1	Digital Principles & Applications (ALLIED - I -Offered by Physics)	5	5	40	60	100
2.	II	19B2AC2	Computer System Architecture	5	5	40	60	100
3.	III	19B3ACM1	Linear Programming (ALLIED – III - Offered by Maths)	5	5	40	60	100
4.	IV	19B4ACM2	Algebra And Graph Theory (ALLIED- IV – Offered by Maths)	5	5	40	60	100

ELECTIVES-15 CREDITS

S.No	SEM.	COURSECODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. Mks
1.	**V**	**B5ME1**	**Software Engineering**	**5**	**5**	**40**	**60**	**100**
2.	**V**	**B5ME2**	**Python Programming**	**5**	**5**	**40**	**60**	**100**
3.	**V**	**B5ME3**	**Data Mining And Data Warehousing**	**5**	**5**	**40**	**60**	**100**
4.	**V**	**P5MEB1**	**Programming With C**	**5**	**5**	**40**	**60**	**100**
5.	**VI**	**B6ME4**	**Computer Graphics**	**5**	**5**	**40**	**60**	**100**
6.	**VI**	**B6ME5**	**Software Testing**	**5**	**5**	**40**	**60**	**100**
7.	**VI**	**B6ME6**	**Cloud Computing**	**5**	**5**	**40**	**60**	**100**
8.	**VI**	**B6ME7**	**Introduction To Artificial Intelligence**	**5**	**5**	**40**	**60**	**100**

9.	**VI**	**B6ME8**	**Mobile Computing Using Android**	**5**	**5**	**40**	**60**	**100**
10.	**VI**	**B6ME9**	**Big Data Fundamentals**	**5**	**5**	**40**	**60**	**100**

PART – IV – 20 CREDITS

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

S.No	SEM.	COURSE CODE	COURSE TITLE	HRS	CREDIT	CIA Mks	ESE Mks	TOT. Mks
1.	I	19G1VE1	Value Education	1	1	50	-	50
2.		19B1NME	Animation Techniques (NME)	2	2	40	60	100
3.	II	19G2VE2	Value Education	1	1	50	-	50
4.		19B2NME	Animation Techniques (NME)	2	2	40	60	100
5.	III	19G3EN1	Environmental Education	1	1	50	-	50
6.		19B3SB1	**Skill Based Elective-** Internet Programming Paper:I Introduction To Internet	2	2	40	60	100
7.	IV	19G4EN2	Environmental Awareness	1	1	50	-	50
8.		19B4SB2	**Skill Based Elective-** Internet Programming Paper:II - Web Designing Using HTML And WordPress	2	2	40	60	100
9.	V	B5SB3	**Skill Based Elective-** Internet Programming	2	2	50	50	100

			Paper:III – Client Side Programming Using Java Script & CSS					
10.		B5SB4	**Skill Based Elective**-Internet Programming Paper:IV – Server Side Programming Using ASP.Net	2	2	50	50	100
11.	VI	B6SB5	**Skill Based Elective**-Internet Programming Paper: V - Server Side Programming Using PHP	2	2	50	50	100
12.		B6SB6	**Skill Based Elective**-Internet Programming Paper: VI -Web Services Development Using XML	2	2	50	50	100

OFF-CLASS PROGRAMME

ADD-ON COURSES

Courses	Hrs.	Credits	Semester in which the course is offered	CIA Mks	ESE Mks	Total Marks
Photo Editing Techniques (Offered by the Dept. of Computer Science instead of Computer Applications offered by PGDCA)	60	2	I	40	60	100
ONLINE SELF LEARNING COURSE-Foundation Course - Arts	40	3	I	50	-	50
ONLINE SELF LEARNING COURSE-Foundation Course - Science	40	3	II	50	-	50
ETHICAL STUDIES-Value Education	15	2	I-VI	-	-	100
HUMAN RIGHTS	15	2	V	-	-	100

OUTREACH PROGRAMME- Reach Out to Society through Action **ROSA**	-	3	V & VI			100
PROJECT	30	4	VI	40	60	100
READING CULTURE	10/Semester	1	II-VI	-	-	-
MOOC COURSES (Department Specific Courses) * Students can opt other than the listed course from UGC-SWAYAM portal as well as from NPTEL	-	Respective Credits allotted by UGC	-	-	-	100
TOTAL		24 +				

EXTRA CREDIT COURSE

Course Code	Courses	Hrs.	Credits	Semester in which the course is offered	CIA Mks	ESE Mks	Total Marks
19UGSLB1	**SELF LEARNING COURSE** **for ADVANCED LEARNERS (offered for III UG)** **DIGITAL IMAGE PROCESSING**	-			40	60	100

OFF CLASS PROGRAMS :
19UGOLCB1 – ONLINE CERTIFICATE COURSE IN PHOTO EDITING TECHNIQUES
19UGOLCB2 – ONLINE CERTIFICATE COURSE IN WEB DESIGNING

OLD

2019 – 2020
I B.Sc. Computer Science - I SEMESTER
MAJOR CORE
19B1CC1 – PROGRAMMING IN C

HRS/WEEK: 6 **CREDITS: 4**

COURSE OUTCOMES

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

CO1: Identify the basic concepts needed for program development
CO2: Apply the basic concepts and develop program to find solutions for simple problems
CO3: Design programs to solve complex problems by using suitable control statements
CO4: Analyze the problem and design efficient program using functions
CO5: Use array and structure to handle volume of data

SYLLABUS

UNIT- I : Introduction To C Programming **(18 Hrs)**

The C Character set – Identifiers and Keywords – Data types – Constants - Variable and Arrays – Declarations – Expressions – Statements – Symbolic Constants. *OPERATORS AND EXPRESSIONS:* Arithmetic Operators – Unary Operators – Relational and Logical Operators – Assignment Operators – The Conditional Operator – Library Functions.

UNIT- II : Data Input And Output **(18 Hrs)**

The getchar() Function – The putchar() Function – The scanf() Function – The printf() Function– The gets() and puts() Functions. *CONTROL STATEMENTS:* The if-else Statement – The While Statement – The Do-While Statement – The For statement – Nested Control Structures – The Switch Statement – The Break Statement – The Continue Statement – The Comma Operator – The goto Statement.

UNIT- III : Functions and Storage Classes **(18Hrs)**

FUNCTIONS : Defining a Function – Accessing a Function – Function Prototypes - Passing arguments to a Function – Recursion. *STORAGE CLASSES*: Storage classes-Automatic variables-External variables- Static variables.

UNIT- IV : Arrays and Strings **(18 Hrs)**

ARRAYS: Defining an Array – Processing an Array – Passing Arrays to Functions – Multidimensional Arrays. *STRINGS:* Defining a string – NULL Character – Initialization of Strings – Reading and Writing a String – Processing the Strings – Character arithmetic - Searching and Sorting of Strings.

UNIT- V : Structures and Files **(18 Hrs)**

STRUCTURES: Defining a Structure - Processing a Structure - User-Defined Data Types (typedef) - - Passing Structures to a Function. *FILES:* Why Files - Opening and Closing a Data file – Reading and writing a Data file - Processing a Data file - Unformatted Data files.

TEXT BOOK

Programming with C, Byron S Gottfried & Jitender Kumar Chhabra, 3rd Edition, Tata McGraw Hill Education Pvt. Ltd., New Delhi, 2014.
Chapters : 2- 4, 6-10, 12-13

REFERENCE BOOKS

1. ***Programming in ANSI C***, E. Balagurusamy, 2nd Edition, Tata McGrawHill Publishing company Ltd, New Delhi, 2004.
2. ***Let Us C***, Yashwant P. Kanetkar, 8th Edition, BPB Publications, New Delhi, 2007.
3. ***C Programming Language***, 2nd Edition, by B. W. Kernighan & D. M. Ritchie, Prantice Hall Publications, 2011.

NEW

I B.Sc. Computer Science
SEMESTER –I
For those who joined in 2019 onwards

5%

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
UACS	19B1CC1	PROGRAMMING IN C	MAJOR	6	4

COURSE DESCRIPTION

This course helps to provide the fundamental knowledge of a programming language and its features which enhances the user to write general purpose application programs.

COURSE OBJECTIVES

- To introduce and form a firm foundation in programming
- To stress the importance of clarity , simplicity and the efficiency in writing programs

SYLLABUS

UNIT I : INTRODUCTION TO C PROGRAMMING (18 Hrs)

The C Character set – Identifiers and Keywords – Data types – Constants - Variable and Arrays – Declarations – Expressions – Statements – Symbolic Constants. *OPERATORS AND EXPRESSIONS:* Arithmetic Operators – Unary Operators – Relational and Logical Operators – Assignment Operators – The Conditional Operator – Library Functions.

UNIT II : DATA INPUT AND OUTPUT (18 Hrs)

The getchar() Function – The putchar() Function – The scanf() Function – The printf() Function– The gets() and puts() Functions. *CONTROL STATEMENTS:* The if-else Statement – The While Statement – The Do-While Statement – The For statement – Nested Control Structures – The Switch Statement – The Break Statement – The Continue Statement – The Comma Operator – The goto Statement.

UNIT III : FUNCTIONS AND STORAGE CLASSES (18Hrs)

FUNCTIONS : Defining a Function – Accessing a Function – Function Prototypes - Passing arguments to a Function – Recursion. *STORAGE CLASSES*: Storage classes-Automatic variables-External variables- Static variables.

UNIT IV : ARRAYS AND STRINGS (18 Hrs)

ARRAYS: Defining an Array – Processing an Array – Passing Arrays to Functions – Multidimensional Arrays. *STRINGS:* Defining a string – NULL Character – Initialization of Strings – Reading and Writing a String – Processing the Strings – Character arithmetic - Searching and Sorting of Strings.

UNIT V :STRUCTURES AND FILES (18 Hrs)

STRUCTURES: Defining a Structure - Processing a Structure - User-Defined Data Types (typedef) - - Passing Structures to a Function. *FILES:* Why Files -

Opening and Closing a Data file – Reading and writing a Data file - Processing a Data file - Unformatted Data files.

SELF STUDY: DYNAMISM :(For CIA Only)
Unit I: Library Functions
Unit II: The comma operator
Unit IV: String Functions
Unit V: Unformatted Data Files

TEXT BOOK

Programming with C, Byron S Gottfried &Jitender Kumar Chhabra, 3rd Edition, Tata McGraw Hill Education Pvt. Ltd., New Delhi, 2014.
Chapters : 2- 4, 6-10, 12-13

REFERENCE BOOKS

1. ***Programming in ANSI C***, E. Balagurusamy, 2nd Edition, Tata McGrawHill Publishing company Ltd, New Delhi, 2004.
2. ***Let Us C***, Yashwant P. Kanetkar, 8th Edition, BPB Publications, New Delhi, 2007.
3. ***C Programming Language***, 2nd Edition, by B. W. Kernighan & D. M. Ritchie, Prantice Hall Publications, 2011.

OLD

2019 - 2020
I B.Sc. Computer Science - II SEMESTER
MAJOR CORE
19B2CC3 – PRORAMMING IN C++

HRS/WEEK: 6 **CREDITS: 4**

COURSE OUTCOMES

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

CO1: Compare Procedure-oriented programming and the evolution of Object oriented programming
CO2: Identify basic concepts of OOP, benefits and its applications.
CO3: Write object oriented programs using classes and objects.
CO4: Design object oriented programs that can focus on reusability – Inheritance.
CO5: Utilize runtime polymorphism with pointers and virtual functions and File concepts.

SYLLABUS

UNIT- I : **(18 Hrs)**

Principles Object-Oriented Programming **:** Object-Oriented Programming Paradigm – Basic Concepts of Object-Oriented Programming – Benefits of OOP – Object-Oriented Languages –Applications of OOP.Classes and Objects**:** Introduction – C Structures Revisited – Specifying a Class – Defining Member Functions – A C++ Program with Class – Making an Outside Function Inline – Nesting of Member Functions – Private Member Functions – Arrays within a Class – Memory Allocation for Objects – Static Data Members – Static Member Functions – Arrays of Objects – Objects as Function Arguments – Friendly Functions - Returning Objects – Functions. Const Member Functions – Pointers to Members – Local Classes.

UNIT- II : **(18 Hrs)**

Constructors and Destructors: Introduction – Constructors – Parameterized Constructors – Multiple Constructors in a Class – Constructors with Default Arguments – Dynamic Initialization of Objects – Copy Constructor – Dynamic Constructors – Constructing Two-Dimensional Arrays – const Objects – Destructors.

UNIT- III : **(18 Hrs)**

Function Overloading. Operator Overloading and Type Conversions: Introduction – Defining Operator Overloading – Overloading Unary Operators - Overloading Binary Operators - Overloading Binary Operators Using Friends – Manipulation of Strings Using Operators – Operator Overloading – Rules for Overloading Operators. Type Conversions.

UNIT- IV : **(18 Hrs)**

Inheritance: Extending Classes: Introduction – Defining Derived Classes – Single Inheritance – Making a Private Member Inheritable – Multilevel Inheritance – Multiple Inheritance – Hierarchical Inheritance – Hybrid Inheritance – Virtual Base Classes – Abstract Classes – Constructors in Derived Classes – Member Classes: Nesting of Classes. Pointers, Virtual functions and Polymorphism: Introduction – Pointers – Pointers to Objects – this Pointer – Pointers to Derived Classes – Virtual Functions – Pure Virtual Functions – Virtual Constructors and Destructors.

UNIT- V : **(18 Hrs)**

Managing Console I/O operations : Introduction – C++ Streams – C++ Stream Classes – Unformatted I/O operations – Formatted Console I/O operations. Working with files : Introduction – Classes for file stream operations – Opening and Closing a File – Detecting End-of-File – More about Open(): File Modes – File Pointers and their Manipulations – Sequential Input and Output Operations.

TEXT BOOK:

Object Oriented Programming with C++, E.Balagurusamy, McGraw Hill Education (India) Pvt. Ltd., New Delhi, 6th Edition, 2015.
Chapters: 1 (1.4 – 1.8), 5, 6, 4(4.10),7, 8, 9, 10(10.1-10.5),11(11.1-11.7).

REFERENCE BOOKS:

1. ***Programming with C++***, Ravichandran, 3rd Edition, TMH Publication, 2017.
2. ***The Complete Reference – C++***, Herbert Schildt, 4th Edition, Tata McGraw-Hill Publication, 2017.
3. ***A Tour of C++,*** Bjarne Stroustrup, 2nd edition, Addison-Wesley Publication, 2018

NEW

I B.Sc. Computer Science

5%

SEMESTER –II

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
UACS	19B2CC3	PROGRAMMING IN C++	MAJOR	6	4

COURSE DESCRIPTION

This course facilitates the students with the comparative knowledge of structured oriented programming and object oriented programming paradigm. It also provides the object oriented programming features which supports modular programming.

COURSE OBJECTIVES

- To introduce Object Oriented Programming concepts using C++ and improve their OOP Skill.
- To Introduce the object oriented programming features – Encapsulation, Polymorphism and Inheritance.
- To develop programs for data file access using C++ streams.

SYLLABUS

UNIT I : PRINCIPLES OF OOP (18 Hrs)

Principles of Object-Oriented Programming **:**Object-Oriented Programming Paradigm – Basic Concepts of Object-Oriented Programming – Benefits of OOP – Object-Oriented Languages –Applications of OOP. Classes and Objects**:** Introduction – C Structures Revisited – Specifying a Class – Defining Member Functions – A C++ Program with Class – Making an Outside Function Inline – Nesting of Member Functions – Private Member Functions – Arrays within a Class – Memory Allocation for Objects – Static Data Members – Static Member Functions – Arrays of Objects – Objects as Function Arguments – Friendly Functions - Returning Objects – Functions. Const Member Functions – Pointers to Members – Local Classes.

UNIT II : CONSTRUCTORS AND DESTRUCTORS (18 Hrs)

Constructors and Destructors: Introduction – Constructors – Parameterized Constructors – Multiple Constructors in a Class – Constructors with Default Arguments – Dynamic Initialization of Objects – Copy Constructor –

Dynamic Constructors – Constructing Two-Dimensional Arrays – const Objects – Destructors.

UNIT III : OVERLOADING **(18 Hrs)**

Function Overloading. Operator Overloading and Type Conversions: Introduction – Defining Operator Overloading – Overloading Unary Operators - Overloading Binary Operators - Overloading Binary Operators Using Friends – Manipulation of Strings Using Operators – Operator Overloading – Rules for Overloading Operators. Type Conversions.

UNIT IV : INHERITANCE **(18 Hrs)**

Inheritance: Extending Classes: Introduction – Defining Derived Classes – Single Inheritance – Making a Private Member Inheritable – Multilevel Inheritance – Multiple Inheritance – Hierarchical Inheritance – Hybrid Inheritance – Virtual Base Classes – Abstract Classes – Constructors in Derived Classes – Member Classes: Nesting of Classes.

Pointers, Virtual functions and Polymorphism: Introduction – Pointers – Pointers to Objects – this Pointer – Pointers to Derived Classes – Virtual Functions – Pure Virtual Functions – Virtual Constructors and Destructors.

UNIT V : I/O OPERATIONS **(18 Hrs)**

Managing Console I/O operations : Introduction – C++ Streams – C++ Stream Classes – Unformatted I/O operations – Formatted Console I/O operations. Working with files : Introduction – Classes for file stream operations – Opening and Closing a File – Detecting End-of-File – More about Open(): File Modes – File Pointers and their Manipulations – Sequential Input and Output Operations.

Self Study : DYNAMISM :(For CIA Only)

Const Member Functions – Pointers to Members – Local Classes.

Multiple Constructors in a Class – Constructors with Default Arguments

Overloading Binary Operators Using Friends

Constructors in Derived Classes – Member Classes: Nesting of Classes

Unformatted I/O operations – Formatted Console I/O operations

TEXT BOOK

Object Oriented Programming with C++, E.Balagurusamy, McGraw Hill Education (India) Pvt. Ltd., New Delhi, 6th Edition, 2015.

Chapters: 1 (1.4 – 1.8), 5, 6, 4(4.10),7, 8, 9, 10(10.1-10.5),11(11.1-11.7).

REFERENCE BOOKS

1. ***Programming with C++***, Ravichandran, 3rd Edition, TMH Publication, 2017.

2. The Complete Reference – C++, Herbert Schildt, 4th Edition, Tata McGraw-Hill Publication, 2017.

3. A Tour of C++, Bjarne Stroustrup, 2nd edition, Addison-Wesley Publication, 2018

OLD

2019 - 2020
II B.Sc. Computer Science -III SEMESTER
MAJOR CORE
B3CC5 - DATA STRUCTURES AND ALGORITHMS

HRS/WEEK : 6 **CREDITS : 4**

COURSE OUTCOMES

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

CO1 : Identify data structures needed to solve specific problems
CO2 : Analyse the data structures for effective use in problem solving
CO3 : Design and develop efficient algorithms in terms of Space and Time
CO4: Troubleshoot algorithms
CO5 : Analyse time complexity of algorithms

SYLLABUS

UNIT I : Basic Concepts **(18 Hrs)**

Overview: System Life Cycle – Object Oriented Design – Data Abstraction and Encapsulation – Basics of C++ - Algorithm Specification – Performance Analysis and Measurement.

UNIT II: Arrays & Stacks and Queues **(18 Hrs)**

Abstract Data Types and the C++ Class – The array as an Abstract Data Type – The Polynomial Abstract Data Type – Sparse Matrices – Representation of Arrays – The String Abstract Data Type - Templates in C++ - The Stack Abstract Data Type – The Queue Abstract Data Type – Subtyping and Inheritance in C++ - A Mazing problem – Evaluation of Expressions.

UNIT III: Linked Lists **(18 Hrs)**

Singly linked lists and chains– Representing Chains in C++ - The Template class chain - Circular lists – Available Space lists - Linked stacks and queues – Polynomials – Equivalence classes – Sparse matrices.

UNIT IV: Trees **(18 Hrs)**

Introduction - Binary trees – Binary tree traversal and Tree Iterators – Additional binary tree operations – Threaded binary trees.

UNIT V: Algorithm **(18 Hrs)**

Divide and Conquer: The general method - Binary search
Greedy method: The general method – Knapsack problem
Dynamic Programming: The general method - Multi-stage graphs.

