SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE

(AUTONOMOUS)

(Affiliated to Bharathidasan University)

(Accredited with "A" grade by NAAC | An ISO 9001:2015 Certified Institution)

SUNDARAKKOTTAI, MANNARGUDI – 614 016,

TAMILNADU, INDIA.

BACHELOR OF COMPUTER APPLICATIONS COURSE STRUCTURE UNDER CBCS

(For the candidates admitted in the academic year 2020-2021)

ELIGIBILITY: Those who have completed +2 examinations with Mathematics as one of the core subject

Semester	Part	Nature of the Course	Title of the Course	Instru. Hours/ Week	Credit	Exam Hours	Marks		Total
							Int.	Ext.	
I	I	Language Course (LC)-I- Tamil */Other Languages ** #	Ikkala Ilakkiam	6	3	3	25	75	
	II	English Language Course (ELC)-I	Language through Literature I (Prose and Communication Skills)	6	3	3	25	75	100
	III	Core Course (CC) - I	Programming in C	6	5	3	25	75	100
		Core Practical (CP) - I	Programming in C Lab	3	2	3	40	60	100
		Allied Course (AC) – I	Algebra and Calculus	4	3	3	25	75	100
		Allied Course (AC)-II	Numerical Analysis	3	2	3	25	75	100
	IV	Value Education	Value Education	2	2	3	25	75	100
			Total	**30**	**20**	-	-	-	**700**
II	I	Language Course (LC)-II- Tamil */Other Languages ** #	Idaikkala Ilakkiyamum Pudhinamum	6	3	3	25	75	100
	II	English Language Course (ELC) – II	Language through Literature II (Poetry and Communication Skills)	6	3	3	25	75	100
	III	Core Course (CC) – II	Object Oriented Programming using C++	6	5	3	25	75	100
		Core Practical (CP)– II	Object Oriented Programming using C++ Lab	3	2	3	40	60	100
		Allied Course (AC) – III	Statistics	3	2	3	25	75	100
		Allied Course (AC)– IV	Operations Research	4	3	3	25	75	100
	IV	Environmental Studies	Environmental Studies	2	2	3	25	75	100
			Total	**30**	**20**	-	-	-	**700**
III	I	Language Course (LC)-III- Tamil */Other Languages ** #	Kappiyamum Naadakamum	6	3	3	25	75	100
	II	English Language Course (ELC) – III	Language through Literature III (Drama and Communication Skills)	6	3	3	25	75	100
	III	Core Course (CC) – III	Java Programming	6	5	3	25	75	100
		Core Practical (CP) – III	Java Programming Lab	3	2	3	40	60	100
		Allied Course (AC) – V	Principles of Accounting	4	3	3	25	75	100
		Allied Course (AC) – VI	Organizational Behaviour	3	2	3	25	75	100
		Non Major Elective I*	Non Major Elective I	2	2	3	25	75	100
			Total	**30**	**20**	-	-	-	**700**

Semester	Part	Nature of the Course	Title of the Course	Instru. Hours/ Week	Credit	Exam Hours	Marks		Total
							Int.	Ext.	
IV	I	Language Course (LC)-IV- Tamil */Other Languages ** #	Sanga Illakkiyam	6	3	3	25	75	100
	II	English Language Course(ELC) – IV	Language through Literature IV (Short Stories and Communication Skills)	6	3	3	25	75	100
	III	Core Course (CC) – IV	Database Systems	5	5	3	25	75	100
		Core Practical (CP) –IV	Database Systems Lab	3	2	3	40	60	100
		Allied Course (AC)– VII	Computer Applications in Business	3	3	3	25	75	100
		Allied Practical – I	Computer Applications in Business Lab	3	2	3	40	60	100
	IV	Non Major Elective II+	Non Major Elective II	2	2	3	25	75	100
		Skill Based Elective (SBE) – I	Skill Based Elective – I	2	2	3	25	75	100
			Total	**30**	**22**	-	-	-	**800**
V	III	Core Course (CC) –V	Data Structures and Algorithms	5	5	3	25	75	100
		Core Course (CC) – VI	Operating System Concepts	5	5	3	25	75	100
		Core Course (CC) –VII	Programming using PHP	5	5	3	25	75	100
		Core Practical (CP) –V	PHP Lab	5	4	3	40	60	100
		Major Based Elective (MBE)–I	Digital Computer Fundamentals / Fundamentals of Software Engineering / Fundamentals of big data Analytics	5	5	3	25	75	100
	IV	Skill Based Elective (SBE) – II	Skill Based Elective - II	2	2	3	25	75	100
		Skill Based Elective (SBE) –III	Skill Based Elective – III	2	2	3	25	75	100
		Soft Skills Development	Soft Skills Development	2	2	3	25	75	100
			Total	**31**	**30**	-	-	-	**800**
VI	III	Core Course (CC) –VIII	Computer Networks	6	6	3	25	75	100
		Core Course (CC) – IX	Programming using Python	6	6	3	25	75	100
		Core Practical (CP) –VI	Python Programming Lab	5	4	3	40	60	100
		Major Based Elective (MBE) – II	Cloud Computing Technology/ Mobile Applications Development/ Data Science using R	5	5	3	25	75	100
		Project	Project work	6	5	3	25	75	100
	IV	Extension Activities	Extension Activities	-	1	-	-	-	-
		Gender Studies	Gender Studies	1	1	3	25	75	100
			Total	**29**	**28**	-	-	-	**600**
			Grand Total	**180**	**140**	-	-	-	**4300**