TEXT BOOKS:

1. ***Fundamentals of Data Structures in C++,*** Ellis Horowitz, Sartaj Sahni, Dinesh Mehta, 2nd Edition, Universities Press, 2008.
   Chapter: 1, 2, 3, 4.1 - 4.9, 5.1 - 5.5
2. ***Computer Algorithms/C++,*** Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran, 1st Edition, Galgotia Publications, 2008.
   Chapter: 3.1, 3.2, 4.1, 4.2, 5.1, 5.2

REFERENCE BOOKS:

1. ***Fundamentals of Data Structures in C++,*** Ellis Horowitz, Sartaj Sahni, Galgotia Publications, 2006.
2. ***Fundamentals of Computer Algorithms***, Ellis Horowitz, Sartaj Sahni, Galgotia Publications, 2010.
3. ***Data structures with C***, Seymour Lipschutz., Tata McGraw Hill, New Delhi, 2011.

NEW

II B.Sc. Computer Science

5%

SEMESTER –III

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
UACS	19B3CC5	Data Structures And Algorithms	MAJOR CORE	6	4

COURSE DESCRIPTION

This course aims to impart fundamental knowledge on application of data structures in problem solving and about predefined algorithms

COURSE OBJECTIVES

- To impart knowledge and skill on identifying apt data structures to solve problems efficiently.
- To impart skill to write time and space efficient algorithms.
- To provide basic knowledge about predefined algorithms and where they could be applied.

SYLLABUS

UNIT I : BASIC CONCEPTS & ARRAYS [18 HRS]

Overview: System Life Cycle – Object Oriented Design – Data Abstraction and Encapsulation - Algorithm Specification – Performance Analysis and Measurement - - Abstract Data Types and the C++ Class – The array as an Abstract Data Type – The Polynomial Abstract Data Type – Sparse Matrices – Representation of Arrays – The String Abstract Data Type

UNIT II: STACKS AND QUEUES [18 HRS]

Templates in C++ - The Stack Abstract Data Type – The Queue Abstract Data Type – Subtyping and Inheritance in C++ - A Mazing problem – Evaluation of Expressions.

UNIT III: LINKED LISTS **[18 HRS]**

Singly linked lists and chains– Representing Chains in C++ - The Template class chain - Circular lists – Available Space lists - Linked stacks and queues – Polynomials – Equivalence classes – Sparse matrices.

UNIT IV: TREES **[18 HRS]**

Introduction - Binary trees – Binary tree traversal and Tree Iterators – Additional binary tree operations – Threaded binary trees

UNIT V: ALGORITHM **[18 HRS]**

Divide and Conquer: The general method - Binary search
Greedy method: The general method – Knapsack problem
Dynamic Programming: The general method - Multi-stage graphs.
SELF STUDY: DYNAMISM :(For CIA Only)
UNIT III: Available Space lists - Polynomials –Sparse matrices.

TEXT BOOKS

1. ***Fundamentals of Data Structures in C++,*** Ellis Horowitz, SartajSahni, Dinesh Mehta, 2nd Edition, Universities Press, 2016. Chapter: 1, 2, 3, 4.1 - 4.9, 5.1 - 5.5
2. ***Computer Algorithms/C++,*** Ellis Horowitz, SartajSahni, SanguthevarRajasekaran, 1st Edition, Galgotia Publications, 2016. Chapter: 3.1, 3.2, 4.1, 4.2, 5.1, 5.2

REFERENCE BOOKS

1. ***Fundamentals of Data Structures in C++,*** Ellis Horowitz, SartajSahni, Galgotia Publications, 2006.
2. ***Fundamentals of Computer Algorithms***, Ellis Horowitz, SartajSahni, Galgotia Publications, 2010.
3. ***Data structures with C***, Seymour Lipschutz., Tata McGraw Hill, New Delhi, 2011.

2019 - 2020 OLD

II B.Sc. Computer Science - IV SEMESTER

MAJOR CORE

B4CC7 – RELATIONAL DATABASE SYSTEM CONCEPTS

HRS/WEEK : 6 **CREDITS : 4**

COURSE OUTCOMES

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

CO1: Explain basic architecture, major components behind relational databases, various set operations and their implementation in RDBMS and key advantages of using RDBMS in real world computing.
CO2: Assess how SQL evolves as the communication language to access the data.
CO3: Discuss functional dependencies and various forms of normalization in maintaining the integrity of data.
CO4: Prepare E-R diagram which represents the data their relationship.
CO5: Demonstrate implementation of the relational operators in SQL, Boolean and Arithmetic operators, Pattern matching techniques and Utilize group, date and time functions to handle complex queries. queries.

SYLLABUS

UNIT- I: **(18 Hrs)**

An Overview of DBMS and DB Systems Architecture - Introduction to database management systems – data models – database system architecture .

An Introduction to SQL and Relational Database Concepts : The SQL Language- Relational Database Management Systems – Candidate Key and Primary Key of Relation – Foreign Keys – Relational Operators –Attribute Domains and their Implementations.

UNIT- II: **(18 Hrs)**

Functional Dependencies: Introduction – Definition of Functional Dependencies – Functional Dependencies and Keys – Inference Axioms for Functional Dependencies – Redundant Functional Dependencies – Closures, Cover and Equivalence of Functional Dependencies.

Normalization Process: Introduction – First Normal Form – Data Anomalies in 1NF Relations – Partial Dependencies – Second Normal Form – Data Anomalies in 2NF Relations – Transitive Dependencies – Third Normal Form – Data anomalies in 3NF Relations – Boyce-Codd Normal Form – Lossless or Lossy Decompositions – Preserving Functional Dependencies.

UNIT- III: **(18 Hrs)**

The Entity-Relationship Model : The Entity-Relationship Model – Entities and Attributes – Relationships – One-to-One Relationships – Many-to-One and Many-to-Many Relationships – Normalizing the Model – Table Instance Charts.

Name conventions for Database objects – Structure of SQL statements and SQL writing Guidelines – Interacting with the Oracle RDBMS through SQL*Plus – Creating tables – Describing the structure of the Table – Populating Tables - Implementation of the Relational Operators in SQL – Implementation of the Selection Operator – Using Aliases to control Column Headings – Implementation of the Projection Operator – Implementation of the Join Operator – Creating Foreign Keys – Defining Primary Keys in an Existing Table – Using CHECK Constraints to restrict a Column's Input Values – Adding Columns to an Existing Table – Modifying Columns of an Existing Table – Removing Constraints from a Table.

UNIT- IV: **(18 Hrs)**

Boolean Operators and Pattern Matching – Boolean Operators and Pattern Matching Compound Clauses – Pattern Matching – the like statement and wildcard characters – Matching values in a List or a Range of values

Arithmetic Operations and Built-in Functions – Arithmetic Operations – Built-in functions – Built-in Functions – Individual Numeric – Built-in – Character – Important Conversion Functions

UNIT- V: **(18 Hrs)**

Group Functions – Introduction to Group Functions – The SUM(n) and AVG(n) Functions – The max(n) and min(n) functions – The count Functions – Combining Single-Value and Group Functions – Displaying Specific Groups.

Processing Date and Time Information – Introduction to Processing Date and Time- Arithmetic With Dates – Date Functions- Formatting Dates and Times

TEXT BOOK

Database Management Systems, Ramon A. Mata-Toledo and Pauline K. Cushman, Schaum's Outline Series, Tata Mc-Graw Hill Publications, Second reprint 2008.
Chapters: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

REFERENCE BOOKS

1. ***Oracle Database 11g The Complete Reference,*** Kevin Loney, Oracle Press, MGH, 2008.
2. ***Database system Concepts***, Abraham silberschatz, Henry F.Korth, S.Sudharshan, MGH, 6th Edition, 2013.
3. ***Fundamentals of Database System,*** Ramez Elmasri, Shamkant B. Navathe, Pearson Education Publications, 6th Edition, 2017.

NEW

II B.Sc. Computer Science

5%

SEMESTER –IV

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
UACS	19B4CC7	RELATIONAL DATABASE SYSTEM CONCEPTS	MAJORE CORE	6	4

COURSE DESCRIPTION

This course helps the students to understand the need for database management systems, their architecture, data models and a detailed explanation of database schema. This course also facilitates the students to acquire the skill of using SQL as a tool to access database entities.

COURSE OBJECTIVES

- To impart complete understanding of Relational database concepts and its usage in the real world applications
- To encapsulate the implementation of database system concepts in SQL

SYLLABUS

UNIT I: INTRODUCTION (18 Hrs)

An Overview of DBMS and DB Systems Architecture - Introduction to database management systems – data models – database system architecture .

An Introduction to SQL and Relational Database Concepts : The SQL Language- Relational Database Management Systems – Candidate Key and Primary Key of Relation – Foreign Keys – Relational Operators –Attribute Domains and their Implementations.

UNIT II: NORMALIZATION PROCESS (18 Hrs)

Functional Dependencies: Introduction – Definition of Functional Dependencies – Functional Dependencies and Keys – Inference Axioms for Functional Dependencies – Redundant Functional Dependencies – Closures, Cover and Equivalence of Functional Dependencies.

Normalization Process: Introduction – First Normal Form – Data Anomalies in 1NF Relations – Partial Dependencies – Second Normal Form – Data Anomalies in 2NF Relations – Transitive Dependencies – Third Normal Form – Data anomalies in 3NF Relations – Boyce-Codd Normal Form – Lossless or Lossy Decompositions – Preserving Functional Dependencies.

UNIT III: ENTITY-RELATIONSHIP MODEL (18 Hrs)

The Entity-Relationship Model : The Entity-Relationship Model – Entities and Attributes – Relationships – One-to-One Relationships – Many-to-One and Many-to-Many Relationships – Normalizing the Model – Table Instance Charts.

Name conventions for Database objects – Structure of SQL statements and SQL writing Guidelines – Interacting with the Oracle RDBMS through SQL*Plus – Creating tables – Describing the structure of the Table – Populating Tables - Implementation of the Relational Operators in SQL – Implementation of the Selection Operator – Using Aliases to control Column Headings – Implementation of the Projection Operator – Implementation of the Join Operator – Creating Foreign Keys – Defining Primary Keys in an Existing Table – Using CHECK Constraints to restrict a Column's Input Values – Adding Columns to an Existing Table – Modifying Columns of an Existing Table – Removing Constraints from a Table.

UNIT IV: BOOLEAN AND ARITHMETIC OPERATIONS (18 Hrs)

Boolean Operators and Pattern Matching – Boolean Operators and Pattern Matching Compound Clauses – Pattern Matching – the like statement and wildcard characters – Matching values in a List or a Range of values

Arithmetic Operations and Built-in Functions – Arithmetic Operations – Built-in functions – Built-in Functions – Individual Numeric – Built-in – Character – Important Conversion Functions

UNIT V: FUNCTIONS (18 Hrs)

Group Functions – Introduction to Group Functions – The SUM(n) and AVG(n) Functions – The max(n) and min(n) functions – The count Functions – Combining Single-Value and Group Functions – Displaying Specific Groups.

Processing Date and Time Information – Introduction to Processing Date and Time- Arithmetic With Dates – Date Functions- Formatting Dates and Times

SELF – STUDY : DYNAMISM :(For CIA Only)

UNITIV: Arithmetic Operations and Built-in Functions – Arithmetic Operations – Built-in functions – Built-in Functions – Individual Numeric – Built-in – Character – Important Conversion Functions

UNITV: Processing Date and Time Information – Introduction to Processing Date and Time- Arithmetic With Dates – Date Functions- Formatting Dates and Times

TEXT BOOK

Database Management Systems, Ramon A. Mata-Toledo and Pauline K. Cushman, Schaum's Outline Series, Tata Mc-Graw Hill Publications, Second reprint 2008.

Chapters: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

REFERENCE BOOKS

1. ***Oracle Database 11g The Complete Reference,*** Kevin Loney, Oracle Press, MGH, 2008.

2. ***Database system Concepts***, Abraham silberschatz, Henry F.Korth, S.Sudharshan, MGH, 6th Edition, 2013.

3. Fundamentals of Database System, RamezElmasri, Shamkant B. Navathe, Pearson Education Publications, 6th Edition, 2017.

2019- 2020

III B.Sc. Computer Science - V SEMESTER

OLD

MAJOR CORE

B5CC9 - PROGRAMMING IN JAVA

HRS/WEEK : 5 **CREDITS : 5**

COURSE OUTCOMES

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

CO1: Explain the fundamental concepts of object-oriented programming and acquire programming skills using the basic language constructs and the core APIs provided by Java.

CO2: Design, write, compile, execute, test, and debug object-oriented programs in Java.

CO3: Develop well-documented and structured event handling programs using Applet

CO4: Identify the use of Java in a variety of technologies and on different platforms.

CO5: Implement GUI based client applications and TCP/ IP and UDP based Network programs

SYLLABUS

UNIT I : **(15 Hrs)**

The History and Evolution Java- An Overview of Java - Data types, Variables and Arrays - Operators - Control Statements - Introducing Classes - A Closer look at Methods and Classes.

UNIT II: **(15 Hrs)**

Inheritance - Packages and Interfaces – Exception Handling.

UNIT III: **(15 Hrs)**

Multithread Programming: The Java Thread Model – The Main Thread – Creating a Thread - Creating Multiple Threads – Using isAlive( ) and join( ) – Thread Priorities. String Handling: The String Constructors – String Length – Special String Operations – Character Extraction – String Comparison – Searching Strings – Modifying a String – Data Conversion Using valueOf( ) – Changing the Case of Characters Within a String – Joining Strings. Input/ Output: Exploring java.io: The I/O Classes and Interfaces – File – The AutoClosable, Closeable, and Flushable Interfaces – I/O Exceptions - Two ways to Close a Stream – The Stream Classes - The Byte Streams – Input, Output, FileInput, FileOutput Stream - The Character Streams – Reader, Writer, FileReader, FileWriter – Serialization – Networking.

UNIT IV : **(15 Hrs)**

The Applet Class: Two types of Applets - Applet Basics- Applet Architecture – An Applet Skeleton – Simple Applet Display Methods – Requesting Repainting – Using the Status Window – The HTML APPLET Tag – Passing Parameters to Applets – getDocumentBase() and getCodeBase() – AppletContext and showDocument() – The AudioClip Interface – The AppletStub Interface – Outputting to the Console. Event Handling: Two Event Handling Mechanisms – The Delegation Event Model – Event Classes – The KeyEvent Class - Sources of Events – Event Listener Interfaces – Using the Delegation Event Model – Adapter Classes – Inner Classes.

UNIT V: **(15 Hrs)**

Introducing the AWT: Working with Windows, Graphics and Text : AWT classes – Window Fundamentals – Working with Frame Windows – Creating a Frame Window in an AWT-Based Applet – Creating a Windowed Program – Displaying Information Within a Window – Introducing Graphics – Working with Color – Setting the Paint Mode – Working with Fonts – Managing Text Output Using FontMetrics. Using AWT Controls, Layout Managers, and Menus: AWT Control Fundamentals – Labels – Using Buttons – Applying Check Boxes – CheckboxGroup – Choice Controls – Using Lists – Managing Scroll Bars – Using a TextField – Using a TextArea – Understanding Layout Managers – Menu Bars and Menus – Dialog Boxes – FileDialog – A Word About Overriding paint( ).

TEXT BOOK

1. ***JAVA The Complete Reference,*** Herbert Schildt**,** 9th Edition, Tata McGraw-Hill Publication, 2016. Chapters **:** 1 – 7, 8 - 11, 16, 20, 22 - 26.

REFERENCE BOOKS

1. ***Programming with JAVA,*** Dr.C.Muthu, Vijay Nicole Imprints Private Limited, 2nd Edition, 2009.
2. ***Thinking in Java,*** Harry and Chris James, 2nd Edition, 2009.
3. ***Java in a Nutshell,*** David Flnagan, O'Reilly Media Inc., 5th Edition, 2014.
4. ***Programming with Java,*** E. Balagurusamy, McGraw-Hill, 5th Edition, 2017.

NEW

III B.Sc. Computer Science

SEMESTER –V

5%

For those who joined in 2018 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
UACS	B5CC9	PROGRAMMING IN JAVA	Major core	5	5

COURSE DESCRIPTION

This Java Programming course provides extensive programming experience with Java and its object-oriented features.

COURSE OBJECTIVES

- To introduces platform independent, Object Oriented Programs destined for distribution on the internet.
- To implement refinements and improvements in the art of programming.
- To introduce and understand the usage of Applet in implementing dynamic web pages by embedding in HTML.
- To explore advanced Java concepts and to develop user friendly GUI based web Applications

SYLLABUS

UNIT I : INTRODUCTION (15 Hrs)

The History and Evolution Java- An Overview of Java - Data types, Variables and Arrays - Operators - Control Statements - Introducing Classes - A Closer look at Methods and Classes.

UNIT II: INHERITANCE AND PACKAGES (15 Hrs)

Inheritance - Packages and Interfaces – Exception Handling.

UNIT III: MULTITHREAD AND IO STREAMS (15 Hrs)

Multithread Programming: The Java Thread Model – The Main Thread – Creating a Thread - Creating Multiple Threads – Using isAlive( ) and join( ) – Thread Priorities. String Handling: The String Constructors – String Length – Special String Operations – Character Extraction – String Comparison – Searching Strings – Modifying a String – Data Conversion Using valueOf( ) –

Changing the Case of Characters Within a String – Joining Strings. Input/ Output: Exploring java.io: The I/O Classes and Interfaces – File – The AutoClosable, Closeable, and Flushable Interfaces – I/O Exceptions - Two ways to Close a Stream – The Stream Classes - The Byte Streams – Input, Output, FileInput, FileOutput Stream - The Character Streams – Reader, Writer, FileReader, FileWriter – Serialization – Networking.

UNIT IV : APPLET **(15 Hrs)**

The Applet Class: Two types of Applets - Applet Basics- Applet Architecture – An Applet Skeleton – Simple Applet Display Methods – Requesting Repainting – Using the Status Window – The HTML APPLET Tag – Passing Parameters to Applets – getDocumentBase() and getCodeBase() – AppletContext and showDocument() – The AudioClip Interface – The AppletStub Interface – Outputting to the Console. Event Handling: Two Event Handling Mechanisms – The Delegation Event Model – Event Classes – The KeyEvent Class - Sources of Events – Event Listener Interfaces – Using the Delegation Event Model – Adapter Classes – Inner Classes.

UNIT V: ABSTRACT WINDOWING TOOLKIT **(15 Hrs)**

Introducing the AWT: Working with Windows, Graphics and Text : AWT classes – Window Fundamentals – Working with Frame Windows – Creating a Frame Window in an AWT-Based Applet – Creating a Windowed Program – Displaying Information Within a Window – Introducing Graphics – Working with Color – Setting the Paint Mode – Working with Fonts – Managing Text Output Using FontMetrics. Using AWT Controls, Layout Managers, and Menus: AWT Control Fundamentals – Labels – Using Buttons – Applying Check Boxes – CheckboxGroup – Choice Controls – Using Lists – Managing Scroll Bars – Using a TextField – Using a TextArea – Understanding Layout Managers – Menu Bars and Menus – Dialog Boxes – FileDialog – A Word About Overriding paint( ).

SELF – STUDY : DYNAMISM :(For CIA Only)

Inheritance -Creating Multiple Threads – Using isAlive( ) and join( ) – Thread Priorities. The AutoClosable, Closeable, and Flushable Interfaces – I/O Exceptions - Two ways to Close a Stream – The Stream Classes - The Byte Streams – Input, Output, FileInput, FileOutput Stream - The Character Streams – Reader, Writer, FileReader, FileWriter – Serialization – Networking - Passing Parameters to Applets – getDocumentBase() and getCodeBase() – AppletContext and showDocument() – The AudioClip Interface – The AppletStub Interface – Outputting to the Console.

TEXT BOOK

1. ***JAVA The Complete Reference,*** Herbert Schildt**,** 9th Edition, Tata McGraw-Hill Publication, 2016.
   Chapters **:** 1 – 11, 16, 20, 22 - 26.