CURRICULAM DESIGN

Allied Subject I: Mathematics **Allied Subject II:** Accounting and Organizational Behavior

Subject	No. of Courses	Total Credits
Language Part – I	4	12
English Part – II	4	12
Core Course	9	47
Core Practical	6	16
Allied Course	7	18
Allied Practical	1	2
Non-Major Electives	2	4
Skill Based Elective	3	6
Major Based Electives	2	10
Project	1	5
Environmental Studies	1	2
Value Education	1	2
Soft Skill Development	1	2
Gender Studies	1	1
Extension Activities	-	1
Total	**43**	**140**

* For those who studied Tamil upto 10^{th} +2 (Regular Stream)

those who studied Tamil upto 10^{th} +2 but opt for other languages in degree level under Part I should study special Tamil in Part IV

** Extension Activities shall be outside instruction hours

$^{+}$ NME courses are offered to other Under Graduate programmes. For BCA programme, NME courses of other department are offered.

Note:

	CIA	ESE
1. Theory	25	75
2. Practical	40	60

3. Separate passing minimum is prescribed for Internal and External marks

FOR THEORY

- The passing minimum for CIA shall be 40% out of 25 marks [i.e. 10 marks]
- The passing minimum for ESE shall be 40% out of 75 marks [i.e. 30 marks]

FOR PRACTICAL

- The passing minimum for CIA shall be 40% out of 40 marks [i.e. 16 marks]
- The passing minimum for ESE shall be 40% out of 60 marks [i.e. 24 marks]

NON MAJOR ELECTIVE (NME) OFFERED BY THE DEPARTMENT

Semester	Part	Course	Course Title
III	IV	NME –I	Fundamentals of Information Technology
IV		NME -II	World Wide Web Using HTML

SKILL BASED ELECTIVE (SBE) OFFERED BY THE DEPARTMENT

Semester	Part	Course	Course Title
IV	IV	SBE-I	Computer System Assembly and Troubleshooting
V		SBE-II	MS Office Tools
V		SBE-III	Desktop Publishing Tools

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QUESTION PAPER PATTERN

BACHELOR OF COMPUTER APPLICATIONS

(For the candidates admitted in the academic year 2020–2021)

Max. Time: 3 Hours **Max. Marks: 75**

SECTION – A (10 x 2 =10 Marks)
Answer ALL questions in Two Sentences Each

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

* Two questions from each unit

SECTION – B (5 x 5 = 25 Marks)
Answer ALL the Questions in Short

11. a.
    (OR)
    b.
12. a.
    (OR)
    b.
13. a.
    (OR)
    b.
14. a.
    (OR)
    b.
15. a.
    (OR)
    b.

* One question from each unit, with Internal choice

SECTION – C (3 x 10 = 30 Marks)
Answer any THREE questions in Detail

16.
17.
18.
19.
20.

*One question from each unit

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DEPARTMENT OF COMPUTER APPLICATIONS

BACHELOR OF COMPUTER APPLICATIONS (BCA)

Semester: III-CC-III: Java Programming

Ins. Hrs./Week: 6 **Course Credit:** 5 **Course Code: 20CA305**

OBJECTIVES

- To understand the concepts of Object Oriented Programming
- To write and execute java programs
- To understand the programming development processes

UNIT-I:Introduction of OOP **(18 Hours)**

ObjectOrientedProgramming:IntroductiontoOOP–ObjectsandClasses–Characteristics of OOP – Difference between OOP and Procedure Oriented Language –Introduction to java Programming : Introduction – Features of Java – Comparing java and Other Languages – Applications and Applets – Java Development Kit – Complex Programs – Java Source File Structure–Prerequisites for Compiling and Running Java Program.

UNIT- II: Java Language Fundamentals **(18 Hours)**

The Building Blocks of Java – Lexical Tokens –Data Types– Variable Declarations – Object Reference Variable – Default Members For Member Variables – Initializing Local Reference Variables – Wrapper Classes – Operators and Assignment – Control Structures – Branching Statement –Arrays – One Dimensional Arrays – Two Dimensional Array –Strings– String Buffer Classes.

UNIT- III: Packages and Interfaces **(18 Hours)**

Java as an OOP Language: Defining Classes– Passing Arguments to Methods – Overloading Methods – Overriding Methods –Finalizer Methods –Modifiers– Method Protection and Inheritance – Finalizing Classes –Packages– The import Command –Creating Packages – Packages and Class Protection –Interfaces – Defining an Interface – Extending Interface – Implementing Interface – Other Uses of Interface.

UNIT- IV: Exception Handling and Thread **(18 Hours)**

ExceptionHandling:Introduction–BasicsofExceptionHandling–ExceptionHierarchy – Constructors and Methods in Throwable Class- Unchecked and Checked Exceptions – Handling Exceptions in Java – Exception and Inheritance – Throwing User-defined Exceptions – Redirecting and Rethrowing Exceptions – Advantages of Exception Handling Mechanism – Multithreading : Introduction – Creating Threads –Thread Life-cycle– Thread Priorities and Thread Scheduling– Thread Synchronization.