REFERENCE BOOKS

1. ***Programming with JAVA,*** Dr.C.Muthu, Vijay Nicole Imprints Private Limited, 2nd Edition, 2009.
2. ***Thinking in Java,*** Harry and Chris James, 2nd Edition, 2009.
3. ***Java in a Nutshell,*** David Flnagan, O'Reilly Media Inc., 5th Edition, 2014.

Programming with Java, E. Balagurusamy, McGraw-Hill, 5th Edition, 2017.

OLD

2019 - 2020
III B.Sc. COMPUTER SCIENCE -V SEMESTER
MAJOR CORE
B5CC10 - OPERATING SYSTEM CONCEPTS

HRS/WEEK : 5 **CREDITS : 5**

COURSE OUTCOMES

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

CO1: Explain what operating systems are, what they do and how they are designed and constructed.
CO2: Describe the services an operating system provides to users, processes and other systems
CO3: Outline the process concept and assess the methods for process scheduling, Inter-process communication and deadlock handling.
CO4: Assess the management of various resources – Process, Memory, Information and Devices and the effective utilization.
CO5: Describe the various security threats and attacks and the countermeasures to them.

SYLLABUS

UNIT I : **[15 HRS]**

Introduction: What Operating Systems Do – Operating-System Structure - Operating-System Operations – Distributed Systems – Special-Purpose Systems – Computing Environments – Open-Source Operating-Systems. System Structures: Operating-System Services – User Operating-System Interface – System Calls – Types of System Calls – System Programs - Operating-System Design and Implementation.

UNIT II : **[15 HRS]**

Process Concept: Process Concept – Process Scheduling – Operations on Processes – Interprocess Communication. Process Scheduling: Basic Concepts – Scheduling Criteria – Scheduling Algorithms. Deadlocks: System Model – Deadlock Characterization – Methods for Handling Deadlocks – Deadlock Prevention.

UNIT III : **[15 HRS]**

Memory-Management Strategies: Background – Swapping – Contiguous Memory Allocation – Paging – Structure of the Page Table – Segmentation.

UNIT IV : **[15 HRS]**

File System: File Concept – Access Methods – Directory and Disk Structure. Implementing File Systems: File-System Structure – File-System Implementation.

UNIT V : **[15 HRS]**

Secondary-Storage Structure: Overview of Mass-Storage Structure – Disk Structure – Disk Attachment – Disk Scheduling – Disk Management. System Security: The Security Problem – Program Threats – System and Network Threats.

TEXT BOOK

Operating System Concepts, Abraham Silberschatz, Peter B.Galvin, Greg Gagne, John Wiley & Sons, Inc. 8th Edition, Reprint, 2014.
Chapters: 1(1.1, 1.4, 1.5, 1.10 – 1.13), 2(2.1 – 2.6), 3(3.1 – 3.4), 5(5.1 – 5.3), 7(7.1 – 7.4), 8(8.1 – 8.6), 10(10.1 – 10.3), 11(11.1 – 11.2), 12(12.1 – 12.5), 15(15.1 – 15.3)

REFERENCE BOOKS

1. ***Operating Systems,*** Harvey M.Deitel, Paul J.Deitel, David R.Choffines, Pearson Prentice Hall, 3rd Edition, 2007.
2. ***Operating Systems – A Concept-Based Approach,*** Dhananjay M.Dhamdhere, MGH, 3rd Edition, 2017.
3. ***Operating Systems : Internals and Design Principles,*** William Stallings, 9th edition, 2018.

NEW

III B.Sc. Computer Science

SEMESTER –V

5%

For those who joined in 2018 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
UACS	B5CC10	**Operating System Concepts**	Major core	5	5

COURSE DESCRIPTION

This course helps the students to understand the role of operating system as a resource manager, its architecture, types. Also this paper facilitates the students to understand vulnerabilities and the various techniques to protect them.

COURSE OBJECTIVE/S

- To develop critical thinking, inquiring, technology skills to describe and to paraphrase what operating systems are, what they do and how they are designed & construct.
- To identify, infer and summarize the resource management utility.
- To develop collaborative and soft skills to compare the structure & basic organization of different operating system.
- To provide understanding skills to identify the vulnerabilities and to combat them

SYLLABUS

UNIT I : INTRODUCTION **[15 HRS]**

Introduction: What Operating Systems Do – Operating-System Structure - Operating-System Operations –Distributed Systems – Special-Purpose Systems – Computing Environments – Open-Source Operating-Systems. System Structures: Operating-System Services – User Operating-System Interface – System Calls – Types of System Calls – System Programs - Operating-System Design and Implementation.

UNIT II : PROCESS CONCEPT **[15 HRS]**

Process Concept:Process Concept – Process Scheduling – Operations on Processes – Interprocess Communication. Process Scheduling: Basic Concepts – Scheduling Criteria – Scheduling Algorithms. Deadlocks: System

Model – Deadlock Characterization – Methods for Handling Deadlocks – Deadlock Prevention.

UNIT III : MEMORY MANAGEMENT STRATEGIES [15 HRS]

Memory-Management Strategies: Background – Swapping – Contiguous Memory Allocation – Paging – Structure of the Page Table – Segmentation.

UNIT IV : FILE SYSTEM [15 HRS]

File System: File Concept – Access Methods – Directory and Disk Structure. Implementing File Systems: File-System Structure – File-System Implementation.

UNIT V : SECONDARY STORAGE STRUCTURE [15 HRS]

Secondary-Storage Structure: Overview of Mass-Storage Structure – Disk Structure – Disk Attachment – Disk Scheduling – Disk Management. System Security: The Security Problem – Program Threats – System and Network Threats.

SELF – STUDY : DYNAMISM :(For CIA Only)

System Calls – Types of System Calls – Segmentation - The Security Problem – Program Threats – System and Network Threats.

TEXT BOOK

Operating System Concepts, Abraham Silberschatz, Peter B.Galvin, Greg Gagne, John Wiley & Sons, Inc.8th Edition, Reprint, 2014.

Chapters: 1(1.1, 1.4, 1.5, 1.10 – 1.13), 2(2.1 – 2.6), 3(3.1 – 3.4), 5(5.1 – 5.3), 7(7.1 – 7.4), 8(8.1 – 8.6), 10(10.1 – 10.3), 11(11.1 – 11.2), 12(12.1 – 12.5), 15(15.1 – 15.3)

REFERENCE BOOKS

1. ***Operating Systems,*** Harvey M.Deitel, Paul J.Deitel, David R.Choffines, Pearson Prentice Hall, 3rd Edition, 2007.
2. ***Operating Systems – A Concept-Based Approach,*** DhananjayM.Dhamdhere, MGH, 3rd Edition, 2017.
3. ***Operating Systems : Internals and Design Principles,*** William Stallings, 9th edition, 2018.

OLD

2019 - 2020
III B.Sc. Computer Science - VI SEMESTER
MAJOR CORE
B6CC13 - J2EE PROGRAMMING

HRS/WEEK: 5 **CREDITS : 5**

COURSE OUTCOMES

On the successful completion of the course, students will be able to
CO1: Explain J2EE Architecture and Standard Services used
CO2: Create Remote methods and apply it in J2EE applications using RMI
CO3: Develop Server side Java Applications using Servlet and JSP
CO4: Design programs with Data Base Connectivity using JDBC
CO5: Identify the type of Java Messaging Service

SYLLABUS

UNIT I: Understanding Java and the J2EE Platform (15 Hrs)

Reviewing a brief history of Java – Understanding J2SE – Examining the Origin of (J2EE) – Working with the model-View Controller –Understanding J2EEAPIs – Discovering What's New in J2EE 1.4, Introducing Application Servers: - Implementing the J2EE Platform – Understanding the features of an Application Server - Examining Full J2EE Implementations – Examining partial J2EE Implementations.

UNIT II: Understanding RMI and Servlet Programming (15 Hrs)

Providing an Overview of RMI – developing Applications with RMI – Pushing data from the RMI Server – RMI over Inter-ORB Protocol (IIOP). Creating a magazine Publisher Application Using Servlets – Using Servlet Context – Performing URl ReDirection – Examining the web.xml Deployment Descriptor.

UNIT III: JSP (15 Hrs)

Introducing JSP – Examining MVC and JSP - JSP Scripting Elements and Directives –Working with Variable Scopes – Error pages – Using java Beans – Designing an online Store with JSP – Simple programs using JSP. Using JSP Tag Extensions– Why use Tag Extensions- Explaining custom tag concepts – Explaining taglib mapping – Understanding Tag Handlers – Exploring Dynamic Attributes.

UNIT IV: JDBC (15 Hrs)

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

UNIT V : JMS (15 Hrs)

Explaining Messaging – Introducing JMS – Examining Messaging Models – Understanding the major JMS Components – Configuring JMS- Explaining Reliable Messaging.

TEXT BOOK

J2EE 1.4 Bible, James McGovern, Rahim Adatia and others, 1st Edition, Wiley India (P) Ltd, Reprint 2008.
Chapters: 1, 3 - 7, 9, 18

REFERENCE BOOKS

1. ***The J2EE Tutorial***, Stephanie Bodoff, Eric Armstrong and others, Pearson Education, 2nd Edition, 2004.
2. ***J2EE : The Complete Reference***, Jim Keogh, Tata McGraw-Hill Publishing Company Limited , New Delhi, 1st Edition, 18th Reprint 2008.

NEW

III B.Sc. Computer Science

5%

SEMESTER –VI

For those who joined in 2018 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
UACS	B6CC13	J2EE Programming	Major Core	5	5

COURSE DESCRIPTION

J2ee Programming course provides programming experience with Advanced Java Concepts like RMI, Servlet, JDBC, JSP and JMS

COURSE OBJECTIVES

- To Understand J2EE as an architecture and platform for building and deploying web-based, n-tier enterprise applications
- To Understand the concept of Servlet and JSP as dynamic content generation technologies (Web-Server & support Technologies)
- To Understand RMI as Distributed-Objects Technology
- To Understand the use of Java Messaging Service
- To Acquire knowledge on how various J2EE technologies are used together to build enterprise applications

SYLLABUS

UNIT I: JAVA AND THE J2EE PLATFORM (15 Hrs)

Reviewing a brief history of Java – Understanding J2SE – Examining the Origin of (J2EE) – Working with the model-View Controller –Understanding J2EEAPIs – Discovering What's New in J2EE 1.4, Introducing Application Servers: - Implementing the J2EE Platform – Understanding the features of an Application Server - Examining Full J2EE Implementations – Examining partial J2EE Implementations.

UNIT II: RMI AND SERVLET PROGRAMMING (15 Hrs)

Providing an Overview of RMI – developing Applications with RMI – Pushing data from the RMI Server – RMI over Inter-ORB Protocol (IIOP). Creating a magazine Publisher Application Using Servlets – Using Servlet Context – Performing URlReDirection – Examining the web.xml Deployment Descriptor.

UNIT III: JSP (15 Hrs)

Introducing JSP – Examining MVC and JSP - JSP Scripting Elements and Directives –Working with Variable Scopes – Error pages – Using java Beans – Designing an online Store with JSP – Simple programs using JSP. Using

JSP Tag Extensions– Why use Tag Extensions- Explaining custom tag concepts – Explaining taglib mapping – Understanding Tag Handlers – Exploring Dynamic Attributes.

UNIT IV: JDBC **(15 Hrs)**

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

UNIT V : JMS **(15 Hrs)**

Explaining Messaging – Introducing JMS – Examining Messaging Models – Understanding the major JMS Components – Configuring JMS- Explaining Reliable Messaging.

SELF STUDY : DYNAMISM :(For CIA Only)

Introducing Application Servers: - Implementing the J2EE Platform – Understanding the features of an Application Server - Examining Full J2EE Implementations – Examining partial J2EE Implementations

TEXT BOOK

J2EE 1.4 Bible, James McGovern, Rahim Adatia and others, 1st Edition, Wiley India (P) Ltd, Reprint 2008. Chapters: 1, 3 - 7, 9, 18

REFERENCE BOOKS

1. ***The J2EE Tutorial***, Stephanie Bodoff, Eric Armstrong and others, Pearson Education, 2nd Edition, 2004.
2. ***J2EE : The Complete Reference***, Jim Keogh, Tata McGraw-Hill Publishing Company Limited , New Delhi, 1st Edition, 18th Reprint 2008.

2019 - 2020
III B.Sc. Computer Science - VI SEMESTER
MAJOR CORE
B6CC14 - DATA COMMUNICATIONS AND NETWORKING

OLD

HRS/WEEK: 5 **CREDITS: 5**

COURSE OUTCOMES

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

CO1: Explain the structure of internet according to OSI model
CO2: Analyse the capacity, efficiency and the usage of different transmission medium
CO3: Outline the different switching techniques used for data transmission
CO4: Explain the various error and flow control algorithms used for effective communication
CO5: Outline the various addressing used for communication between source and destination through internet
CO6: Compare the format of data transmission using TCP and UDP protocols
CO7: Explain the standard algorithms used for data security

SYLLABUS

UNIT I: Introduction **(15 Hrs)**

Data Communications – Networks – The Internet – Protocols and Standards – Layered Tasks - The OSI Model - Layers in the OSI Model – TCP/IP Protocol Suite – Addressing – Key Terms.

UNIT II: Transmission Media **(12 Hrs)**

Guided Media – Unguided Media: Wireless – Circuit-Switched Networks – Datagram Networks – Virtual- Circuit Networks – Structure of a Switch.

UNIT III: Data Link Layer **(15 Hrs)**

Introduction – Block Coding - Linear Block Codes – Cyclic Codes – Checksum - Framing - Flow and Error Control – Protocols – Noiseless Channels – Noisy Channels.

UNIT IV: Network & Transport Layer **(15 Hrs)**

IPv4 Addresses – IPv6 Addresses –Process-To-Process Delivery - User Datagram Protocol (UDP) - Transmission Control Protocol(TCP).

UNIT V: Network Security **(18 Hrs)**

Cryptography: Introduction – Symmetric-key Cryptography - Asymmetric-key Cryptography – Security Services – Message Confidentiality – Message Integrity – Message Authentication – Digital Signature – Entity Authentication.

TEXT BOOK

Data Communications and Networking, ***Behrouz A. Forouzhan***, Tata McGraw-Hill Publishing Company Limited, New Delhi, 4th Edition, 2015.
Chapters: 1, 2, 7, 8, 10, 11.1 – 11.5, 19, 23.1 – 23.3, 30, 31

REFERENCE BOOKS

1. ***Computer Networks***, ***Andrew S. Tanenbaum***, 3rd Edition, Prentice-Hall India Ltd, New Delhi, 2003.
2. ***Data and Computer Communication***, ***William E. Stallings***,7th Edition, Prentice-Hall India Ltd, New Delhi, 2007.
3. ***Data Communications and Networking***, ***Behrouz A. Forouzhan***, Tata McGraw-Hill Publishing Company Limited, New Delhi, 5th Edition, 2012.

NEW

III B.Sc. Computer Science

SEMESTER –VI

5%

For those who joined in 2018 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
UACS	B6CC14	Data Communications and Networking	Major Core	5	5

COURSE DESCRIPTION

This course aims to impart knowledge about the basics and the structure of data communicating systems and the various algorithms and protocols used to accomplish data transmission through internet.

COURSE OBJECTIVE/S

- To understand the basics of data communicating systems.
- To provide knowledge about the concepts of internet.
- To learn the various protocols used in the internet

SYLLABUS

UNIT I: INTRODUCTION (15 Hrs)

Data Communications – Networks – The Internet – Protocols and Standards – Layered Tasks - The OSI Model - Layers in the OSI Model – TCP/IP Protocol Suite – Addressing – Key Terms.

UNIT II: TRANSMISSION MEDIA (15 Hrs)

Guided Media – Unguided Media: Wireless – Circuit-Switched Networks – Datagram Networks – Virtual-Circuit Networks – Structure of a Switch.

UNIT III: DATA LINK LAYER (15 Hrs)

Introduction – Block Coding - Linear Block Codes – Cyclic Codes – Checksum - Framing - Flow and Error Control – Protocols – Noiseless Channels – Noisy Channels.

UNIT IV: NETWORK & TRANSPORT LAYER (15 Hrs)

IPv4 Addresses – IPv6 Addresses –Process-To-Process Delivery - User Datagram Protocol (UDP) - Transmission Control Protocol(TCP).

UNIT V: NETWORK SECURITY (15 Hrs)

Cryptography: Introduction – Symmetric-key Cryptography - Asymmetric-key Cryptography – Security Services – Message Confidentiality – Message Integrity – Message Authentication – Digital Signature – Entity Authentication.

SELF STUDY : DYNAMISM :(For CIA Only)

Unit I : Network Categories

Unit II : Unguided Media

Unit IV : IPV6 Addresses

Unit V : Digital Signature

TEXT BOOK

Data Communications and Networking, ***Behrouz A. Forouzhan***, Tata McGraw-Hill Publishing Company Limited, New Delhi, 4th Edition, 2015.

Chapters:1, 2, 7, 8, 10, 11.1 – 11.5, 19, 23.1 – 23.3, 30, 31

REFERENCE BOOKS

1. ***Computer Networks***, ***Andrew S. Tanenbaum***, 3rd Edition, Prentice-Hall India Ltd, New Delhi, 2003.
2. ***Data and Computer Communication***, ***William E. Stallings***,7th Edition, Prentice-Hall India Ltd, New Delhi, 2007.
3. ***Data Communications and Networking***, ***Behrouz A. Forouzhan***, Tata McGraw-Hill Publishing Company Limited, New Delhi, 5th Edition, 2012.

OLD

2019 - 2020
I B.Sc. Computer Science -II SEMESTER
ALLIED CORE
19B2AC2 - COMPUTER SYSTEM ARCHITECTURE

HRS/WEEK : 5 **CREDITS : 5**

COURSE OUTCOMES

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

CO1: Outline the structure of a basic computer system and explain the role of functional units
CO2: Explain the instruction cycle according to the type and addressing mode of the instruction
CO3: Design the control logic circuit for various digital circuits such as registers, memory and adder - logic circuit of a basic computer system
CO4: Identify the memory requirement of a CPU, select the memory chips and design a mapping circuit
CO5: Explain the structure and the usage of various interfacing devices needed for connecting peripheral devices with the CPU

SYLLABUS

UNIT- I: Basic Computer Organization and Design (15 Hrs)

Instruction Codes – Computer Registers – Computer Instructions – Timing and Control – Instruction Cycle – Memory-Reference Instructions – Input-Output and Interrupt - Complete Computer Description – Design of Basic Computer – Design of Accumulator Logic.

UNIT- II: Central Processing Unit (15 Hrs)

Introduction – General Register Organization – Stack Organization – Instruction Formats - Addressing Modes – Data Transfer and Manipulation – Program Control

UNIT-III: Computer Arithmetic (15 Hrs)

Introduction – Addition and Subtraction - Multiplication Algorithms – Division Algorithms – Floating-point Arithmetic Operations

UNIT- IV Input-Output Organization (15 Hrs)

Peripheral Devices – Input-Output Interfaces – Asynchronous Data Transfer – Modes of Transfer – priority Interrupt - Direct Memory Access (DMA)

UNIT -V: Memory Organization (15 Hrs)

Memory Hierarchy – Main Memory – Auxiliary memory – Associative Memory – Cache Memory – Virtual Memory – Memory Management Hardware

TEXT BOOK

Computer System Architecture, M.Morris Mano, Revised 3rd Edition, Pearson Publication , New Delhi, 2017.
Chapters : 5, 8.1-8.7, 10.1-10.5, 11.1 – 11.6, 12

REFERENCE BOOKS

1. ***Computer Organization and Architecture,*** Rajaraman.V and Radhakrishnan, 1st Edition, Prentice Hall of India Private Limited, 2009
2. ***Computer Organization and Architecture*** – Designing for Performance, William Stallings, 5th Edition, Pearson Edition, 2010
3. ***Computer Organisation, V.Carl Hamacher, Zvonko G***. Uranesic. & Safwat Zaky, 5th Edition, 2011

NEW

I B.Sc. Computer Science

SEMESTER –II

5%

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
UACS	19B2AC2	Computer System Architecture	ALLIED CORE	5	5

COURSE DESCRIPTION

This course aims to impart knowledge about internal architecture of a computer system and the techniques used to connect various input/output system with the computer.