UNIT-V:Files, I/O Streams and Applet **(18 Hours)**

Overview – Java I/O – File Streams – FileInputStream andFileOutputStream– FileStreams–RandomAccessFile–Serialization–Applets:Introduction– Java Applications versus Java Applets – Applet Life cycle – WorkingwithApplets– TheHTMLAPPLETTag– Attributes in Applet Tag – Passing Parameter to Applets – Running Applet Using AppletViewer– Running Applet Using Web Browser.

Total Lecture Hours: 90

COURSE OUTCOME

Students will be able to

1. Understandthe java programmingconcepts
2. Develop programsusingjavaprogramminglanguageconstructs
3. CreateUser-Definedfunctions
4. ImplementadvanceconceptssuchasApplet
5. ImplementtheconceptofFile Stream

TEXT BOOK(S)

1. Radha Krishna, P.2017. Object OrientedProgramming through Java.First Edition, Delhi UniversityPress.
2. Rizwan Ahmed .P. 2017. Java Programming. Margham Publications, Chennai.

REFERENCE BOOK(S)

1. Cay S.Horstmann. 2020. Core Java Volume-I Fundamental. Eleventh Edition, Pearson Publication.
2. Ken Arnold,James Gosling, David Holmes. 2007. The Java Programming Language. Third Edition,Pearson Publication.
3. Muthu C. 2006. Essential of Java Programming. Second Edition, Vijay Nicole imprints Private Limited, Chennai.
4. Somasundaram K. 2006. Programming in Java. First Edition, Jaico Publications House,Chennai.
5. Steven Haines. 2001. Java 2 from Scratch.First Edition, Prentice Hall of India,New Delhi.

E-RESOURCES

1. https://www.tutorialspoint.com
2. https://www.codecademy.com/learn/learn-java
3. https://www.learnjavaonline.org
4. https://examples.javacodegeeks.com/core-java/net/url/java-net-url-example
5. https://docs.oracle.com/javase/7/docs/api/java/net/URL.html

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DEPARTMENT OF COMPUTER APPLICATIONS

BACHELOR OF COMPUTER APPLICATIONS (BCA)

Semester: III-CP-III: Java Programming Lab

Ins. Hrs./Week: 3 **Course Credit:** 2 **Course Code: 20CA306P**

OBJECTIVES

- Todemonstrateprogramming conceptsusing Java programming language
- To write and compile java programs
- Toimplementadvanced concepts in Java programming language

LIST OF PROGRAMS

1. Writeaprogramtosortthe givennumbers usingarrays.
2. WriteaprogramtoimplementtheFINDandREPLACEoperationsinthe givenmultiple text.
3. Writeaprogramtoimplementacalculatortoperform basicArithmetic Operations.
4. Writeaprogramto findthe areaofa rectangleusingconstructor.
5. Write a program to find the student's percentage and grade using commandLinearguments.
6. Writeaprogramto drawcircleor triangle or square using polymorphismandinheritance.
7. Implement multiple inheritance concepts in java using interface, you can chooseyourownexampleofacompanyoreducationinstitutionorageneral concept which requires the use of interface to solve particular problems.
8. Writeaprogramtocreatethreadsandassignprioritiestothem.
9. Writeaprogramto insert image using Applet and develop animation.
10. Writeaprogramtocreateawindowwiththreecheckboxescalledred,Greenand blue. Theappletshouldchangethecolorsaccordingtotheselection.

Total Lab Hours- 45

COURSE OUTCOME

Students will be able to

1. Understand the java programming concepts by writing simple programs
2. Write programs using java programming language constructs
3. Implement User-Defined functions
4. Write programs to implement advance concepts such as Applet
5. Implement the concept of File Streams

REFERENCE BOOK(S)

1. Radha Krishna, P. 2017. Object Oriented Programming through Java.First Edition, Delhi University Press.
2. Rizwan Ahmed .P. 2017. Java Programming. Margham Publications, Chennai.
3. Cay S.Horstmann. 2020. Core Java Volume-I Fundamental. Eleventh Edition, Pearson Publication.
4. Ken Arnold,James Gosling, David Holmes. 2007. The Java Programming Language. Third Edition,Pearson Publication.
5. Somasundaram K. 2006. Programming in Java. First Edition, Jaico Publications House,Chennai.

E-RESOURCES

1. https://www.tutorialspoint.com
2. https://www.codecademy.com/learn/learn-java
3. https://www.learnjavaonline.org
4. https://examples.javacodegeeks.com/core-java/net/url/java-net-url-example
5. https://docs.oracle.com/javase/7/docs/api/java/net/URL.html

Semester: IV-CC-IV: Database Systems

Ins. Hrs./Week: 5 **Course Credit:** 5 **Course Code: 20CA407**

OBJECTIVES

- To understand the fundamental elements of relational database management systems and Entity-Relationship model
- To know the basic concepts of Relational database design, relational data model, and advanced SQL
- To understand theprogramming with SQL, object oriented relational data bases and normalization and distributed data bases

UNIT- I: Introduction (15 Hours)

Databases and Database Users –Database System Concepts –Database System Architecture – Data Modeling–Using the Entity-Relationship (ER) Model–The Enhanced Entity-Relationship (EER) Model.

UNIT- II: The Relational Data Model and SQL (15 Hours)

The Relational Data Model and Relational Database Constraints –Basic SQL –More SQL: Complex Queries, Triggers, Views, and Schema Modification –The Relational Algebra and Relational Calculus –Relational Database Design by ER and EER-to-Relational Mapping.

UNIT- III: Database Programming Techniques (15 Hours)

Introduction to SQL Programming Techniques –Web Database Programming Using PHP – Object and Object –Relational Databases.

UNIT- IV: Normalization (15 Hours)

Database Design Theory and Normalization –Basics of Functional Dependencies and Normalization for Relational Databases –Relational Database Design Algorithms and Further Dependencies.

UNIT V: Distributed Databases, NoSQL Systems, and Big Data (15 Hours)

Distributed Database Concepts –NoSQL Databases and Big Data Storage Systems –Big Data Technologies Based on MapReduce and Hadoop.

Total Lecture Hours- 75

COURSE OUTCOME

Students will be able to

1. Describe the database management systems, basic concepts of relational data model, entity-relationship model, and relational database design, ER-models to represent simple database application scenarios
2. Explain relational algebra and SQL
3. Explain aggregate functions of SQL, insert, delete and programming with SQL
4. Know about QBE and QUEL databases data integrity, and security
5. Understand about distributed databases, and mobile databases

TEXT BOOK(S)

1. ElmasriRamez, NavatheShamkant.2017. Fundamentals of Database System. Seventh Edition, Pearson Education, New Delhi.
2. Henry F. Korth, and Abraham Silberschatz,Sudarshan.2002. Database system Concepts. Fifth Edition, McGraw Hill, New Delhi.

REFERENCE BOOK(S)

1. Alexis Leon, Mathews Leon. 1999.Database Management system. Leon Press, Chennai and Vikas publishing house Pvt. Ltd. New Delhi.
2. DateC.J.1995. An Introduction to Database Systems. Sixth Edition, Addison Wesley USA.
3. ElmasriRamez, NavatheShamkant.2013. Database systems: Models, Languages, Design and Application Programming.Sixth Edition, Pearson publication. New Delhi.
4. Mark L. Gillenson. 2008.Fundamentalsof Database Management Systems. Second Education, Wiley India Pvt. Ltd.Bangalure.
5. Pipin C Desai. 1991.An Introduction to database systems. Galgotia Publications Private Limited, New Delhi.

E-RESOURCES

1. https://www.auhd.site/upfiles/elibrary/Azal2020-01-22-12-28-11-76901.pdf
2. https://www.philadelphia.edu.jo/newlibrary/pdf/file41eb4d56cf4142a3964cc15d68c5cadd.pdf
3. https://mucse44.net/wp-content/uploads/2019/09/Database-System-Concepts-7th-Edition.pdf
4. https://people.inf.elte.hu/miiqaai/elektroModulatorDva.pdf
5. https://mrcet.com/downloads/digital_notes/ECE/III%20Year/DATABASE%20MANAGEMENT%20SYSTEMS.pdf

Semester: IV-CP-IV: Database Systems Lab

Ins. Hrs./Week: 3 **Course Credit:** 2 **Course Code: 20CA408P**

OBJECTIVES

- To write queries in MySQL
- To implement Basic SQL Operations
- To understand SQL Aggregate functions, set functions, join operations, nested subqueries, views and pattern matching operation on strings

LIST OF PROGRAMS

1. Create a table and perform the following basic MySQL operations

a. Set the primary key
b. Alter the structure of the table
c. Insert values
d. Delete values based on constraints
e. Display values using various forms of select clause
f. Drop the table

2. Develop MySQL queries to implement the following set operations

a. Union
b. Union all
c. Intersect
d. Intersect all

3. Develop MySQL queries to implement the following aggregate functions

a. Sum
b. Count
c. Average
d. Maximum
e. Minimum
f. Group by clause & having clause

4. DevelopMySQL queries to implement following join operations

a. Natural join
b. Inner join
c. Outer join-left outer, right outer, full outer
d. Using join conditions

5. Develop MySQL queries to implement nested subqueries

a. Set membership (In, Not In)
b. Set comparison (some, all)
c. Empty relation (exists, not exists)
d. Check for existence of Duplicate tuples (unique, not unique)

6. Develop MySQL queries to create views and expand it

7. Develop MySQL queries to implement

a. String operations using %
b. String operations using '_'
c. Sort the element using asc, desc [*create necessary relations with requires attribute]

8. Consider the following database for a banking enterprise

a. BRANCH(branch-name: string, branch-city: string, assets: real)
b. ACCOUNT(accno: int, branch-name: string, balance: real)
c. DEPOSITOR(customer-name: string, accno: int)
d. CUSTOMER(customer-name: string, customer-street: string, customercity: string)
e. LOAN(loan-number: int, branch-name: string, amount: real)
f. BORROWER(customer-name: string, loan-number: int)
   - ✓ Create the above tables by properly specifying the primary keys and the foreign keys
   - ✓ Enter at least five tuples for each relation
   - ✓ Find all the customers who have at least two accounts at the Main branch.
   - ✓ Find all the customers who have an account at all the branches located in a specific city.
   - ✓ Demonstrate how you delete all account tuples at every branch located in a specific city.
   - ✓ Generate suitable reports.
   - ✓ Create suitable front end for querying and displaying the results.