COURSE OBJECTIVES

- To understand the organization and design of basic digital computer.
- To understand the procedure for implementing the arithmetic algorithm in digital hardware.
- To discuss the techniques that computers use to communicate with I/O devices and Memory.

SYLLABUS

UNIT I: BASIC COMPUTER ORGANIZATION AND DESIGN (15 Hrs)

Instruction Codes – Computer Registers – Computer Instructions – Timing and Control – Instruction Cycle – Memory-Reference Instructions – Input-Output and Interrupt - Complete Computer Description – Design of Basic Computer – Design of Accumulator Logic.

UNIT II: CENTRAL PROCESSING UNIT (15 Hrs)

Introduction – General Register Organization – Stack Organization – Instruction Formats - Addressing Modes – Data Transfer and Manipulation – Program Control

UNIT III: COMPUTER ARITHMETIC (15 Hrs)

Introduction – Addition and Subtraction - Multiplication Algorithms – Division Algorithms – Floating-point Arithmetic Operations

UNIT IV: INPUT-OUTPUT ORGANIZATION
(15 Hrs)

Peripheral Devices – Input-Output Interfaces – Asynchronous Data Transfer – Modes of Transfer – priority Interrupt - Direct Memory Access (DMA)

UNIT V: MEMORY ORGANIZATION (15 Hrs)

Memory Hierarchy – Main Memory – Auxiliary memory – Associative Memory – Cache Memory – Virtual Memory – Memory Management Hardware

Self Study: DYNAMISM :(For CIA Only)

Unit-I: Complete Flow Chart of a basic computer system

Unit-II: Data Transfer and Manipulation Instructions

Unit-IV: Peripheral Devices

Unit-V: Auxiliary Memory

TEXT BOOK

Computer System Architecture, M.Morris Mano, Revised 3rdEdition, Pearson Publication , New Delhi, 2017. Chapters : 5, 8.1-8.7, 10.1-10.5, 11.1 – 11.6, 12

REFERENCE BOOKS

1. ***Computer Organization and Architecture,***Rajaraman.V and Radhakrishnan, 1st Edition,
Prentice Hall of India Private Limited, 2009
2. ***Computer Organization and Architecture*** – Designing for Performance, William Stallings,
5th Edition, Pearson Edition, 2010
3. ***Computer Organisation, V.CarlHamacher, Zvonko G.*** Uranesic.&SafwatZaky, 5thEdition, 2011

2019 - 2020 OLD

III B.Sc. Computer Science - V SEMESTER

MAJOR ELECTIVE

B5ME1 - SOFTWARE ENGINEERING

HRS/WEEK : 5 **CREDITS : 5**

COURSE OUTCOMES

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

CO1: Explain the basic concepts and techniques.
CO2: Plan for building efficient and reliable software.
CO3: Analyze the challenges of small to large scale software development.
CO4: Identify suitable model for various kind of projects.
CO5: Explain the concept of time management, managerial and technical skill required by human resources.

SYLLABUS

UNIT I : Introduction To Software Engineering And Planning A Software Project (15 Hrs)

Some Definitions – Some Size Factors – Quality and Productivity Factors – Managerial Issues. Defining the Problem – Developing a Solution Strategy – Planning the Development Process – Planning an Organizational Structure – Other Planning Activities.

UNIT II : Software Cost Estimation (15 Hrs)

Software Cost Factors – Software Cost Estimation Techniques – Staffing-Level Estimation – Estimating Software Maintenance Costs.

UNIT III : Software Requirements Definition (15 Hrs)

Software Requirements Definition: The Software Requirements Specification – Formal Specification Techniques.

UNIT IV : Software Design And Implementation (15 Hrs)

Fundamental Design Concepts – Modules and Modularization Criteria – Design Notations – Design Techniques – Detailed Design Considerations – Real-Time and Distributed System Design – Test Plans. Implementation Issues: Structured Coding Techniques – Coding Style.

UNIT V : Verification And Validation Techniques And Software Maintenance (15 Hrs)

Quality Assurance – Walkthroughs and Inspections – Static Analysis – Symbolic Execution – Unit Testing and Debugging – System Testing. Software Maintenance – Enhancing Maintainability During development – Managerial aspects of Software maintenance – Configuration management – Source-code metrics – Other maintenance tools and techniques

TEXT BOOK

1. ***Software Engineering,*** Richard Fairley, Tata Mc-Graw Hill Publication, Reprint 2012.
   Chapters: 1.1 - 1.4, 2.1 - 2.5, 3.1 - 3.4, 4.1 - 4.2, 5.1 - 5.7, 6.1 - 6.2, 8.1 - 8.6, 9.1 - 9.5

REFERENCE BOOKS

1. ***Software Engineering,*** Ian Somerville, 10th Edition, Pearson publications, 2016.
2. ***Software Engineering: A Practitioner's Approach,*** Roger S. Pressman, McGraw Hill publications, 2017.
3. ***Software Engineering,*** 7th Edition, Stephen R.Schach, Tata McGraw Hill Education Private Limited, 2017.

NEW

III B.Sc. Computer Science

SEMESTER –V

5%

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
UACS	B5ME1	Software Engineering	Major Elective	5	5

COURSE DESCRIPTION

This course covers the fundamentals of software engineering, including understanding and analyzing system requirements, finding appropriate engineering compromises. And also explains how to apply effective methods of design, coding and testing for software development.

COURSE OBJECTIVES

- To orient towards becoming best programmers
- To understand several SDLC models for software development that can be consistent to produce high quality software at low cost
- To obtain knowledge about the improvement in design specification and software testing

SYLLABUS

UNIT I : INTRODUCTION TO SOFTWARE ENGINEERING (15 Hrs)

Some Definitions – Some Size Factors – Quality and Productivity Factors – Managerial Issues. Defining the Problem – Developing a Solution Strategy – Planning the Development Process – Planning an Organizational Structure – Other Planning Activities.

UNIT II : SOFTWARE COST ESTIMATION (15 Hrs)

Software Cost Factors – Software Cost Estimation Techniques – Staffing-Level Estimation – Estimating Software Maintenance Costs.

UNIT III : SOFTWARE REQUIREMENTS DEFINITION (15 Hrs)

Software Requirements Definition: The Software Requirements Specification – Formal Specification Techniques.

UNIT IV : SOFTWARE DESIGN AND IMPLEMENTATION (15 Hrs)

Fundamental Design Concepts – Modules and Modularization Criteria – Design Notations – Design Techniques – Detailed Design Considerations – Real-Time and Distributed System Design – Test Plans. Implementation Issues: Structured Coding Techniques – Coding Style.

UNIT V: VERIFICATION AND VALIDATION TECHNIQUES &SOFTWARE MAINTENANCE (15 Hrs)

Quality Assurance – Walkthroughs and Inspections – Static Analysis – Symbolic Execution – Unit Testing and Debugging – System Testing. Software Maintenance – Enhancing Maintainability During development – Managerial aspects of Software maintenance – Configuration management – Source-code metrics – Other maintenance tools and techniques

SELF STUDY: DYNAMISM :(For CIA Only)

UNIT IV: Fundamental Design Concepts – Modules and Modularization Criteria – Design Notations – Design Techniques – Detailed Design Considerations

TEXT BOOK

1. ***Software Engineering,*** Richard Fairley, Tata Mc-Graw Hill Publication, Reprint 2012.

Chapters: 1.1 - 1.4, 2.1 - 2.5, 3.1 - 3.4,4.1 - 4.2, 5.1 - 5.7, 6.1 - 6.2, 8.1 - 8.6, 9.1 - 9.5

REFERENCES:

1. ***Software Engineering,*** Ian Somerville, 10th Edition, Pearson publications, 2016.
2. ***Software Engineering: A Practitioner's Approach,*** Roger S. Pressman, McGraw Hill publications, 2017.
3. ***Software Engineering,*** 7th Edition, Stephen R.Schach, Tata McGraw Hill Education Private Limited, 2017.

DOER:

https://www.javatpoint.com/software-engineering-tutorial

https://www.tutorialspoint.com/software_engineering/index.html

https://www.guru99.com/software-engineering-tutorial.html

OLD

2019 - 2020
III B.Sc. Computer Science - V SEMESTER
MAJOR ELECTIVE
B5ME2 – LATEST COMPUTING TECHNOLOGIES

HRS/WEEK : 5 **CREDITS: 5**

COURSE OUTCOMES

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

CO1: Explain the key technologies, architecture, strengths, limitations and applications of cloud computing
CO2: Describe soft computing techniques and their roles in building intelligent machines
CO3: Explain the genesis and applications of grid computing
CO4: Explain the approaches to green computing and its future
CO5: Describe wireless and mobile communications systems

SYLLABUS

UNIT I: Introduction to Cloud Computing (15 Hrs)

Overview of Distributed Computing: Trends of computing-Introduction to distributed computing-Next big thing: Cloud computing. Introduction to Cloud Computing*:* What's cloud computing - Properties & Characteristics - Service models - Deployment models – Introduction to Big Data.

UNIT II: Introduction to Soft Computing (15 Hrs)

Evolution of Computing – Soft Computing Constituents – From Conventional AI to Computational Intelligence – Machine Learning Basics.

UNIT III: Introduction to Grid Computing (15 Hrs)

What is grid Computing. Benefits of grid computing - Exploiting under utilized resources - Parallel CPU capacity - Virtual resources and virtual organizations for collaboration- Access to additional resources - Resource balancing - Reliability – Management. Grid terms and concepts - Grid user roles.

UNIT IV: Introduction to Green Computing (15 Hrs)

Introduction - Approaches to Green Computing -Future of Green Computing- Ways of Implementation - Green IT - Recent Implementations.

UNIT V: Introduction to Mobile Computing (15 Hrs)

Introduction to Mobile Communications and Computing: Mobile Computing (MC): Introduction to MC, novel applications, limitations, and architecture. GSM: Mobile services, System architecture, Radio interface, Protocols, Localization and calling, Handover, Security, and New data services. Wireless Medium Access Control: Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA.

TEXT BOOK

Course material will be prepared by the Department Staff.

REFERENCE BOOKS:

1. ***Mobile Computing***, Asoke K.Talukder, Tata Mcgraw hill publishing, 2005.
2. ***Grid Computing (Making the Global infrastructure a reality),*** Fran Besman, Wiley India, 2012.
3. ***Mobile Computing***, M.Sundara Rajan, Sams Publishers, 2012.
4. ***Grid Computing for developers***, Silva, Vladimir, Dreamtech Press India, 2012.
5. ***Cloud Computing in easy steps***, Crookes, David-McGraw Hill Edu, 2012.
6. ***Cloud Computing (A practical approach),*** Velte, Anthony.T,Tata Mcgraw hill Publishing comp, 2013.
7. ***Cloud Computing: Principles and paradigms***, Bayya, Rajkumar, Wiley India, 2013.
8. ***Mobile Computing***, Patra, Prashanta kumar, Scitech Publication, 2nd Edition, 2013.

NEW

III B.Sc. Computer Science

5%

SEMESTER –V

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
UACS	B5ME2	Python Programming	Major Elective	5	5

COURSE DESCRIPTION

Python is an interpreted, high-level, general-purpose programming language. it provides constructs that enable clear programming on both small and large scales.

COURSE OBJECTIVES

OBJECTIVES :

- To understand why python is a useful scripting language for developers.
- To learn how to design and program python applications.
- To learn how to use lists, tuples, and dictionaries in python programs

UNITS

UNIT I: BASIC OF PYTHON PROGRAMMING (15 HRS)

Features of Python-History of Python-The Future of Python-Writing and Executing First Python Program-Literal Constants-Variables and Identifiers-Data Types- Input Operation-Comments-Reserved Words-Indentation- Operation and Expressions-Expression in Python –Operations on Strings-Other Data Types-Type Conversion.

UNIT II: DECISION CONTROL STATEMENTS (15 HRS)

Introduction to Decision Control Statements-Selection /Conditional Branching Statements-Basic Loop Structure /Iterative Statements-Nested Loops-The Break Statement-The Continue Statement-The Pass Statement-The Else Statement used with Loops. Functions and Modules: Introduction – Function Declaration and Definition-Function Call-Variables Scope and Lifetime-The Return Statement-More On Defining Function-Lambda Functions or Anonymous Functions-Documentation Strings.

UNIT III: PYTHON STRINGS REVISITED (15 HRS)

Concatenating ,Appending ,and Multiplying Strings-String Formatting Operator-Build in String Methods and Functions-Slice Operation-Ord()and Chr() Function-Comparing String-Iteration String –The String Module-Regular Expressions-Metacharacters in Regular Expression. File Handling: File Path-Types of Files-Opening and Closing Files-Reading and Writing Files-File Positions-Renaming and Deleting Files-Directory Methods.

UNIT IV: DATA STRUCTURES (15 HRS)

Sequence-Lists-Functional Programming-Tuple-Sets-Dictionaries Classes and Objects:Classes and Objects-Class Methods and Self Arguments,Constructer-Class Variables and Object Variables-Other Special Methods-Public and Private Data Members-Private Methods-Built in Function-Built in Class Attributes-Garbage Collection-Class Methods-Static Methods

UNIT V: INHERITANCE (15 HRS)

Inheriting Classes in Python-Types of Inheritance-Composition-Abstract Classes and Interfaces-Metaclass. Operator overloading: Introduction-Implementing Operator Overloading-Reverse Adding-Overriding –Getitem-(),Setitem-(),Methods-Overriding the in Operator-Overloading Miscellaneous Function-Overriding the –Call-() Method. Error and Exception Handling: Introduction to Errors and Exceptions-Handling Exceptions-Multiple Except Blocks-Multiple Exceptions in A Single Block-Except Block without Exception –The else Clause- Raising Exception-Instantiating Exceptions-Handling Exception in Invoked Functions.

DYNAMISM :(For CIA Only) (

UNIT II: DECISION CONTROL STATEMENTS

Introduction to Decision Control Statements-Selection /Conditional Branching Statements-Basic Loop Structure /Iterative Statements-Nested Loops-The Break Statement-The Continue Statement-The Pass Statement-The Else Statement used with Loops.

TEXT BOOK:

1. ***Python Programming using Problem Solving Approach,*** ReemaThareja,Published By Oxford Higher Education, 2017.

REFERENCES:

1. ***Problem Solving and Python Programming,*** S.A. Kulkarni, Published By Yesdee,2017
2. ***Python for Software Design How to Think Like a computer scientist****,* Allen B.Downey Cambridge University Press,2018
3. ***Introduction to Programming using Python*** **,**Y.DanielLiang,Published By Pearson,2018.

2019 - 2020

OLD

III B.Sc. Computer Science - V SEMESTER

MAJOR ELECTIVE

B5ME3 - DATA MINING AND DATA WAREHOUSING

HRS/WEEK : 5 **CREDITS : 5**

COURSE OUTCOMES

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

CO1: Explain the data extraction and transformation techniques.

CO2. List the association rule mining techniques and understand association mining to correlation analysis, constraint based association mining.

CO3. Describe operational database, warehousing and multidimensional need of data base to meet industrial needs.

CO4. Explain the components of warehousing, classification methods and clustering analysis.

CO5. Identify and discuss the Business analysis, query tools and application, OLAP etc

SYLLABUS

UNIT I : Data Preprocessing **(15 Hrs)**

Language- Architectures- Concept Description: PreprocessingCleaning- Integration- Transformation- Reduction- Discretization- Concept Hierarchy Generation- Data Mining Primitives- Query Language- Graphical User InterfacesArchitectures- Concept Description- Data Generalization- Characterizations- Class Comparisons- Descriptive Statistical Measures.

UNIT II : **Association Rule** **(15 Hrs)**

Association Rule Mining- Single-Dimensional Boolean Association Rules from Transactional Databases- Multi-Level Association Rules from Transaction Databasesmining multidimensional Association rules –association mining to correlation analysisconstraint based association mining.

UNIT III: **Classification and Prediction** **(15 Hrs)**

Classification and Prediction- Issues- Decision Tree InductionBayesian Classification- Association Rule Based- Other Classification Methods- PredictionClassifier Accuracy.

UNIT IV: Cluster Analysis **(15 Hrs)**

Cluster Analysis- Types of data- Categorization of methods- Partitioning methods- hierarchical methods- density based methods- grid based methods - Outlier Analysis. Recent trends - Multidimensional Analysis and Descriptive Mining of Complex Data Objects- Spatial Databases- Multimedia Databases- Time Series and Sequence DataText Databases- World Wide Web- Applications and Trends in Data Mining

UNIT V : **Data Warehousing** **(15 Hrs)**

Data Warehousing: Introduction- Data Warehouse- Multidimensional Data Model- Data Warehouse Architecture- Implementation - Data Warehousing to Data Mining -Data warehousing components-building a data warehouse – mapping the data warehouse to an architecture - data extraction - cleanup- transformation tools- metadata – OLAP - Patterns and models - Data visualization principles.

TEXT BOOKS

1. ***Data Mining: Concepts and Techniques***, Jiawei Han and Micheline Kamber, Harcourt India Morgan Kauffman- 2001.
2. ***Data Warehousing- Data mining and OLAP***, Alex Berson and Stephen J. Smith, Tata McGraw-Hill- 2004.

REFERENCE BOOKS

1. ***Data Mining: Introductory and Advanced Topics***, Margaret H. Dunham, Pearson Education- 2004.
2. ***Data Warehousing in the Real World***, Sam Anahory and Dennis Murry, Pearson Education- 2003

NEW

III B.Sc. Computer Science

5%

SEMESTER –V

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
UACS	B5ME3	Data Mining and Data Warehousing	Major Elective	5	5

COURSE DESCRIPTION

Data Mining and Data Warehousing course contains fundamental concepts of Data Mining and data pre-processing,Classification and Clustering algorithms and Data Warehousing concepts.

COURSE OBJECTIVES

- To understand the data pre-processing concepts
- To learn about Association Rule Mining, Mining Frequent Patterns and Classification.
- To understand Cluster Analysis
- To learn about data warehouse

SYLLABUS

UNIT I: INTRODUCTION
(15 Hrs)

Introduction to Data Mining - its importance — Data Mining on what kind of Data- Data Mining Functionalities-What Kinds of Patterns Can Be Mined – Are All of the Patterns Interesting – Classification of Data Mining Systems – Data Mining Task Primitives.

UNIT II: DATA PREPROCESSING AND DATA WAREHOUSING
(15 Hrs)

Need to Pre-process the Data - Descriptive Data Summarization – Data Cleaning – Data Integration and Transformation – Data Reduction. Data Warehouse and OLAP Technology : An Overview - What is a Data Warehouse – A Multidimensional Data Model – Data Warehouse Architecture.

UNIT III: MINING FREQUENT PATTERNS
(15 Hrs)

Basic Concepts and Road Map - Efficient and Scalable Frequent Itemset Mining Methods: The Apriori Algorithm : Finding Frequent Itemsets Using Candidate Generation- Generating Association Rules from Frequent Itemsets- Improving the Efficiency of Apriori – Mining Frequent Itemsets without Candidate Generation- Mining Frequent Itemsets Using Vertical Data Format – Mining Closed Frequent Itemsets.

UNIT IV : CLASSIFICATION (15 Hrs)

Classification - Prediction – Issues Regarding Classification and Prediction – Classification by Decision Tree Induction – Bayesian Classification – Rule-Based Classification.

UNIT V: CLUSTER ANALYSIS (15 Hrs)

What is Cluster Analysis – Types of Data in Cluster Analysis – A Categorization of Major Clustering Methods – Partitioning Methods – Hierarchical Methods.

SELF STUDY: DYNAMISM :(For CIA Only)

UNIT II: Data Integration and Transformation – Data Reduction. Data Warehouse and OLAP Technology

UNIT IV: Issues Regarding Classification and Prediction

TEXT BOOK :

Data Mining Concepts and Techniques, Jiawei Han and Micheline Kamber, 2nd Edition, Morgan Kaufmann Publishers An Imprint of Elsevier, 2009.