Total Lab Hours- 45

COURSE OUTCOME

Students will be able to

- Create tables, insert values and do all the DDL Functions in SQL using MySQL
- Manipulate table values using aggregate functions, set operations, nested subqueries and string manipulation functions
- Develop big data base with number of tables using constraints
- Develop MySQL queries
- Apply in real-time applications

REFERENCE BOOK(S)

1. ElmasriRamez, NavatheShamkant.2017. Fundamentals of Database System. Seventh Edition, Pearson Education, New Delhi
2. Henry F. Korth, and Abraham Silberschatz, Sudarshan.2002. Database system Concepts. Fifth Edition, McGraw Hill, New Delhi
3. Anthony Molinaro. 2005.SQL Cookbook.First Edition, O'Reilly media, USA.
4. John Russel. 2020.SQL: 2 Books in 1: Beginner's Guide & 7-Day Crash Course, How to Quickly Learn Structured Query Language Programming, Server Administration, Computer and Database Management Step-by-Step". Kindle Edition, self-publication.
5. John Viescas and Michael J. Hernandez. 2000.SQL Queries for Mere Mortals: A Hands-on Guide to Data Manipulation in SQL.Second Edition, self-publication.

Semester: V-CC-V: Data Structures and Algorithms

Ins. Hrs./Week: 5 **Course Credit:** 5 **Course Code: 20CA509**

OBJECTIVES

- To understand basic concepts of Data structures and Algorithms
- To understand the concepts of Linked List
- To understand the Binary tree representations, Sorting and Greedy Concepts

UNIT-I: Arrays and Linked List (15 Hours)

Arraysand sequential representations– Sparse Matrices – Representation of Arrays – Orderedlists–StacksandQueues–Evaluation of Expressions–MultipleStacksandQueues– SinglyLinkedList–Linked Stacks andqueues–Polynomial addition – Doubly Linked List and Dynamic Storage Management.

UNIT-II: Tree and Graphs (15 Hours)

Trees – Binary tree representations – Tree Traversal – Threaded Binary Trees– BinaryTreeRepresentation of Trees – Graphs and Representations – Traversals,ConnectedComponentsandSpanningTrees– ShortestPathsandTransitiveclosure–ActivityNetworks–TopologicalSortandCriticalPaths.

UNIT-III: Sorting and Searching (15 Hours)

Searching – Insertion Sort –Quick Sort– Priority Queues - Heaps – Heap Sort – Merge Sort –BinarySearch–Techniques for Binary Trees – Techniques for Graph – Breath First Search – Depth First Search – Connected Components and Spanning Trees – FindingtheMaximumandMinimum.

UNIT-IV:Greedy Method (15 Hours)

Greedy Method: The General Method – Knapsack Problem – Tree Vertex Splitting – Job Sequencing with Deadlines – Minimum Cost Spanning Trees–Kruskal's Algorithms – An Optimal Randomized Algorithms – Optimal Storage on Tapes –Optimal Merge Patterns – Single-Source Shortest Paths.

UNIT V:Backtracking (15 Hours)

Backtracking: TheGeneralMethod– Various Examples using Backtracking –The8-QueensProblem–SumofSubsets– Sum of Subsets Algorithms –GraphColoring– Graph Coloring Algorithms – Hamilton Cycles – Hamilton Cycle Algorithm – Knapsack Problem using Backtracking.

Total Lecture Hours- 75

COURSE OUTCOME

Students will be able to

1. Define Data structures and Algorithms concepts
2. Create Linked List
3. Implement Binary tree representations
4. Implement Sorting Method
5. Implement Greedy Method

TEXT BOOK(S)

1. Ellis Horowitz, SartajSahni. 2008. FundamentalsofDataStructure. Second Edition, Galgotia Publications, New Delhi.
2. Ellis Horovitz, SartajSahni and SanguthevarRajasekaran. 2008. Second Edition, Computer Algorithms. UniversityPress (India) Pvt. Ltd., Hyderabad.

REFERENCE BOOK(S)

1. AdityaBhargava. 2016. An Illustrated Guide for Programmer for Algorithms. First Edition, Manning Publications, USA.
2. Jon Kleinberg, Eva Tardos. 2005. Algorithms Design. First Edition, Pearson Publications, UK.
3. SeymourLipschutz. 2014. DataStructures (Schaum'sOutlineSeries).Second Edition, TataMcGraw-Hill,New Delhi.
4. StevenS.Skiena. 2021. The Algorithms Design Manual. Third Edition, Edition,Springer Publications, New York, USA.
5. Thomas HCormen,Charles ELeiserson, Ronald L Rivest, Clifford Stein. 1989. Introduction to Algorithms. First Edition, MIT Press, Cambridge, USA.

E-RESOURCES

1. https://www.tutorialspoint.com/data_structures_algorithms
2. https://discuss.codechef.com/t/data-structures-and-algorithms
3. https://www.geeksforgeeks.org/how-to-design-a-tiny-url-or-url-shortener
4. https://people.mpi-inf.mpg.de/~mehlhorn/ftp/Mehlhorn-Sanders-Toolbox.pdf
5. https://www.cs.usfca.edu/~galles/visualization/Algorithms.html

Semester: V-CC-VI: Operating System Concepts

Ins. Hrs./Week: 5 **Course Credit:** 5 **Course Code: 20CA510**

OBJECTIVES

- To know the Fundamental Concepts in an Operating System
- To comprehend different approaches of Management in Operating System
- To understand the structure of the File System

UNIT- I:Introducing Operating Systems (10 Hours)

Introduction – What Is an Operating System? –Operating System Software – An Evolution of Computing Hardware – Types of Operating Systems –Brief History of Operating System Development– Design Considerations.

UNIT- II:Memory Management (18 Hours)

Single-User Contiguous Scheme –Fixed Partitions –Dynamic Partitions –Best-Fit versus First-Fit Allocation –Deallocation–Relocatable Dynamic Partitions. Virtual Memory: Paged Memory Allocation –Demand Paging –Page Replacement Policies and Concepts –Segmented Memory Allocation –Segmented/Demand Paged Memory Allocation – Virtual Memory –Cache Memory.

UNIT- III:Processor Management (17 Hours)

Overview – Definitions –About Multi-Core Technologies – Scheduling Submanagers– Process Scheduler – Scheduling Policies –Process Scheduling Algorithms –Managing Interrupts – Deadlock,Livelock,and Starvation –Deadlock –Starvation – Concurrent Processes: What Is Parallel Processing?–Typical Multiprocessing Configurations –Process Synchronization Software.

UNIT- IV:Device Management (15 Hours)

Types of Devices: Management of I/O Requests – I/O Devices in the Cloud –Sequential Access Storage Media –Direct Access Storage Devices–Magnetic Disk Storage – Optical Disc Storage – Solid State Storage –Components of the I/O Subsystem – Communication among Devices – RAID.

UNIT- V:File Management (15 Hours)

The File Manager –Interacting with the File Manager –File Organization – Physical Storage Allocation –Access Methods –Levels in a File Management System – Access Control Verification Module – Data Compression.

Total Lecture Hours- 75

COURSE OUTCOME

Students will be able to

1. Describe the basic concepts of Computer Operating Systems
2. Understand the process management policies and scheduling of processes by CPU
3. Describe and analyze the memory management and its allocation policies
4. Identify use and evaluate the storage management policies with respect to different storage management technologies
5. Identify the need to create the special purpose operating system

TEXT BOOK(S)

1. AnnMclverMcHoes and Ida M Flynn. 2014,Understanding Operating Systems.Seventh Edition, Cengage Learning, USA.

REFERENCE BOOK(S)

1. Abraham Silberschatz, Greg Gagne, Peter B. Galvin. 2018. Operating System Concepts.Tenth Edition, John Wiley & Sons,Hoboken, New Jersey, USA.
2. Achyut S Godbole and AtulKahate. 2010.Operating Systems.Third Edition, Tata McGraw-Hill Education Private Ltd, NewDelhi.
3. Charles Patrick Crowley. 1996. Operating System: A Design Oriented Approach. Tata McGraw-Hill Education Private Ltd, New Delhi.
4. DhananjayM.Dhamdhere. 2012. Operating Systems: A Concept-Based Approach.Third Edition, Tata McGraw Hill Education Private Ltd, NewDelhi.
5. Gary Nutt,NabenduChaki,SarmisthaNeogy. 2014. Operating Systems. Third Edition, Pearson Publications, UK.

E-RESOURCES

1. https://www.geeksforgeeks.org/introduction-of-operating-system-set-1/
2. https://www.tutorialspoint.com/operating_system/os_memory_management.htm
3. https://www.tutorialspoint.com/operating_system/os_overview.htm
4. https://www.wgu.edu/blog/5-most-popular-operating-systems1910.html
5. https://www2.cs.uic.edu/~jbell/CourseNotes/OperatingSystems/1_Introduction.html

Semester: V-CC-VII: Programming using PHP

Ins. Hrs./Week: 5 **Course Credit:** 5 **Course Code: 20CA511**

OBJECTIVES

- To understand the basic concepts of PHP
- To understand the Concepts of Functions
- To understand the Concepts of Object Oriented Programming, and File handling

UNIT- I: Essential PHP **(15 Hours)**

Variables, Constants, Understanding Internal Data types in PHP – Operators and Flow Control: The String Functions and PHP Array Functions, Handling Multi-Dimensional Array.

UNIT- II: Functions and Reading Data **(15 Hours)**

Creating Functions in PHP:Variable scope in PHP– Reading Data in Webpages: Setting up Web Pages to communicate with PHP, Handling Form Input Elements– PHP Browser – Handling Power.

UNIT- III: OOPin PHP **(15 Hours)**

Object-Oriented Programming: Creating Classes, Objects, Constructor, Destructor, setting access to Properties and methods, Overriding and Overloading methods – Advanced Object-Oriented Programming.

UNIT- IV: Handling File and Databases **(15 Hours)**

File Handling:Opening, looping, writing, reading, closing, checking, parsing, Copying, appending, locking and deleting a file – Working with Databases and Using PHP with MYSQL: Connecting to MYSQL – Executing and retrieving Simple Queries.