Chapters: 1.1 -1.7, 2.1- 2.5, 3.1- 3.3, 5.1-5.2, 6.1 - 6.5, 7.1 – 7.5

REFERENCE BOOKS :

1. ***Data Mining & Data Warehousing***, Udit Agarwal, 1st Edition, S.K.Kataria& sons
Publication, 2016.
2. ***Data Warehousing: Concepts, Techniques, Products and Applications***, 3rd Edition, PHI
Learning, Delhi, 2012.
3. ***Data Mining: Concepts and Techniques***, Jiawei Han, Micheline Kamber, 3rd Edition,
Morgan Kauffmann Publishers, 2011.
4. Data Mining Techniques and Applications: An Introduction, Hongbo DLL, Cengage
Lmg Business Press, 2010.

Digital Open Educational Resources (DOER)

1. https://www.tutorialspoint.com/data_mining/index.htm
2. https://data-flair.training/blogs/data-mining-tutorial/
3. https://www.youtube.com/watch?v=PT_D0mgFr-o

2019 – 2020

OLD

III B.Sc. Physics - V SEMESTER

ELECTIVE OFFERED TO PHYSICS

P5MEB1 – PROGRAMMING WITH C

HRS / WEEK: 5 **CREDITS: 5**

COURSE OUTCOMES

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

CO1: Explain the Fundamentals of C programming language.
CO2: Write Programs using Control Statements and Loop Structures.
CO3: Describe the concept of Array and String Functions.
CO4: Explain the concepts of structure and File.
CO5: Demonstrate the concept of pointers and solve the problem using pointers

SYLLABUS

UNIT I : **(15 Hrs)**

Introduction to C Programming**:** The C character set – Identifiers and keywords - Data types – Constants – Variables and Arrays Declaration – Expressions – Statements – Symbolic Constants. Operators and Expressions**:** Arithmetic operators – Unary operators - Relational and logical operators – Assignment operators – The conditional operators – Library functions.

UNIT II : **(15 Hrs)**

Data Input and Output*:* Preliminaries – Single character Input – The getchar function – Single character output – The putchar function – Entering Input data – The scanf function – more about the scanf function – The gets and puts function - interactive (Conversational) programming. Control Statements: Preliminaries. Branching if-else statement – Looping: The While Statement – More Looping the Do-While statement – Still more looping: the For statement- Nested Control Structures - The Switch statement- the Break statement – Continue statement - The comma operator – the Goto statement.

UNIT III: **(15 Hrs)**

Functions *:*A brief Overview – Defining a function – Accessing a function – Function prototypes - passing Arguments to a Function

UNIT IV: **(15 Hrs)**

Arrays*:* Defining an array – Processing an Array – Passing arrays to Functions - Multidimensional Arrays.
Pointers: Fundamentals – Pointer Declarations – operations on pointers.

UNIT V: **(15 Hrs)**

Structures: Defining a structure – Processing a structure. Data Files*:* Why files **-** Opening and closing a data file – Reading and writing a data file - Processing a data file.

TEXT BOOK

Programming with C, Byron S Gottfried & Jitender Kumar Chhabra, 3rd Edition, Tata McGraw Hill Education Pvt. Ltd., New Delhi, 2014.
Chapters: 2 - 4, 6, 7.1 – 7.5, 9, 11.1 - 11.2, 11.6, 12.1 - 12.2, 13.1 -13.4

REFERENCE BOOKS

1. ***Programming in ANSI C***, E. Balagurusamy, 2nd Edition, Tata McGrawHill Publishing company Ltd, New Delhi, 2004.
2. ***Let Us C***, Yashwant P. Kanetkar, 8th Edition, BPB Publications, New Delhi, 2007.
3. ***C Programming Language***, B. W. Kernighan & D. M. Ritchie, Prantice Hall Publications, 2nd Edition, 2011.

NEW

III B.Sc. Computer Science

5%

SEMESTER –V

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
UACS	P5MEB1	Programming With C	Major Elective – Offered To Physics	5	5

COURSE DESCRIPTION

This course helps to provide the fundamental knowledge of a programming language and its features which enhances the user to write general purpose application programs.

COURSE OBJECTIVES

- To introduce and form a firm foundation in programming
- To stress the importance of clarity , simplicity and the efficiency in writing programs

UNITS

UNIT I : INTRODUCTION (15 Hrs)

Introduction to C Programming**:** The C character set – Identifiers and keywords - Data types – Constants – Variables and Arrays Declaration – Expressions – Statements – Symbolic Constants. Operators and Expressions**:** Arithmetic operators – Unary operators - Relational and logical operators – Assignment operators – The conditional operators – Library functions.

UNIT II : DATA INPUT AND OUTPUT (13 Hrs)

Data Input and Output:Preliminaries – Single character Input – The getchar function – Single character output – The putchar function – Entering Input data – The scanf function – more about the scanf function – The gets and puts function - interactive (Conversational) programming. Control Statements: Preliminaries. Branching if-else statement – Looping: The While Statement – More Looping the Do-While statement – Still more looping: the For statement- Nested Control Structures - The Switch statement- the Break statement – Continue statement - The comma operator – the Goto statement.

UNIT III: FUNCTIONS **(13 Hrs)**

Functions :A brief Overview – Defining a function – Accessing a function – Function prototypes - passing Arguments to a Function

UNIT IV: ARRAYS **(13 Hrs)**

Arrays:Defining an array – Processing an Array – Passing arrays to Functions - Multidimensional Arrays.*Pointers:* Fundamentals – Pointer Declarations – operations on pointers.

UNIT V: STRUCTURES **(13 Hrs)**

Structures:Defining a structure – Processing a structure. Data Files:Why files - Opening and closing a data file – Reading and writing a data file - Processing a data file.

UNIT VI DYNAMISM (For CIA Only) :(8 Hrs)
Unit I: Library functions
Unit II: more about the scanf function - more about the printf() function - the Break statement – Continue statement - The comma operator – the Goto statement

TEXT BOOK
Programming with C, Byron S Gottfried &Jitender Kumar Chhabra, 3rd Edition, Tata McGraw Hill Education Pvt. Ltd., New Delhi, 2014.

Chapters: 2 - 4, 6, 7.1 – 7.5, 9, 11.1 - 11.2, 11.6, 12.1 - 12.2, 13.1 -13.4

REFERENCES:

1. ***Programming in ANSI C***, E. Balagurusamy, 2nd Edition, Tata McGrawHill Publishing company Ltd, New Delhi, 2004.
2. ***Let Us C***, Yashwant P. Kanetkar, 8th Edition, BPB Publications, New Delhi, 2007.
3. ***C Programming Language***, B. W. Kernighan & D. M. Ritchie, Prantice Hall Publications, 2nd Edition, 2011.

DIGITAL OPEN EDUCATIONAL RESOURCES (DOER)

https://www.toptal.com/c/the-ultimate-list-of-resources-to-learn-c-and-c-plus-plus

OLD

2019 - 2020
III B.Sc. Computer Science - VI SEMESTER
MAJOR ELECTIVE
B6ME4 - COMPUTER GRAPHICS

HRS/WEEK : 5 **CREDITS : 5**

COURSE OUTCOMES

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

CO1: Identify the basic concepts used in computer graphics.
CO2: Analyze different output primitives.
CO3: Explain the techniques of transformations and three dimensional graphics with display methods.
CO4: Discuss the importance of viewing and clipping.
CO5: Explain the fundamentals of animation and virtual reality

SYLLABUS

UNIT I: A Survey Of Computer Graphics & Attributes Of Output Primitives (15 Hrs)

Computer-Aided Design – Presentation Graphics – Computer Art – Entertainment – Education and Training – Visualization – Image Processing – Graphical User Interfaces – Line Attributes – Curve Attributes – Color and Grayscale Levels – Area Fill Attributes – Character Attributes - Bundled Attributes – Inquiry Functions – Anti-aliasing.

UNIT II : Output Primitives (15 Hrs)

Points and Lines – Line-Drawing Algorithms – Loading the Frame Buffer – Line Function – Circle-Generating Algorithms – Ellipse-Generating Algorithms – Pixel Addressing and Object Geometry - Filled-Area Primitives – Fill-Area Functions – Cell Array – Character Generation.

UNIT III : Two-Dimensional Geometric Transformations & Three Dimensional Concepts (15 Hrs)

Basic Transformations – Matrix Representations – Composite Transformations - Other Transformations - Transformations between Coordinate Systems – Affine Transformations – Transformation Functions – Raster Methods for Transformations – Three-Dimensional Concepts – Three-Dimensional Display Methods – Three-Dimensional Graphics.

UNIT IV : Two-Dimensional Viewing (15 Hrs)

The Viewing Pipeline – Viewing Coordinate Reference Frame – Window-to-View port Coordinate Transformation – Two Dimensional viewing Functions - Clipping Operations – Point Clipping – Line Clipping – Cohen-Sutherland Line Clipping – Polygon Clipping – Sutherland-Hodgeman Polygon Clipping - Curve Clipping – Text Clipping – Exterior Clipping.

UNIT V: Visible–Surface Detection Methods & Computer Animation (15 Hrs)

Classification of Visible–Surface Detection Algorithms – Back–Face Detection – Depth Buffer Method – A- Buffer Method – Scan–Line Method – Design of Animation Sequences – General Computer–Animation Functions Raster Animations – Computer Animation languages – Key Frame Systems – Motion Specifications.

TEXT BOOK

Computer Graphics C Version, Donald Hearn & M. Pauline Baker, 2nd Edition, Pearson India Education Services Private Limited, 2016.
Chapters : 1, 3.1 – 3.6, 3.10 - 3.14, 4, 5, 6, 9, 13.1-13.5, 16

REFERENCE BOOKS

1. ***Interactive Computer Graphics: A top-down approach with OpenGL***, Edward Angel and Dave Shreiner, 6th Edition, Addison Wesley, 2012.
2. ***Computer Graphics Principles and Practice***, Foley, Van Dam, Feiner, Hughes, 3rd Edition, C. Addison Wesley, 2014.

NEW

III B.Sc. Computer Science

5%

SEMESTER –VI

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
UACS	B6ME4	Computer Graphics	Major Elective	5	5

COURSE DESCRIPTION

To provide comprehensive introduction about computer graphics system, design algorithms and two dimensional transformations.

COURSE OBJECTIVE/S

- To learn the basic principles of 2-dimensional computer graphics and the elementary mathematics techniques
- To focus on rendering of complex models by accurately drawing illustrations of complex objects with arbitrary camera and light sources.

UNITS

UNIT I: A Survey Of Computer Graphics & Attributes Of Output Primitives (15 Hrs)

Computer-Aided Design – Presentation Graphics – Computer Art – Entertainment – Education and Training – Visualization – Image Processing – Graphical User Interfaces – Line Attributes – Curve Attributes – Color and Grayscale Levels – Area Fill Attributes – Character Attributes - Bundled Attributes – Inquiry Functions – Anti-aliasing.

UNIT II : Output Primitives (15 Hrs)

Points and Lines – Line-Drawing Algorithms – Loading the Frame Buffer – Line Function – Circle-Generating Algorithms – Ellipse-Generating Algorithms – Pixel Addressing and Object Geometry - Filled-Area Primitives – Fill-Area Functions – Cell Array – Character Generation.

UNIT III :2D Geometric Transformations &3D Concepts (15 Hrs)

Basic Transformations – Matrix Representations – Composite Transformations - Other Transformations - Transformations between Coordinate Systems – Affine Transformations – Transformation Functions –

Raster Methods for Transformations – Three-Dimensional Concepts – Three-Dimensional Display Methods – Three-Dimensional Graphics.

UNIT IV : Two-Dimensional Viewing (15 Hrs)

The Viewing Pipeline – Viewing Coordinate Reference Frame – Window-to-View port Coordinate Transformation – Two Dimensional viewing Functions - Clipping Operations – Point Clipping – Line Clipping – Cohen-Sutherland Line Clipping – Polygon Clipping – Sutherland-Hodgeman Polygon Clipping - Curve Clipping – Text Clipping – Exterior Clipping.

UNIT V: Visible–Surface Detection Methods &Animation (15 Hrs)

Classification of Visible–Surface Detection Algorithms – Back–Face Detection – Depth Buffer Method – A- Buffer Method – Scan–Line Method – Design of Animation Sequences – General Computer–Animation Functions Raster Animations – Computer Animation languages – Key Frame Systems – Motion Specifications.

DYNAMISM: For CIA Only

UNIT I: Computer-Aided Design – Presentation Graphics – Computer Art – Entertainment – Education and Training – Visualization – Image Processing – Graphical User Interfaces

TEXT BOOK

Computer Graphics C Version, Donald Hearn & M. Pauline Baker, 2nd Edition, Pearson India Education

Services Private Limited, 2016.

Chapters : 1, 3.1 – 3.6, 3.10 - 3.14, 4, 5, 6, 9, 13.1-13.5, 16

REFERENCE BOOKS

1. ***Interactive Computer Graphics: A top-down approach with OpenGL***, Edward Angel and Dave Shreiner, 6th Edition, Addison Wesley, 2012.
2. ***Computer Graphics Principles and Practice***, Foley, Van Dam, Feiner, Hughes, 3rd Edition, C. Addison Wesley, 2014.

OLD

2019 – 2020
III B.Sc. Computer Science - VI SEMESTER
MAJOR ELECTIVE
B6ME5– SOFTWARE TESTING

HRS/WEEK: 5 **CREDITS : 5**

COURSE OUTCOMES

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

CO1: Explain various testing processes and continuous quality improvement
CO2: Describe White box testing and Black box testing
CO3: Discuss integration testing and its types
CO4: Explain Performance and Regression testing
CO5: Discuss Internationalization Testing and Ad-hoc testing procedures

SYLLABUS

UNIT- I : **(15 Hrs)**

*Principles of Testing***:** Context of Testing in Producing Software – About this Chapter – The Complete Car – Dijkstra's Doctrine – A test In Time! – The Cast and Saint – Test the Tests First! – The Pesticide Paradox – The Convoy and the Rags – The Policemen on the Bridge- The Ends of the Pendulum – Men in Black – Automation Syndrome. *Software Development Life Cycle Models***:** Phases of Software Project – Quality, Quality Assurance and Quality Control - Testing, Verification, and Validation – Process Model to Represent Different Phases – Life Cycle models.

UNIT- II : **(15 Hrs)**

*White Box Testing***:** What is White Box Testing? – Static Testing – Structural Testing – Challenges in White Box Testing. *Black Box Testing***:** What is Black Box Testing?- Why Black Box Testing? – When to do Black Box Testing? - How to do Black Box Testing ? – Conclusion.

UNIT- III : **(15 Hrs)**

Integration Testing: What is Integration Testing? - Integration Testing as a Type of Testing – Integration Testing as a Phase of Testing – Scenario Testing – Defect Bash - Conclusion. *System and Acceptance Testing:* System Testing Overview – Why is System Testing Done? – Functional Versus Non- Functional Testing – Functional System Testing – Non Functional Testing -Acceptance testing – Summary of Testing Phases.

UNIT- IV : **(15 Hrs)**

*Performance Testing***:** Introduction – Factors Governing Performance testing – Methodology for Performance Testing- Tools for Performance Testing – Process for Performance Testing. *Regression Testing:* What is Regression Testing? – Types of Regression Testing – When to Regression Testing? – How to Regression Testing? – Best Practices in Regression Testing.

UNIT- V : **(15 Hrs)**

Internationalization ($I_{18}n$) Testing: Introduction – Primer on Internationalization – Test Phases for Internationalization Testing – Enabling testing – Locale Testing – Internationalization Validation – Fake Language Testing – Localization Testing - Tools used for Internationalization - Challenges and issues
Ad hoc Testing: Overview of Ad Hoc Testing – Buddy testing – Pair Testing – Exploratory testing – Iterative testing – Agile and Extreme testing –Defect Seeding – Conclusion.

TEXT BOOK

Software Testing Principles and Practices, Srinivasan Desikan, Gopalaswamy, Ramesh, 1st Edition, 6th Reprint, Pearson Education, 2014 Chapters : 1- 10.

REFERENCE BOOKS

1. ***Software Quality and Testing: A Concise Study,*** S. A. Kelkar, 3rd Edition, PHI Learning, 2012.
2. ***Software Testing, Principles and Practices,*** Srinivasan Desikan, Gopalaswamy Ramesh, Pearson Education Inc., 2015
3. ***Software Testing- Principles, Techniques and Tools,*** M.G. Limaye, Tata McGraw-Hill Pvt. Ltd. 2017

NEW

III B.Sc. Computer Science

SEMESTER –VI

5%

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
UACS	B6ME5	Software Testing	Major Elective	5	5

COURSE DESCRIPTION

To study fundamental concepts in software testing including software testing objectives, process, criteria, strategies, and methods.

COURSE OBJECTIVE/S

- To examine fundamental software testing and program analysis techniques.
- To understand the important phases of testing
- To emphasize the significance of each phase when testing different types of software.

UNITS

UNIT I : PRINCIPLES OF TESTING (15 Hrs)

Principles of Testing: Context of Testing in Producing Software – About this Chapter – The Complete Car – Dijkstra's Doctrine – A test In Time! – The Cast and Saint – Test the Tests First! – The Pesticide Paradox – The Convoy and the Rags – The Policemen on the Bridge- The Ends of the Pendulum – Men in Black – Automation Syndrome. *Software Development Life Cycle Models*: Phases of Software Project – Quality, Quality Assurance and Quality Control - Testing, Verification, and Validation – Process Model to Represent Different Phases – Life Cycle models.

UNIT II :WHITE BOX TESTING (15 Hrs)

White Box Testing: What is White Box Testing – Static Testing – Structural Testing – Challenges in White Box Testing.*Black Box Testing*: What is Black Box Testing- Why Black Box Testing – When to do Black Box Testing - How to do Black Box Testing – Conclusion.

UNIT III :INTEGRATION TESTING **(15 Hrs)**

*Integration Testing:*What is Integration Testing - Integration Testing as a Type of Testing – Integration Testing as a Phase of Testing – Scenario Testing – Defect Bash - Conclusion. *System and Acceptance Testing:*System Testing Overview – Why is System Testing Done – Functional Versus Non-Functional Testing – Functional System Testing – Non Functional Testing - Acceptance testing – Summary of Testing Phases.

UNIT IV : PERFORMANCE TESTING **(15 Hrs)**

*Performance Testing***:** Introduction – Factors Governing Performance testing – Methodology for Performance Testing- Tools for Performance Testing – Process for Performance Testing. *Regression Testing:* What is Regression Testing – Types of Regression Testing – When to Regression Testing – How to Regression Testing – Best Practices in Regression Testing.

UNIT V : TESTING TOOLS **(15 Hrs)**

WinRunner – Overview of WinRunner – Testing an application using WinRunner – Test Script Language – GUI Map File – Synchronization of Test Cases – Data Driven Testing – Rapid Test Script Wizard – Mapping Custom Object to a Standard Class - Checking GUI Objects.

DYNAMISM: (For CIA Only)

UNIT V: Data Driven Testing – Rapid Test Script Wizard – Mapping Custom Object to a Standard Class - Checking GUI Objects.

TEXT BOOKS

1. ***Software Testing Principles and Practices,*** Srinivasan Desikan, Gopalaswamy, Ramesh, 1st Edition, 6th Reprint, Pearson Education, 2014.
   Chapters : 1- 8.
2. ***Software Testing Tools*****,** Dr.K.V.K.K.Prasad, Published by Dreamtech Press, Edition, 2012.Chapters : 4

REFERENCE BOOKS

1. ***Software Quality and Testing: A Concise Study,*** S. A. Kelkar, 3rd Edition, PHI Learning, 2012.
2. ***Software Testing, Principles and Practices,*** Srinivasan Desikan, Gopalaswamy Ramesh, Pearson Education Inc., 2015
3. ***Software Testing- Principles, Techniques and Tools,*** M.G. Limaye, Tata McGraw-Hill Pvt. Ltd. 2017.