UNIT- V: Cookie and Ajax **(15 Hours)**

Cookie: Reading, Setting, deleting and setting Cookie's expiration – Working with FTP – Session: Storing data in sessions, writing a Hit counter using sessions – Ajax – Advanced Ajax.

Total Lecture Hours- 75

COURSE OUTCOME

Students will be able to

1. Understand operators and controls in PHP
2. Understand Concept of Functions
3. Understand Object oriented programming
4. Understand using PHP with MySQL
5. Understand Ajax

TEXT BOOK(S)

1. Steven Holzner.2007. PHP:The Complete Reference.First Edition, McGraw Hill India, New Delhi.
2. Larry Ullman. 2017. PHP 6 and MySQL 5 for Dynamic websites: Visual Quick Pro Guide.Third Edition, Peachpit Press, San Francisco, USA.

REFERENCE BOOK(S)

1. Bruce Dou. 2020. Mastering Swoole PHP: Build High Performance Concurrent System with Async and Coroutines".First Edition, Transfon Ltd, UK.
2. Doug Bierer.2016. PHP 7 Programming Cookbook.First Edition, PacktPublishing, Mumbai.
3. Gunnard Engebreth.2021. PHP 8 Revealed.First Edition, First Edition, Apress Publications, USA.
4. Mikael Olsson. 2020. PHP 8 Quick Scripting Reference.Third Edition, Apress Publications, USA.
5. VikramVaswani. 2008. PHP:ABeginner'sGuide. First Edition, McGrawHillEducation, New Delhi.

E- RESOURCES

1. https://www.w3schools.com/php/DEFAULT.asp
2. https://www.tutorialspoint.com/php/index.html
3. http://www.nptelvideos.com/php/php_video_tutorials.php
4. https://www.tutorialspoint.com/php/index.htm
5. https://www.phptpoint.com

Semester: V-CP-V: PHP Lab

Ins. Hrs./Week: 5 **Course Credit:** 4 **Course Code: 20CA512P**

OBJECTIVES

- To understand the basic programming concepts PHP
- To understand the concept of cookie and session in PHP
- To write simple programs using PHP

LIST OF PROGRAMS

1. Writeaprogramtofindthefactorialofanumber.
2. WriteaprogramusingConditionalStatements.
3. Writeaprogramtofindthemaximumvalueinagivenmultidimensionalarray.
4. WriteaprogramtofindtheGCDoftwonumbersusinguser-definedfunctions.
5. Designasimplewebpagetogeneratemultiplicationtableforagivennumber.
6. Designawebpagethatshouldcomputeone'sageonagivendate.
7. Writeaprogramtodownloadafilefromtheserver.
8. Writeaprogramtostorethecurrentdateandtimeina COOKIE anddisplaythelastvisited dateandtimeonthewebpage.
9. WriteaprogramtostorepageviewscountinSESSION,to incrementthecountoneachrefreshandtoshowthecountonwebpage.
10. Writeaprogramtodrawthehumanface.
11. Writea program to design a simple calculator.
12. DesignanauthenticationwebpageinPHPwithMySQLtocheckusernameandpassword.
13. Create a web page in PHP for your personal details

Total Lab Hours- 75

COURSE OUTCOME

Students will be able to

1. Write programs using various operators and controls in PHP
2. Implement Functions
3. Develop programs to apply Object oriented programming concepts
4. Write programs in PHP with MySQL database
5. Design simple webpages

REFERENCE BOOK(S)

1. Steven Holzer. 2007. PHP: The Complete Reference. First Edition, McGraw Hill India, New Delhi.
2. Larry Ullman. 2017. PHP 6 and MySQL 5 for Dynamic websites: Visual Quick Pro Guide.Third Edition, Peachpit Press, San Francisco, USA.
3. Bruce Dou. 2020. Mastering Swoole PHP: Build High Performance Concurrent System with Async and Coroutines".First Edition, Transfon Ltd, UK.
4. Doug Bierer.2016. PHP 7 Programming Cookbook.First Edition, Packt Publishing, Mumbai.
5. Gunnard Engebreth.2021. PHP 8 Revealed.First Edition, First Edition, Apress Publications, USA.

E- RESOURCES

1. https://www.w3schools.com/php/DEFAULT.asp
2. https://www.tutorialspoint.com/php/index.html
3. http://www.nptelvideos.com/php/php_video_tutorials.php
4. https://www.tutorialspoint.com/php/index.htm
5. www.ideone.com

Semester: V-MBE-I:1: Digital Computer Fundamentals

Ins. Hrs./Week: 5 **Course Credit:** 5 **Course Code: 20MBECA1:1**

OBJECTIVES

- To understand the concepts in Digital Computer System
- To understand the concept of Logic gates and circuits
- To understand the counters and memory elements

UNIT-I:Number Systems and Codes (15 Hours)

Binary Number System – Binary to Decimal Conversion –DecimaltoBinaryConversion– BinaryAddition–BinarySubtraction–BinaryMultiplication and Division – Octal Numbers – Hexadecimal Numbers – Binary Codes –ErrorDetectingCodes–ErrorCorrectingCodes.