OLD

2019 - 2020
III B.Sc. Computer Science - V SEMESTER
MAJOR ELECTIVE
B6ME6 - CLOUD COMPUTING

HRS/WEEK : 5 **CREDITS : 5**

COURSE OUTCOMES

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

CO1. Define cloud computing and related concepts
CO2. Explain the key dimensions of the challenges of Cloud Computing
CO3. Discuss the assessment of the economics , financial, and technological implications for selecting cloud computing for an organization
CO4. Describe the benefits of cloud computing and to understand different layers of the cloud technologies, practical solutions
CO5. Explain the challenges of cloud computing and determine the suitability of in-house v/s hosted solutions

SYLLABUS

UNIT I : Defining Cloud Computing (15 Hrs)

Defining Cloud Computing - Cloud Types – Examining the Characteristics of Cloud Computing – Assessing th Role of Open standards – Understanding Cloud Architecture: Exploring the Cloud Computing Stack. Composability, Infrastructure - Platforms - Virtual Appliances - Communication protocols - Applications - Connecting to the cloud

UNIT II : Understanding Services and Applications by type (15 Hrs)

Defining Infrastructure as a Service - Defining Platform as a Service - Defining Software as a Service - Defining Identity as a Service - Defining Compliance as a Service

UNIT III : Understanding Abstraction and Virtualization (15 Hrs)

Using Virtualization Technologies, Load balancing and Virtualization, Understanding Hypervisors, Understanding Machine Learning, Porting Applications

UNIT IV : Understanding Cloud Securituy (15 Hrs)

Securing the Cloud -Securing the data - Moving applications to the cloud - Cloud Storage: Definition – Provisioning –Cloud storage - Cloud Backup solutions - Cloud storage Interoperability

UNIT V : Moving applications to the Cloud (15 Hrs)

Applications to the Cloud – Applications and Cloud API Case Study: Google Web Services- Amazon Web Services - Microsoft Cloud Services.

TEXT BOOK

Cloud Computing Bible, Barrie Sosinsky, Wiley India Pvt. Ltd.- 2011
Chapters: 1,3,4,5,12,14

REFERENCE BOOKS

1. ***Cloud Computing with Windows Azure Platform***, Roger Jennings, Wiley India Pvt. Ltd2009.
2. ***Cloud Computing,*** Bloor R., Kanfman M., Halper F. Judith Hurwitz, " Wiley India Edition,2010
3. ***Cloud Computing Implementation Management and Strategy***, John Rittinghouse & James Ransome, CRC Press, 2010
4. **Cloud Computing: Concepts and Practice**, Naresh Kumar Sehgal and Pramod Chandra P.Bhatt, Springer, 2018

NEW

III B.Sc. Computer Science

5%

SEMESTER –VI

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
UACS	B6ME6	Cloud Computing	Major Elective	5	5

COURSE DESCRIPTION

This course presents a top-down view of cloud computing, from applications and administration to programming and infrastructure.

COURSE OBJECTIVES

- To learn distributed communication
- To understand distributed resource management
- To study the basics of cloud computing
- To study about virtualization and cloud resource management

UNITS

UNIT I :Defining Cloud Computing (15 Hrs)

Defining Cloud Computing - Cloud Types – Examining the Characteristics of Cloud Computing – Assessing th Role of Open standards – Understanding Cloud Architecture: Exploring the Cloud Computing Stack. Composability, Infrastructure - Platforms - Virtual Appliances - Communication protocols - Applications - Connecting to the cloud

UNIT II :Understanding Services and Applications by type (15 Hrs)

Defining Infrastructure as a Service - Defining Platform as a Service - Defining Software as a Service - Defining Identity as a Service - Defining Compliance as a Service

UNIT III :Understanding Abstraction and Virtualization (15 Hrs)

Using Virtualization Technologies, Load balancing and Virtualization, Understanding Hypervisors, Understanding Machine Learning, Porting Applications

NIT IV : Understanding Cloud Securituy (15 Hrs)

Securing the Cloud -Securing the data - Moving applications to the cloud - Cloud Storage: Definition – Provisioning –Cloud storage - Cloud Backup solutions - Cloud storage Interoperability

UNIT V :Moving applications to the Cloud (15 Hrs)

Applications to the Cloud – Applications and Cloud API Case Study: Google Web Services- Amazon Web Services - Microsoft Cloud Services.

SELF STUDY: DYNAMISM :(For CIA Only)

UNIT V: Amazon Web Services - Microsoft Cloud Services.

TEXT BOOK

***Cloud Computing Bible*,** BarrieSosinsky, Wiley India Pvt. Ltd.- 2011

Chapters: 1,3,4,5,12,14

REFERENCE BOOKS

1. ***Cloud Computing with Windows Azure Platform***, Roger Jennings, Wiley India Pvt. Ltd2009.
2. ***Cloud Computing*,** Bloor R., Kanfman M., Halper F. Judith Hurwitz, " Wiley India Edition, 2010
3. ***Cloud Computing Implementation Management and Strategy***, JohnRittinghouse& James Ransome, CRC Press, 2010
4. **Cloud Computing: Concepts and Practice**, Naresh Kumar Sehgal and Pramod Chandra P.Bhatt, Springer, 2018

OLD

2019 – 2020
III B.Sc. Computer Science - VI SEMESTER
MAJOR ELECTIVE
B6ME7 - INTRODUCTION TO ARTIFICIAL INTELLIGENCE

HRS/WEEK: 5 **CREDITS : 5**

COURSE OUTCOMES

On the successful completion of the course, students will be able to
CO1 : Differentiate AI method of problem solving from normal method
CO2 : Identify heuristics for a given problem
CO3 : Explain the various search techniques
CO4 : Explain predicate logic
CO5 : Describe the fundamentals of Game Playing, NLP, NN and Expert Systems

SYLLABUS

UNIT I : Introduction To AI **(15 Hrs)**

Artificial Intelligence: The AI Problems – The Underlying Assumption – AI Technique – The level of the Model – Criteria for Success. Problems, Problem Spaces and Search: Defining the Problem as a State Space Search – Production Systems – Problems Characteristics – Production System Characteristics – Issues in the Design of Search Programs – Additional Problems.

UNIT II : Heuristic Search Techniques **(15 Hrs)**

Generate-and-Test – Hill Climbing – Best-First Search – Problem Reduction – Constraint Satisfaction – Means-Ends Analysis.

UNIT III : Knowledge Representation **(15 Hrs)**

Representing Knowledge using Rules: Procedural versus Declarative knowledge – Logic Programming – Forward versus Backward Reasoning – Matching – Control Knowledge. Knowledge Representation issues: Representations and Mappings – Approaches to Knowledge Representation – Issues in Knowledge representation - The Frame Problem.

UNIT IV : Predicate Logic **(15 Hrs)**

Using Predicate Logic: Representing Simple Facts in Logic – Representing instance and isa Relationships – Computable Functions and Predicates – Resolution – Natural Deduction.

UNIT V: Introduction To Nlp, Neural Nets, Game Playing, Expert Systems **(15 Hrs)**

Game Playing: Overview – The Minimax Search Procedure. Natural Language Processing: Introduction. Connectionist Models: Introduction - Hopfield Networks – Learning in Neural Networks: Perceptrons. Expert Systems: Representing and Using Domain Knowledge – Expert System Shells – Explanation – Knowledge acquisition.

TEXT BOOK

Artificial Intelligence, Elaine Rich, Kevin Knight and Shivashankar B Nair, 3rd Edition, Tata McGraw-Hill publications, 2014 Reprint.
Chapters : 1 - 6 , 12.1, 12.2, 15.1, 18.1, 18.2.1, 20

REFERENCE BOOKS

1. ***Principles of Artificial Intelligence***, Nils J Nilson, Narosa Publishing House, 1982.
2. ***Artificial Intelligence,*** Elaine Rich, Tata McGraw-Hill publications, 2008.
3. ***Foundations of Artificial Intelligence and Expert System***, V.S.Janakiraman K. Sarukesi, P.Gopalakrishnan, Infinity Press, 1st Edition, 2016.

NEW

III B.Sc. Computer Science

SEMESTER –VI

5%

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
UACS	B6ME7	Introduction To Artificial Intelligence	Major Elective	5	5

COURSE DESCRIPTION

The course aims to orient the students to develop interest towards Artificial Intelligence(AI) the latest technology.

COURSE OBJECTIVES

- To provide the basic ideas on AI
- To impart knowledge on the various search techniques and the basic functioning of AI
- To impart the basics of NLP, Game Playing and Neural Networks
- To instil the research acumen by providing the fundamentals of AI

SYLLABUS

UNIT I: INTRODUCTION TO AI [15 HRS]

Artificial Intelligence: The AI Problems – The Underlying Assumption – AI Technique – The level of the Model – Criteria for Success. Problems, Problem Spaces and Search: Defining the Problem as a State Space Search – Production Systems – Problems Characteristics – Production System Characteristics – Issues in the Design of Search Programs – Additional Problems.

UNIT II: HEURISTIC SEARCH TECHNIQUES [15 HRS]

Generate-and-Test – Hill Climbing – Best-First Search – Problem Reduction – Constraint Satisfaction – Means-Ends Analysis.

UNIT III: KNOWLEDGE REPRESENTATION [15 HRS]

Representing Knowledge using Rules: Procedural versus Declarative knowledge – Logic Programming – Forward versus Backward Reasoning – Matching – Control Knowledge. Knowledge Representation issues: Representations and Mappings – Approaches to Knowledge Representation – Issues in Knowledge representation - The Frame Problem.

UNIT IV: PREDICATE LOGIC [15 HRS]

Using Predicate Logic: Representing Simple Facts in Logic – Representing instance and isa Relationships – Computable Functions and Predicates – Resolution – Natural Deduction.

UNIT V: INTRODUCTION TO NLP, NEURAL NETS, GAME PLAYING [15 HRS]

Game Playing: Overview – The Minimax Search Procedure. Natural Language Processing: Introduction. Connectionist Models: Introduction - Hopfield Networks – Learning in Neural Networks: Perceptrons.

SELF STUDY : DYNAMISM :(For CIA Only)

UNIT I : Issues in the Design of Search Programs – Additional Problems.

UNIT III: Approaches to Knowledge Representation – Issues in Knowledge representation - The Frame Problem

UNIT VI:

Latest developments in Artificial Intelligence

TEXT BOOK

Artificial Intelligence, Elaine Rich, Kevin Knight andShivashankar B Nair, 3rd Edition, Tata McGraw-Hill publications, 2014 Reprint.

Chapters : 1 - 6 , 12.1, 12.2, 15.1, 18.1, 18.2.1

REFERENCE BOOKS

1. ***Artificial Intelligence,*** Elaine Rich, Tata McGraw-Hill publications, 2008.

2. ***Foundations of Artificial Intelligence and Expert System***, V.S.Janakiraman K. Sarukesi, P.Gopalakrishnan, Infinity Press, 1st Edition, 2016.

OLD

2019 – 2020
III B.Sc. Computer Science - VI SEMESTER
MAJOR ELECTIVE
B6ME8 - PRINCIPLES OF MOBILE COMPUTING

HRS/WEEK: 5 **CREDITS : 5**

COURSE OUTCOMES

On the successful completion of the course, students will be able to
CO1:Explain Pervasive Computing
CO2:Identify different operating systems
CO3:Discuss the importance of Security
CO4:Explain Internet Protocols
CO5:Describe different Gateways

SYLLABUS

UNIT- I: Introduction **(15 Hrs)**

What Pervasive Computing is all about: - Times are Changing – Decentralization Continues – Applied Pervasive Computing - Pervasive Computing Principles – Pervasive Information Technology
Information Access Devices : -Hand held Computers – Palm OS-Based Devices – Windows CE-Based Handheld Computers – EPOC Based handled Computers – Sub Notebooks – Phones – Cellular Phones – Data Transmission Capabilities – Smart Phones – Screen Phones – Smart Cards – Smart Labels – Smart Tokens

UNIT- II: Operating Systems **(15 Hrs)**

Windows CE - Palm OS -Symbian OS – Java Card

UNIT- III: Client Middleware and Security **(15 Hrs)**

Overview – Programming APIs – Smart Card Programming – Messaging Components – Database Components. The Importance of Security – Cryptographic Patterns and Methods – Cryptographic Tools – Secure Socket Layer (SSL)

UNIT- IV: Internet Protocols and Formats Mobile Internet **(15 Hrs)**

Hypertext Transfer Protocol (HTTP) – Hypertext Markup Language (HTML) – Extensible Markup Language (XML) – XForms
The WAP 1.1 Architecture – Wireless Application Environment 1.1 – WAP 2.0 Architecture – i-mode

UNIT- V: Gateways and Application Servers **(15 Hrs)**

Connectivity Gateway – Palm Webclipping Proxy Server – WAP Gateway – Wireless Gateway – Transcoding – InfoPyramid Framework - ProxiNet Transcoding Gateway – Residential Gateway
Architecture and Components – IBM WebSphere Application Server – Oracle9i Application Server – BEA WebLogic Platform – Sun ONE Web Server.

TEXT BOOK

Principles of Mobile Computing, Uwe Hansmann, Lothar Merk, Martin S.Nicklous, Thomas Stober, 2nd Edition, Springer International Edition, 2015.
Chapters : 1, 2 ,7 - 11, 16, 17

REFERENCES

1. ***Wireless Networks***, Client Smith & Daniel Collins, 3rd Edition, McGraw Hill Publication, 2014.
2. ***Mobile Computing***, *Raj Kamal, 2nd Edition,Oxford University Press, 2014.*
3. ***Mobile Computing,*** *Asoke K Talukder,Hasan Ahmed, Roopa R Yavagal, 2nd Edition,* McGraw Hill Publication, 2017.

NEW

III B.Sc. Computer Science

SEMESTER –VI

5%

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
UACS	B6ME8	Mobile Computing using Android	Major Elective	5	5

COURSE DESCRIPTION

This Course provides overview of coverage of various wireless networks and explains how different stations work with agents to connect mobile world.

COURSE OBJECTIVES

- To enable the students to understand the OS, protocols and security used in mobile technology
- To introduce the concept of mobile computing and provide a foundation for research

SYLLABUS

UNIT I: MOBILE COMMUNICATIONS AN OVERVIEW [15 HRS]

Mobile Communication –Mobile Computing-Mobile Computing Architecture-Mobile Devices-Mobile System Networks-Data Dissemination – Mobile Management-Security.

UNIT II: MOBILE DEVICES AND SYSTEM [15 HRS]

Cellular Network and Frequency Reuse-Mobile Smart Phones, Smart Mobiles, and Systems-Handled Pocket Computers-Handled Devices.GSM and Other 2G Architectures:

GSM-Services and System Architecture-Radio Interfaces of GSM-Protocols of GSM-Localization –Call Handling.

UNIT III:INTRODUCTION TO ANDROID OPERATING SYSTEM [15 HRS]

Android-open handset alliance-android ecosystem-android version – android activity-features of android-android architecture-stack linux kernel.

UNIT IV: CONFIGURATION OF ANDROID ENVIRONMENT [15 HRS]

Operating System-Java JDK-Android SDK-Android Development Tools(AVD)-Emulators-Dalvik Virtual Machine-Difference Between Java Virtual Machine and Dalvik Virtual Machine.

UNIT V: ANDROID USER INTERFACE [15 HRS]

Linear Layout-Absolute Layout-Frame Layout-Relative Layout-Table Layout.

Designing Your User Interface with View:

Text View-Button-Image Button-Edit Text-Check Box-Toggle Button-Radio Button and Radio Group-Progress Bar-Autocomplete Text View-Spinner-List View-Grid View-Image View-Scroll View-Custom Toast Alert-Time And Date Picker.

SELF STUDY : DYNAMISM :(For CIA Only)

UNIT IV : Operating System-Java JDK-Android SDK, Difference Between Java Virtual Machine and Dalvik Virtual Machine

TEXT BOOK

1. ***MOBILE COMPUTING*** –Raj Kamal ,Second Edition,2014, Oxford University Press, 2014
2. ***ANDROID***-Prasanna Kumar Dixit,Vikas Publishing House Pvt Ltd, 2014

REFERENCE BOOKS

1. ***MOBILE COMPUTING Technology ,Application and Service Creation*** – Asoke K

Talukder, Ph.D. ,Second Edition ,Tata Mc Graw Hill Education Private Limited, 2011

2. ***ANDROID APPLICATION DEVELOPMENT(with kitkat support)***Black Book,

Pradeep Kothari, Published By Dreanlech, 2017

3. ***BEGINNING ANDROID 4 APPLICATION DEVELOPMENT ,***Wei-Meng Lee Published By WileY, 2016

OLD

2019 - 2020
III B.Sc. Computer Science - VI SEMESTER
MAJOR ELECTIVE
B6ME9 - BIG DATA FUNDAMENTALS

HRS/WEEK : 5 **CREDITS : 5**

COURSE OUTCOMES

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

CO1: Explain the fundamental concepts of Big data
CO2: Describe Big data Adoption and Planning
CO3: Explain Big data Storage Concept
CO4: Utilize Big data and Processing Concepts
CO5: Demonstrate Big Data Analysis Techniques.

SYLLABUS

UNIT I : **(15 Hrs)**

Understanding Big Data: Concepts and Terminology - Big Data Characteristics - Different types of data. Business Motivations and Drivers for Big data Adoption: Marketplace Dynamics - Business Architecture - Business Process Management - Information and Communications Technology - Internet of Everything - Case Study Example.

UNIT II : **(15 Hrs)**

Big data Adoption and Planning Considerations: Organization Prerequisites - Data Procurement – Privacy – Security – Provenance - Limited Realtime Support - Distinct Performance Challenges - Distinct Governance Requirements - Distinct Methodology – Clouds - Big Data Analytics Lifecycle - Case Study Example.

UNIT III : **(15 Hrs)**

Enterprise Technologies and Big Data Business Intelligence: Online Transaction Processing(OLTP) - Online Analytical Processing(OLAP) - Extract Transform Load(ETL) - Data Warehouses - Data Marts- Traditional BI- Big Data BI- Case Study Example. Big Data Storage Concepts: Clusters - File Systems and Distributed File Systems - NoSQL – Sharding – Replication - Sharding and Replication - CAP Theorem – ACID – BASE - Case Study Example.

UNIT IV : **(15 Hrs)**

Big Data Processing Concepts: Parallel Data Processing - Distributed Data Processing – Hadoop - Processing Workloads – Cluster - Processing in Batch Mode - Processing in Realtime Mode - Case Study Example.

UNIT V: **(15 Hrs)**

Big Data Storage Technology: On-Disk Storage Devices – NoSQL Databases - In-Memory Storage Devices -Case Study Example. Big Data Analysis Techniques: Quantitative Analysis - Qualitative Analysis - Data Mining - Statistical Analysis - Machine Learning - Semantic Analysis - Visual Analysis - Case Study Example.

TEXT BOOK

Big Data Fundamentals Concepts, Driver & Techniques, Thomas Erl,Wajid Khattak and Paul Buhler, 3rd Edition, Pearson publication, 2018. Chapters : 1-8

REFERENCE BOOKS

1. ***Big Data Strategies*** , Pam Baker ,1st edition , Cengage Learning India Private Limited, 2016.
2. ***Big Data,*** Dr. Anil Maheshwari, 1st edition , Published by McGraw Hill Education (India) Private Limited, 2017.
3. ***Big Data and Analytics***, Seema Acharya and Subhashini Chellappan, 2nd edition ,Wiley India Private Limited, 2017.

NEW

III B.Sc. Computer Science

SEMESTER –VI

5%

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDS
UACS	B6ME9	Big Data Fundamentals	Major Elective	5	5

COURSE DESCRIPTION

Big Data Fundamentals consists of Big Data: Concepts and Terminology, Big data Adoption and Planning, Enterprise Technologies and Big Data Business Intelligence and its Storage Technology.

COURSE OBJECTIVES

- To Understand the fundamental concepts of Big data
- To interpret Big data Adoption and Planning and Big data Storage Concept
- To Understand Big data and Processing Concepts and Big Data Analysis Techniques

SYLLABUS

UNIT I : INTRODUCTION (15 Hrs)

Understanding Big Data: Concepts and Terminology - Big Data Characteristics - Different types of data.Business Motivations and Drivers for Big data Adoption: Marketplace Dynamics - Business Architecture - Business Process Management - Information and Communications Technology - Internet of Everything - Case Study Example.

UNIT II : ADOPTION AND PLANNING (15 Hrs)

Big data Adoption and Planning Considerations: Organization Prerequisites - Data Procurement – Privacy – Security – Provenance - Limited Realtime Support - Distinct Performance Challenges - Distinct Governance Requirements - Distinct Methodology – Clouds - Big Data Analytics Lifecycle - Case Study Example.

UNIT III : BIG DATA BUSINESS INTELLIGENCE (15 Hrs)

Enterprise Technologies and Big Data Business Intelligence: Online Transaction Processing(OLTP) - Online Analytical Processing(OLAP) - Extract Transform Load(ETL) - Data Warehouses - Data Marts- Traditional BI- Big Data BI- Case Study Example. Big Data Storage Concepts: Clusters - File Systems and Distributed File Systems - NoSQL – Sharding – Replication -

Sharding and Replication - CAP Theorem – ACID – BASE - Case Study Example.

UNIT IV : BIG DATA PROCESSING CONCEPTS (15 Hrs)

Big Data Processing Concepts: Parallel Data Processing - Distributed Data Processing – Hadoop - Processing Workloads – Cluster - Processing in Batch Mode - Processing in Realtime Mode - Case Study Example.

UNIT V: STORAGE TECHNOLOGY (15 Hrs)

Big Data Storage Technology: On-Disk Storage Devices – NoSQL Databases - In-Memory Storage Devices -Case Study Example. Big Data Analysis Techniques: Quantitative Analysis - Qualitative Analysis - Data Mining - Statistical Analysis - Machine Learning - Semantic Analysis - Visual Analysis - Case Study Example.

SELF STUDY : DYNAMISM :(For CIA Only)

UNIT I : Information and Communications Technology - Internet of Everything - Case Study Example.

UNIT III :- Data Warehouses - Data Marts- Traditional BI- Big Data BI- Case Study Example.

TEXT BOOK

Big Data Fundamentals Concepts, Driver & Techniques, Thomas Erl,WajidKhattak and Paul Buhler, 3rd Edition, Pearson publication, 2018. Chapters : 1-8

REFERENCE BOOKS

1. ***Big Data Strategies*** , Pam Baker ,1st edition , Cengage Learning India Private Limited, 2016.
2. ***Big Data,*** Dr. Anil Maheshwari, 1stedition , Published by McGraw Hill Education (India) Private Limited, 2017.
3. ***Big Data and Analytics***, Seema Acharya andSubhashiniChellappan, 2nd edition, Wiley India Private Limited, 2017.

Digital Open Educational Resources (DOER)

1. https://www.tutorialspoint.com/big_data_analytics/index.htm
2. https://www.guru99.com/bigdata-tutorials.html
3. https://www.youtube.com/watch?v=KcecJfxbd-4

2019 - 2020
II B.Sc. Computer Science - III SEMESTER
SKILL BASED ELECTIVE
B3SB1 - Internet Programming Paper I: INRODUCTION TO INTERNET

OLD

HRS/WEEK : 2 **CREDITS : 2**

COURSE OUTCOMES

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

CO1: Discuss the way in which internet is used, classify the different types of connections.
CO2: Describe the working of web browsers and demonstrate searching the web using effective web browsing tips
CO3: Design a simple web site and discuss the method for web hosting.
CO4: Identify internet addressing and various internet protocols used for the communication.
CO5: Explain the tips and techniques for managing the e-mails and protecting the privacy.

SYLLABUS

UNIT I : **(6 Hrs)**
Introduction to Internet – What is Internet – How does Internet works – What is special about the Internet – A brief history of Internet. How Internet Works – People and Organizations – Hardware. Getting Connected – Dial-up connection – Dedicated lines – ISDN – DSL – Cable Modem – Satellite Internet – Cellular broadband – Wired and Wireless Broadband Internet Access – Choosing the best Internet connection.

UNIT II : **(6 Hrs)**
World Wide Web (WWW) – Internet and Web – How the web works – A brief history of WWW. Web Browsers and Web Browsing : Web Browsers – Types of Browser – Web Browsing Tips.

UNIT III : **(6 Hrs)**
Searching the Web – Information Source – Finding Information on the Internet – Searching the Web – Tips for Internet Research. Websites and Web Pages – Web Design – Creating a Website – Web Hosting – Website Promotion

UNIT IV : **(6 Hrs)**
Internet Addressing - IP address – Domain Names – Domain Name System – Uniform Resource Locator (URL). Internet Protocols – Transmission Control Protocol / Internet Protocol (TCP/IP) – File Transfer Protocol (FTP) – Hypertext Transfer Protocol (HTTP) – Telnet – Gopher – WAIS.

UNIT V : **(6 Hrs)**
E-mail – How E-mail Works – Why use E-mail – E-mail – Names and Addresses = Mailing Basics – E-mail Ethics – Spamming – E-mail – Advantages and disadvantages – Smileys – Free e-mail Providers. Anonymity, Safety and Privacy – Privacy – Anonymity – Encryption – Understanding Safety and Privacy – Viruses – Virus from E-mails – Virus from Websites.

TEXT BOOK :

Internet for Everyone, Alexis Leon, Mathew Leon, Leon Tech World Publication, 2012.
Chapters: 1 – 8

REFERENCE BOOKS:

1. ***How the Internet works***, Preston Gralla, Pearson Education Publication, 2012.
2. ***The Internet Book,*** Douglas E.Comer, Pearson Education Publication, 2015.

NEW

II B.Sc. Computer Science

SEMESTER –III

5%

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
UACS	19B3SB1	INTERNET PROGRAMMING - PAPER I INRODUCTION TO INTERNET	SKILL BASED ELECTIVE	2	2

COURSE DESCRIPTION

This course facilitates the students to understand the basics of Internet, its architecture, uses, technology and the potential threats in the introductory level.

COURSE OBJECTIVES

- To facilitate the students to explore the basics of internet.
- To introduce how data can be shared and accessed thru' internet.

SYLLABUS

UNIT I :INTRODUCTION TO INTERNET (6 Hrs)

Introduction to Internet – What is Internet – How does Internet works – What is special about the Internet – A brief history of Internet. How Internet Works – People and Organizations – Hardware. Getting Connected – Dial-up connection – Dedicated lines – ISDN – DSL – Cable Modem – Satellite Internet – Cellular broadband – Wired and Wireless Broadband Internet Access – Choosing the best Internet connection.

UNIT II : WORLD WIDE WEB (6 Hrs)

World Wide Web (WWW) – Internet and Web – How the web works – A brief history of WWW. Web Browsers and Web Browsing : Web Browsers – Types of Browser – Web Browsing Tips.

UNIT III : SEARCHING THE WEB (6 Hrs)

Searching the Web – Information Source – Finding Information on the Internet – Searching the Web – Tips for Internet Research. Websites and Web Pages – Web Design – Creating a Website – Web Hosting – Website Promotion

UNIT IV : INTERNET ADDRESSING (6 Hrs)

Internet Addressing - IP address – Domain Names – Domain Name System – Uniform Resource Locator (URL). Internet Protocols – Transmission Control Protocol / Internet Protocol (TCP/IP) – File Transfer Protocol (FTP) – Hypertext Transfer Protocol (HTTP) – Telnet – Gopher – WAIS.

UNIT V :E-MAIL **(6 Hrs)**

E-mail – How E-mail Works – Why use E-mail – E-mail – Names and Addresses = Mailing Basics – E-mail Ethics – Spamming – E-mail – Advantages and disadvantages – Smileys – Free e-mail Providers. Anonymity, Safety and Privacy – Privacy – Anonymity – Encryption – Understanding Safety and Privacy – Viruses – Virus from E-mails – Virus from Websites.

SELF STUDY : DYNAMISM :(For CIA Only)

UNIT III : Websites and Web Pages – Web Design – Creating a Website

UNIT V :E-mail – Advantages and disadvantages –Understanding Safety and Privacy – Viruses – Virus from E-mails – Virus from Websites.

TEXT BOOK

Internet for Everyone, Alexis Leon, Mathew Leon, Leon Tech World Publication, 2012.

Chapters: 1 – 8

REFERENCE BOOKS

1. ***How the Internet works***, Preston Gralla, Pearson Education Publication, 2012.

The Internet Book, Douglas E.Comer, Pearson Education Publication, 2015.

2019 – 2020

OLD

II B.Sc. Computer Science - IV SEMESTER

SKILL BASED ELECTIVE

B4SB2 – Internet Programming Paper II: WEB DESIGNING USING HTML

HRS/WEEK : 2 **CREDITS : 2**

COURSE OUTCOMES

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

CO1:	Create simple web page using physical tags
CO2:	Present the information in standard form in a web page using structure tags supported by the browsers
CO3:	Design the layout for a web page using browser support tags
CO4:	Develop a web site with the provision to go around all pages
CO5:	Design layout for a web document using frames

SYLLABUS

UNIT- I: Essential Html **(6 Hrs)**

The history of HTML – HTML – Browser Wars – Creating a Web Page – Installing a Web Page – Viewing a Web Page – Checking Your Web Page.<!DOCTYPE> -<HTML> – Creating The structures of a Web page's: Head and Body – Setting Web Page Colors – Adding Text to a Web Page - basic Text formatting - <!..> Comments and server-Side includes - </Body>- </HTML>

UNIT- II: Working with Text: **(6 Hrs)**

Formatting with HTML tags – Physical HTML styles – Logical HTML styles – Setting Fonts – Headings - some remove tags - Displaying Plain text - <H1> Through <H6>- Creating Web Page Headings - <B> -<I> - <TT> - <U> - <S> and <Strike> - <BIG> - -<SMALL> - <SUB> - <SUP> -<EM> - <Strong> - <CODE> - <SAMP> - <KBD> - <VAR> - <DFN> - <CITE> - <ABBR> - <Acronym> - <FONT> – setting font point size directly- <BASEFONT> - <Q> - <Blink> - <INS> - <DEL> - <Address>- <BDO> – Displaying Special Characters: Character Entities

UNIT- III: Presenting and Arranging Text **(6 Hrs)**

Arranging text - Using <DIV> and <SPAN> - Using Layers – More Formatting Power – preformatting Text - Avoiding Plain text Wrapping -
 -<NOBR> - - <WBR> - <P> - <HR> - <CENTER> <BlockQuote> - <PRE> - <MULTICOL> - <SPACER> - <MARQUEE> - <DIV> - <SPAN> - Formatting text with tables–- <Layer> - <NOLAYER> - <ILAYER> Positioning text with <DIV> - <Ruby> and <RT> Creating Ruby (Captioned) Text.

UNIT- IV: Creating List and Tables **(6 Hrs)**

Creating List - <LI> - <UL> - <OL>– Creating Customized Unordered lists - Creating Customized ordered lists - <DL>, <DT> and DD> - Creating Definition Lists – Nesting Lists - <DIR> and <Menu>- Deprecated Lists. The Parts of a table – Creating a Table – Adding Border – Padding Your Cells – Widening the cell spacing – Aligning your data Horizontally – Aligning your data vertically – Spanning Columns – Spanning Rows- Setting Colors. <TABLE> - <TR>- <TH> - <TD> - <CAPTION> - setting table Border Widths – Setting Cell padding – Setting cell spacing – Setting table column and widths – Setting table Colors – Aligning table in Web Pages – Aligning Cell text – Using images in tables – Nesting tables - Spanning multiple columns - Spanning multiple rows - <THEAD>, <TBODY>, and <TFOOT> - Grouping and Formatting Rows – Formatting text with tables.

UNIT- V: Working with Frames **(6 Hrs)**

To frame or Not to frame – Named Frames- <FRAMESET> - <FRAME> - Creating vertical Frames- Creating Horizontal Frames- Creating both Horizontal and vertical Frames – Using Named frames as Hyperlink Targets – Using predefined Target Names – Handling Browsers That don't handle frames- Opening New Browser windows – Creating borderless frames - Creating navigation Bars – Enabling and Disabling Scrolling – Stopping Frames from Being resized – Setting Frame border Thickness – Setting Frame Color - <IFRAME>- Creating Borderless inline Frames.

TEXT BOOK

HTML Black Book, Steven Holzner, Dreamtech Press, 2000. Chapters: 1, 2, 3, 5, 6,7

REFERENCE BOOKS

1. ***Mastering HTML, CSS & Javascript web Publishing,*** Laura Lemay, Rafe Colburn & Jennifer Kyrnin, BPB publications, 2016
2. ***HTML & CSS the complete reference,*** Thomas A Powell, 5th edition, McGrawHill, New Delhi, 2017.

NEW

II B.Sc. Computer Science

SEMESTER –IV

5%

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
UACS	19B4SB2	Internet Programming : Paper II Web Designing using HTML and WordPress	Skill Based Elective	2	2

COURSE DESCRIPTION

This course aims to impart skills to design and develop web pages using HTML and to design website using open source package.

COURSE OBJECTIVES

- **To prepare the students to design their own web pages.**
- To use and to customize the templates as per the requirement.
- To enable the students to develop dynamic web pages and to uploadthe documents.

SYLLABUS

UNIT I: ESSENTIAL HTML (6 Hrs)

The history of HTML – HTML – Browser Wars – Creating a Web Page – Installing a Web Page – Viewing a Web Page – Checking Your Web Page.<!DOCTYPE> -<HTML> – Creating The structures of a Web page's: Head and Body – Setting Web Page Colors – Adding Text to a Web Page - basic Text formatting - <!..> Comments and server-Side includes - </Body>- </HTML>

UNIT II: WORKING WITH TEXT (6 Hrs)

Formatting with HTML tags – Physical HTML styles – Logical HTML styles – Setting Fonts – Headings - some remove tags - Displaying Plain text - <H1> Through <H6>- Creating Web Page Headings - <B> -<I> - <TT> - <U> - <S> and <Strike> - <BIG> - -<SMALL> - <SUB> - <SUP> -<EM> - <Strong> - <CODE> - <SAMP> -<KBD> - <VAR> - <DFN> - <CITE> - <ABBR> - <Acronym> - <FONT> – setting font point size directly- <BASEFONT> - <Q>

- <Blink> - <INS> - <DEL> - <Address>- <BDO> – Displaying Special Characters: Character Entities

UNIT III: PRESENTING AND ARRANGING TEXT (6 Hrs)

Arranging text - Using <DIV> and <SPAN> - Using Layers – More Formatting Power – preformatting Text - Avoiding Plain text Wrapping -
 -<NOBR> - - <WBR> - <P> - <HR> - <CENTER><BlockQuote> - <PRE> - <MULTICOL> - <SPACER> - <MARQUEE> - <DIV> - <SPAN> - Formatting text with tables– - <Layer> - <NOLAYER> - <ILAYER> Positioning text with <DIV> - <Ruby>and <RT> Creating Ruby (Captioned) Text.

UNIT IV: CREATING LISTAND TABLES (6 Hrs)

Creating List - <LI> - <UL> - <OL>– Creating Customized Unordered lists - Creating Customized ordered lists - <DL>, <DT> and DD> - Creating Definition Lists – Nesting Lists - <DIR> and <Menu>- Deprecated Lists.
The Parts of a table – Creating a Table – Adding Border – Padding Your Cells – Widening the cell spacing – Aligning your data Horizontally – Aligning your data vertically – Spanning Columns – Spanning Rows- Setting Colors.

<TABLE> - <TR>- <TH> - <TD> - <CAPTION> - setting table Border Widths – Setting Cell padding – Setting cell spacing – Setting table column and widths – Setting table Colors – Aligning table in Web Pages – Aligning Cell text – Using images in tables – Nesting tables - Spanning multiple columns - Spanning multiple rows - <THEAD>, <TBODY>, and <TFOOT> - Grouping and Formatting Rows – Formatting text with tables.

UNIT V: WORKING WITH FRAMES (6 Hrs)

To frame or Not to frame – Named Frames- <FRAMESET> - <FRAME> - Creating vertical Frames- Creating Horizontal Frames- Creating both Horizontal and vertical Frames – Using Named frames as Hyperlink Targets – Using predefined Target Names – Handling Browsers That don't handle frames- Opening New Browser windows – Creating borderless frames - Creating navigation Bars – Enabling and Disabling Scrolling – Stopping Frames from Being resized – Setting Frame border Thickness – Setting Frame Color - <IFRAME>- Creating Borderless inline Frames.

DYNAMISM :(For CIA Only)UNIT VI : Working with Wordpress

Introduction to Content management System (CMS) – Themes – Customizing themes – Plugins – Designing a website.

SELF STUDY:

UNIT- II: <H1> Through <H6>- Creating Web Page Headings - <B> -<I> - <TT> - <U> - <S> and <Strike> - <BIG> - -<SMALL> - <SUB> - <SUP> - <EM> - <Strong> - <CODE

TEXT BOOK

1. ***HTML Black Book, Steven Holzner***, Dreamtech Press, 2000

Chapters: 1, 2, 3, 5, 6,7

REFERENCE BOOKS

1. ***Mastering HTML, CSS &Javascript web Publishing,*** Laura Lemay, Rafe Colburn & Jennifer Kyrnin, BPB publications, 2016
2. ***HTML & CSS the complete reference,*** Thomas A Powell, 5th edition, McGrawHill, New Delhi, 2017.
3. **Official Website of Wordpress**

OLD

2019 - 2020
III B.Sc. Computer Science - V SEMESTER
SKILL BASED ELECTIVE
B5SB3 - Internet Programming Paper III:
CLIENT SIDE PROGRAMMING USING JAVA SCRIPT & CSS

HRS/WEEK : 2 **CREDITS : 2**

COURSE OUTCOMES

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

.

CO1: Design a website with boosted styles using style sheets

CO2: Design uniform layout for all pages of a website through tags and style sheets

CO3: Create a webpage with menu bar to navigate through different pages of a website.

CO4: Create a dynamic webpage using java script

CO5: Create a webpage with a facility to collect and validate data

SYLLABUS

UNIT- I: Cascading Style Sheet (6 Hrs)

What are style sheets?-External style sheets - Internal style sheets - Inline styles- creating style classes- Background properties- Position and block properties-Font properties-List properties-Text properties- Table properties.

UNIT- II: HTML Forms and Controls (6 Hrs)

Creating HTML forms – Buttons – Checkboxes – File input - For a From – Hidden data - Image Submit Buttons – Password Controls – Radio Buttons – Reset Buttons – Customizable Button – Select Control – Grouping and Labeling – An Index – Processing Secure Transactions - Events

UNIT-III: Java Script (6 Hrs)

Introduction to Javascript – Adding JavaScript to XHTML documents - the <script> element – using the <script> element- event handlers – Javascript core features – basic definitions – Language characteristics – variables- basic data types – composite types – Flow control statements.

UNIT-IV: Using Java Script (6 Hrs)

Introduction to Window – Dialogs – Opening and closing generic windows – controlling windows – Window events – Form basics – form fields – Form validation – form usability and javascript.

UNIT- V: Java Script Object Models (6 Hrs)

Object Model Overview – the initial JavaScript Object model – The Document Object – Accessing Document Elements by Position - Accessing Document Elements by Name – Event handlers – The DOM and HTML elements – The DOM and CSS.

TEXT BOOKS

1. ***HTML Black Book, Steven Holzner*** – Dreamtech Press, 2000
Chapters : 9, 12
2. ***JavaScript: The complete reference , Thomas Powell & Fritz Schneider*** ,2nd edition, Tata McGraw Hill Education Private Limited, New Delhi, 2014
Chapters : 1,2,,9,10,12,14

REFERENCE BOOKS

1. ***HTML Complete,*** BPB Publications, 2nd Edition, New Delhi, 2003.
2. ***Mastering HTML, CSS & Javascript web Publishing,*** Laura Lemay, Rafe Colburn & Jennifer Kyrnin, BPB publications, 2016
3. ***HTML & CSS the complete reference,*** Thomas A Powell, 5th edition, McGrawHill, New Delhi, 2017.

NEW

III B.Sc. Computer Science

SEMESTER –V

5%

For those who joined in 2018 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
UACS	B5SB3	Internet Programming - Paper III Client Side Programming using Java Script & CSS	Skill Based Elective	2	2

COURSE DESCRIPTION

This course aims to impart skills to design web sites and to develop web applications through scripting languages.

COURSE OBJECTIVES

- **To prepare the students to design and upload their own web pages.**
- To use CSS to control the style and layout of multiple Web pages all at once.
- To Enable the students to examine the flexibility of JavaScript, create scripts, dialog boxes and design web pages using javascript.

SYLLABUS

UNIT I: CASCADING STYLE SHEET (6 Hrs)

What are style sheets?-External style sheets - Internal style sheets - Inline styles- creating style classes- Background properties- Position and block properties-Font properties-List properties-Text properties- Table properties.

UNIT II: HTML FORMS AND CONTROLS (6 Hrs)

Creating HTML forms – Buttons – Checkboxes – File input - For a From – Hidden data - Image Submit Buttons – Password Controls – Radio Buttons – Reset Buttons – Customizable Button – Select Control – Grouping and Labeling – An Index – Processing Secure Transactions - Events

UNIT III: JAVA SCRIPT (6 Hrs)

Introduction to Javascript – Adding JavaScript to XHTML documents - the<script> element – using the <script> element- event handlers – Javascript core features – basic definitions – Language characteristics – variables- basic data types – composite types – Flow control statements.

UNIT IV: USING JAVA SCRIPT (6 Hrs)

Introduction to Window – Dialogs – Opening and closing generic windows – controlling windows – Window events – Form basics – form fields – Form validation – form usability and javascript.

UNIT V: JAVA SCRIPT OBJECT MODELS (6 Hrs)

Object Model Overview – the initial JavaScript Object model – The Document Object – Accessing Document Elements by Position - Accessing Document Elements by Name – Event handlers – The DOM and HTML elements – The DOM and CSS.

SELF STUDY: DYNAMISM :(For CIA Only)

Unit-I: Properties and the values of HTML elements

Unit-III: Basic programming concepts of Javascript

Unit-V: Methods of Document object

TEXT BOOKS

1. ***HTML Black Book, Steven Holzner*** – Dreamtech Press, 2000 Chapters : 9, 12

2. ***JavaScript: The complete reference , Thomas Powell & Fritz Schneider*** ,2nd edition, Tata McGraw Hill Education Private Limited, New Delhi, 2014

Chapters : 1,2,,9,10,12,14

REFERENCE BOOKS

1. ***HTML Complete,*** BPB Publications, 2nd Edition, New Delhi, 2003.
2. ***Mastering HTML, CSS &Javascript web Publishing,*** Laura Lemay, Rafe Colburn & Jennifer Kyrnin, BPB publications, 2016
3. ***HTML & CSS the complete reference,*** Thomas A Powell, 5th edition, McGrawHill, New Delhi, 2017

2019 – 2020

OLD

III B.Sc. Computer Science - V SEMESTER

SKILL BASED ELECTIVE

B5SB4 - Internet Programming Paper IV :

SERVER SIDE PROGRAMMING USING ASP.NET

HRS/WEEK : 2 **CREDITS: 2**

COURSE OUTCOMES

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

CO1 : Define the Basic Concepts, Architecture and Components of .NET FrameWork.
CO2: Discuss and use Web Forms with Standard Controls.
CO3 : Apply validations to standard controls of web form.
CO4 : Design and develop web applications using navigation controls.
CO5 : Write basic SQL commands and develop web applications with DML operations using SQL commands.

SYLLABUS

UNIT I: **(6 Hrs)**

Introduction to .NET FrameWork3.5 and Visual Studio 2008 *:* Introduction - Version of .NET FrameWork – Benefits of .NET Frame Work- Architecture of .NET Frame Work – Components of .NET FrameWork – Introducing Visual Studio 2008- New Features of Visual Studio 2008 - Installing Visual Studio 2008 - Visual Studio 2008 IDE- Developing Visual Studio 2008 Applications.

UNIT II: **(6 Hrs)**

Web Forms: Standard Controls: Introduction – Control Class Using Label Control – Using TextBox Control – Using Button Control –Using ListBox Control – Using RadioButton Control.

UNIT III: **(6 Hrs)**

Web Forms: Navigation Controls: Introduction to Navigation Controls –SiteMapPath Control – Using SiteMapPath Control, Customizing Appearance of the SiteMapPath Control – Menu Control, TreeView Control.

UNIT IV: **(6 Hrs)**

Web Forms: Base Validation Class: Introduction – The Base Validator Class- Using RequiredFieldValidator Control – Using RangeValidator Control – Using RegularExpression Validator Control – Using CompareValidator Control – Using CustomValidator Control – Using ValidationSummary Control. Login Controls: Introduction to Login Controls – Using Login Control – Login View Control – Login Name Control – Using Login Name Control- Login Status Control -Password Recovery Control, Configuring the web.config file for Password Recovery.

UNIT V: **(6 Hrs)**

Working with ADO.NET – Introduction – Basic SQL Statements –SELECT –DELETE – UPDATE – WHERE Clause – BETWEEN Clause – IN Clause – LIKE Clause -DISTINCT Clause – ORDERBY Clause –AS Clause GROUP BY Clause – HAVING Clause. Introducing ADO.NET– New Features in ADO.NET – Components of ADO.NET - basic operation in ADO.NET – Creating a Connection to Data Base – Executing Commands by using the Command objects – Adding and configuring a data adaptor Creating a DataSet – Using Data Adapter to retrieve data in a DataSet. Implementing Data Binding – Introduction – Types of Data Binding - Using GridView Control – DataList Control – Details View Control – FormView Control

TEXT BOOK

Comdex .NET 3.5 Programming Course Kit, Vikas Gupta & Kogent Solutions Inc., Dreamtech Press, Reprint Edition 2008.

Chapters : 2 (in Introduction) 3, 4, 5, and 6 (in ASP.NET3.5) 6 and 7(in C# 2008)

REFERENCE BOOKS

1. ***Microsoft ASP.NET 3.5***, George Shepherd, PHI Pvt Ltd , 2008.
2. ***Professional ASP.NET 3.5 in C# & VB***, Bill Evjen, Scott Hanselman & Devin Rader, Wiley Publication, 2009.
3. ***Programming Microsoft ASP.NET4,*** Dino Esposito, Dream Tech press, 2011.
4. ***The Complete Reference ASP.NET***, Matthew MacDonald, Tata McGrow Hill Education Pvt Ltd, 2012.

NEW

5%

III B.Sc. Computer Science

SEMESTER –V

For those who joined in 2018 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
UACS	B5SB4	Internet Programming - Paper IV Server Side Programming using ASP.Net	Skill Based Elective	2	2

COURSE DESCRIPTION

Server Side Programming using ASP.NET contains Introduction to .NET FrameWork3.5, Web Forms – Standard Controls and Navigation Controls, Validation Controls and Fundamentals of ADO.NET and basic SQL Commands.

COURSE OBJECTIVES

- To Understand NET framework and Web Forms using Standard Controls and Navigation Controls.
- To Understand Input Validation Controls
- To demonstrate data binding features and advanced data controls to create web pages that integrate attractive, customizable data displays.
- To Understand the fundamental of ADO.NET and use basic

SYLLABUS

UNIT I: INTRODUCTION TO .NET FRAMEWORK (6 Hrs)

Introduction to .NET FrameWork3.5 and Visual Studio 2008 *:* Introduction - Version of .NET FrameWork – Benefits of .NET Frame Work- Architecture of .NET Frame Work – Components of .NET FrameWork – Introducing Visual Studio 2008- New Features of Visual Studio 2008 - Installing Visual Studio 2008 - Visual Studio 2008 IDE- Developing Visual Studio 2008 Applications.

UNIT II: WEB FORMS (6 Hrs)

Web Forms: Standard Controls: Introduction – Control Class Using Label Control – Using TextBox Control – Using Button Control –Using ListBox Control – Using RadioButton Control.

UNIT III: NAVIGATION CONTROLS (6 Hrs)

Web Forms: Navigation Controls: Introduction to Navigation Controls – SiteMapPath Control – Using SiteMapPath Control, Customizing Appearance of the SiteMapPath Control – Menu Control, TreeView Control.

UNIT IV: BASE VALIDATION CLASS (6 Hrs)

Web Forms: Base Validation Class: Introduction – The Base Validator Class- Using RequiredFieldValidator Control – Using RangeValidator Control – Using RegularExpression Validator Control – Using CompareValidator Control – Using CustomValidator Control – Using ValidationSummary Control. Login Controls: Introduction to Login Controls – Using Login Control – Login View Control – Login Name Control – Using Login Name Control- Login Status Control -Password Recovery Control, Configuring the web.config file for Password Recovery.

UNIT V:WORKING WITH ADO.NET (6 Hrs)

Working with ADO.NET – Introduction – Basic SQL Statements –SELECT – DELETE – UPDATE – WHERE Clause – BETWEEN Clause – IN Clause – LIKE Clause -DISTINCT Clause – ORDERBY Clause –AS Clause GROUP BY Clause – HAVING Clause. Introducing ADO.NET– New Features in ADO.NET – Components of ADO.NET - basic operation in ADO.NET – Creating a Connection to Data Base – Executing Commands by using the Command objects – Adding and configuring a data adaptor Creating a DataSet – Using Data Adapter to retrieve data in a DataSet. Implementing Data Binding – Introduction – Types of Data Binding - Using GridView Control – DataList Control – Details View Control – FormView Control

SELF STUDY: DYNAMISM :(For CIA Only)

UNIT III: Introduction to Navigation Controls – SiteMapPath Control

UNIT IV: Login Status Control -Password Recovery Control, Configuring the web.config file for Password Recovery

TEXT BOOK

Comdex .NET 3.5 Programming Course Kit,Vikas Gupta &Kogent Solutions Inc., Dreamtech Press, Reprint Edition 2008.

Chapters : 2 (in Introduction) 3, 4, 5, and 6 (in ASP.NET3.5) 6 and 7(in C# 2008)

REFERENCE BOOKS

1. ***Microsoft ASP.NET 3.5***, George Shepherd, PHI PvtLtd , 2008.
2. ***Professional ASP.NET 3.5 in C# & VB***, Bill Evjen, Scott Hanselman& Devin Rader, Wiley Publication, 2009.
3. ***Programming Microsoft ASP.NET4,*** Dino Esposito, Dream Tech press, 2011.
4. ***The Complete Reference ASP.NET***, Matthew MacDonald, Tata McGrow Hill Education Pvt Ltd, 2012.

OLD

2019 – 2020
III B.Sc. Computer Science - VI SEMESTER
SKILL BASED ELECTIVE
B6SB5 - Internet Programming Paper V :
SERVER SIDE PROGRAMMING USING PHP

HRS/WEEK: 2 **CREDITS: 2**

COURSE OUTCOMES

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

CO1: Explain fundamental concepts of PHP .
CO2: Identify and use array and array related functions
CO3: Design and Develop Form with PHP Code.
CO4: Develop File operations.
CO5: Demonstrate Data Manipulation commands in MYSQL

SYLLABUS

UNIT I : Building Blocks of PHP and Functions **(6 Hrs)**

The Building Blocks of PHP: Variables – Data Types – Operators and Expressions – Constants. Flow Control Functions in PHP: Switching flow – Loops – Code Blocks and Browser and Output. Working with Functions: What is a function – Calling Functions – Defining a Functions – Returning values from User – Defined Functions - Variable Scope – Saving State Between Function Calls with the static Statement – More about Arguments – Testing for the Existence of a Function.

UNIT II: Working with Arrays and Objects **(6 Hrs)**

Working with Arrays: What are Arrays – Creating Arrays – Some Array-Related Functions. Working with Strings, Dates and Time: Formatting Strings with PHP – Investigating Strings in PHP – Manipulating Strings in PHP – Using Date and Time Functions in PHP – Other String, Date, Time Functions.

UNIT III: Working with Forms **(6 Hrs)**

Working with Forms: Creating a Simple Input Form – Accessing form Input with user - Defined Arrays – Combining HTML and PHP Code on a Single Page.

UNIT IV: Working with Files **(6 Hrs)**

Working with Files and Directories: Including Files with include() – validating files – Creating and Deleting files – Opening a file for Writing, Reading or Appending – Reading from files – Writing or Appending to a File.

UNIT V: **Interacting with MYSQL** **(6 Hrs)**

Learning Basic SQL Commands: Learning the MYSQL Data Types – Learning the Table Creation Syntax – Using the INSERT command - Using the SELECT Command – Using WHERE in your Queries – Selecting from Multiple Tables – Using the UPDATE Command to Modify Records – Using the REPLACE Command – Using the DELETE Command – Frequently Used String Functions in MYSQL – Using Date and Time Functions in MYSQL.

TEXT BOOK

Sams Teach Yourself PHP, MYSQL and APACHE, Julie C.Meloni, 5th Edition, Pearson Education, 2012.
Chapters : 5, 6, 7, 8, 10, 13, 16

REFERENCE BOOKS

1. ***PHP 6***, Julie Meloni Matt Telles, Cengage Learning Publication, 1st Edition, 2008.
2. ***Web Data base Applications with PHP & MYSQL***, Hugh E.Williams David Lane, Shroff Publishers & Distributors Pvt. Ltd., 1st Edition, 2009.

NEW

III B.Sc. Computer Science 5%

SEMESTER –VI

For those who joined in 2018 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
UACS	B6SB5	Internet Programming - Paper V Server Side Programming using PHP	Skill Based Elective	2	2

COURSE DESCRIPTION

Server Side Programming using PHP consist of building block of PHP , functions , Arrays and Objects of PHP, Forms and Files, interactive with MYSQL.

COURSE OBJECTIVES

- To understand fundamental concepts of PHP.
- To implement array related functions.
- To understand and use Web form and File operations.
- To understand Data Manipulation Operations in MYSQL

SYLLABUS

UNIT I : BUILDING BLOCKS OF PHP AND FUNCTIONS (6 Hrs)

The Building Blocks of PHP: Variables – Data Types – Operators and Expressions – Constants. Flow Control Functions in PHP:Switching flow – Loops – Code Blocks and Browser and Output. Working with Functions: What is a function – Calling Functions – Defining a Functions – Returning values from User – Defined Functions - Variable Scope – Saving State Between Function Calls with the static Statement – More about Arguments – Testing for the Existence of a Function.

UNIT II:WORKING WITH ARRAYS AND OBJECTS (6 Hrs)

Working with Arrays: What are Arrays – Creating Arrays – Some Array-Related Functions. Working with Strings, Dates and Time: Formatting Strings with PHP – Investigating Strings in PHP – Manipulating Strings in

PHP – Using Date and Time Functions in PHP – Other String, Date, Time Functions.

UNIT III: WORKING WITH FORMS (6 Hrs)

Working with Forms: Creating a Simple Input Form – Accessing form Input with user - Defined Arrays – Combining HTML and PHP Code on a Single Page.

UNIT IV:WORKING WITH FILES (6 Hrs)

Working with Files and Directories: Including Files with include() – validating files – Creating and Deleting files – Opening a file for Writing, Reading or Appending – Reading from files – Writing or Appending to a File.

UNIT V: INTERACTING WITH MYSQL (6 Hrs)

Learning Basic SQL Commands: Learning the MYSQL Data Types – Learning the Table Creation Syntax – Using the INSERT command - Using the SELECT Command – Using WHERE in your Queries – Selecting from Multiple Tables – Using the UPDATE Command to Modify Records – Using the REPLACE Command – Using the DELETE Command – Frequently Used String Functions in MYSQL – Using Date and Time Functions in MYSQL.

SELF STUDY: DYNAMISM :(For CIA Only)

UNIT I: More about Arguments – Testing for the Existence of a Function.

UNIT IV: Validating files – Creating and Deleting files .

TEXT BOOK

Sams Teach Yourself PHP, MYSQL and APACHE, Julie C.Meloni, 5th Edition, Pearson Education, 2012.

Chapters : 5, 6, 7, 8, 10, 13, 16

REFERENCE BOOKS

1. ***PHP 6***, Julie Meloni Matt Telles, Cengage Learning Publication, 1st Edition, 2008.

2. ***Web Data base Applications with PHP & MYSQL***, Hugh E.Williams David Lane, Shroff Publishers & Distributors Pvt. Ltd., 1st Edition, 2009.

OLD

2019 – 2020
III B.Sc. Computer Science - VI SEMESTER
SKILL BASED ELECTIVE
B6SB6 - Internet Programming Paper VI:
WEB SERVICES DEVELOPMENT USING XML

HRS/WEEK: 2 **CREDITS: 2**

COURSE OUTCOMES

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

CO1: Define the Web Services that convert application into a Web-application
CO2: Analyze the differences between HTML and XML
CO3: Apply XML markup language for transferring data
CO4: Create and validate XML documents
CO5: Discuss Simple Object Access Protocol in detail

SYLLABUS

UNIT I: Introduction to Web Services **(6 Hrs)**

Introduction – Background - Services-Web Services - Web Services Application Opportunities.

UNIT II: Emergence of Web Services **(6 Hrs)**

Emergence of Web Services – Background - Server-side Architecture Progression – Client-side Architecture Progression – Service-oriented Architecture and Web Services.

UNIT III : Web Services Application Scenario **(6 Hrs)**

Web Services Application Scenario – Background - Web Services Hype and the Industry – Web Services and the Industry Acceptance.

UNIT IV : Extensible Markup Language **(6 Hrs)**

Extensible Markup Language - Background – History of Markup Language – What is XML – Validation of XML Data – Advanced XML – Document Constraining.

UNIT V: Simple Object Access Protocol **(6 Hrs)**

Simple Object Access Protocol – Background – What is SOAP – SOAP Interaction – SOAP Modelling – SOAP Binding.

TEXT BOOK

Web Services An Introduction, B.V Kumar, S.V. Subrahmanya, Tata McGraw-Hill Publishing Company Limited, New Delhi, 2009.
Chapters : 1- 5

REFERENCEBOOKS

1. ***Programming the World Wide Web,*** Robert W. Sebesta Pearson Published, 2012.
2. ***Xml and Web Services ,*** Ron Schmelzer, Pearson Published, 2013.
3. ***Web Technology,*** S.Padma Priya, Scitech Publications (India) Pvt.Ltd, 2013.

NEW

III B.Sc. Computer Science

SEMESTER –VI

5%

For those who joined in 2018 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
UACS	B6SB6	Internet Programming - Paper VI Web Services Development Using XML	Skill Based Elective	2	2

COURSE DESCRIPTION

Xml is used for designing the web pages in an application.xml means extensible markup language. The tags used in the language contain the content specific meaning.

COURSE OBJECTIVES

- To Know about Web Services that convert application into a Web-application
- To understand the differences between HTML and XML
- To understand XML as a markup language for transferring data
- To learn XML syntax and to create and validate XML documents

SYLLABUS

UNIT I: INTRODUCTION TO WEB SERVICES (6 Hrs)

Introduction – Background - Services-Web Services - Web Services Application Opportunities.

UNIT II: EMERGENCE OF WEB SERVICES (6 Hrs)

Emergence of Web Services – Background - Server-side Architecture Progression – Client-side Architecture Progression – Service-oriented Architecture and Web Services.

UNIT III : WEB SERVICES APPLICATION SCENARIO (6 Hrs)

Web Services Application Scenario – Background - Web Services Hype and the Industry – Web Services and the Industry Acceptance.

UNIT IV : EXTENSIBLE MARKUP LANGUAGE (6 Hrs)

Extensible Markup Language - Background – History of Markup Language – What is XML – Validation of XML Data – Advanced XML – Document Constraining.

UNIT V: SIMPLE OBJECT ACCESS PROTOCOL
(6 Hrs)

Simple Object Access Protocol – Background – What is SOAP – SOAP Interaction – SOAP Modelling – SOAP Binding.

SELF STUDY : DYNAMISM :(For CIA Only)

UNIT I : Web Services Application Opportunities

UNIT II : Emergence of Web Services

UNIT III : Web Services and the Industry Acceptance.

UNIT IV : Background – History of Markup Language

UNIT V: SOAP Modeling

TEXT BOOK

Web Services An Introduction, B.V Kumar, S.V. Subrahmanya, Tata McGraw-Hill Publishing Company Limited, New Delhi, 2009.

Chapters : 1- 5

REFERENCEBOOKS

1. ***Programming the World Wide Web,*** Robert W. Sebesta Pearson Published, 2012.
2. ***Xml and Web Services ,***Ron Schmelzer, Pearson Published, 2013.
3. ***Web Technology,***S.PadmaPriya, Scitech Publications (India)Pvt.Ltd, 2013.

Dr. G. GERMINE MARY
Associate Professor & Head
Department of Computer Science
Fatima College (Autonomous)
Madurai - 625 018