UNIT-II: Logic Gates and Circuits (15 Hours)

Boolean Algebra andLogic Gates– AND, OR,NOT, NAND,NOR,ExclusiveORandExclusiveORGates–Applicationsof XOR Gate – TheExclusive NOR Gate – Positive and Negative Logic – Logic Characteristics – BipolarLogic Families – Integrated Circuits – Boolean Algebra: Definitions – Fundamentals ofBoolean Algebra – Boolean Functions – Minterms and Maxterms – Laws and Theoremsof Boolean Algebra.

UNIT- III: Boolean Algebra (15 Hours)

BooleanAlgebra:SimplifyingLogicCircuits–Sum of Products – AND-OR Networks – SumofProductsandProductofSumsForms–KarnaughMaps–ProductofSumsSimplification–NAND and NOR Implementation–AND-OR-INVERT Implementation –OR-AND-INVERTImplementation–Don'tCareConditions – Overlapping Groups –RollingtheMap– EliminatingRedundantGroups.

UNIT- IV: Combinational Logic Circuits (15 Hours)

Introduction– Adders –TheHalfAdder– TheFull Adder– Subtractors – Binary-Coded Decimal (BCD) Adder – Multiplexers – Demultiplexers – Decoders – Encoders – FloatingPointNumberSystem–RangeofStoredNumbers.

UNIT- V: Sequential Logic Circuits (15 Hours)

Flip Flops– RS Flip Flop – Clocked RS Flip Flop – D Flip-flop – JK Flip Flop – T Flip Flop – Triggering of Flip Flops – Master Slave Flip Flop –Conversion of D Flip Flop – Conversion of T Flip Flop – Transfer Circuit – Clock –Counters and Shift Registers:Counters– AsynchronousorRippleCounter–RingCounter–TwistedRingCounter–State Diagrams and State Tables–MagnitudeComparator–ProgrammableArraysofLogicCells–ShiftRegisters–Memory Elements– RAM – ROM –Magnetic Disc Memories.

Total Lecture Hours-75

COURSE OUTCOME

Students will be able to

1. Understand number system
2. Understand logic gates
3. Understand combinational logic circuits
4. Understand Counters and Registers
5. Understand Memory Elements

TEXTBOOK(S)

1. K.Meena. 2009. Principlesofthe Digital Electronics.First Edition, PHILearningPrivateLimited,NewDelhi.

REFERENCEBOOK(S)

1. Anil K.Maini.2019. Digital Electronics: Principles, devices and applications.First Edition, Wiley Publishers, US.
2. Anand Kumar A.2016. Fundamentals of Digital Circuits. Fourth Edition, PHI Learning Private Limited, New Delhi.
3. DhanasekharanNatarajan. 2020. Fundamentals of Digital Electronics. Springer, Germany.
4. M Morris Mano. 2018. Digital Design. Sixth Edition, PearsonEducation, New Delhi.
5. Ronald J. Tocci,Neal S. Widmer, Gregory L Moss. 2019.Digital Systems Principles and Applications. Tenth Edition, Pearson Education, UK.

E-RESOURCES

1. https://pages.uoregon.edu/rayfrey/DigitalNotes.pdf
2. https://www.tutorialspoint.com/digital_circuits/index.htm
3. http://www.nptelvideos.in/2012/12/digital-circuits-and-systems.html
4. https://www.javatpoint.com/digital-electronics
5. https://www.geeksforgeeks.org/digital-electronics-logic-design-tutorials

Semester: V-MBE-I:2: Fundamentals of Software Engineering

Ins. Hrs./Week: 5 **Course Credit:** 5 **Course Code: 20MBECA1:2**

OBJECTIVES

- To understand the various phases of Software Engineering Process
- To know the concepts of Object Oriented software design
- To understand the concepts of Software testing

UNIT- I: Introduction (15 Hours)

Introduction to Software Engineering – Software Process – Software Process Models – Software Model– Requirements Engineering Principles : Requirements Engineering – Importance of Requirements – Types of Requirements – Steps involved in Requirements Engineering.

UNIT- II: Requirements Analysis Modeling (15 Hours)

Analysis Modeling Approaches – Structured Analysis –Object Oriented Analysis – Design and Architectural Engineering: Design Process and Concepts – Basic Issues in Software Design – Characteristics of Good Design – Software Design and Software Engineering – Function Oriented System versus Object Oriented System – Modularity, Cohesion, Coupling, Layering – Real Time Software Design – Design Models – Design Documentation.

UNIT- III: Object Oriented Concepts (15 Hours)

Fundamental Parts of Object Oriented Approach – Data Hiding and Class Hierarchy Creation – Relationships – Role of UML in OO Design – Design Patterns – Frameworks – Object Oriented Analysis – Object Oriented Design – User Interface Design: Concepts of User Interface – Elements of User Interface – Designing the User Interface – User Interface Evaluation – Golden Rules of User Interface Design – User Interface Models – Usability.

UNIT- IV:Software Coding, Software Project Management (15 Hours)

Software Coding – Introduction to Software Measurement and Metrics – Software Configuration – Project Management Introduction – Risk Analysis and Management – Communication and Team Management – Project Stake holder Management – Computer-aided Software Engineering.

UNIT- V: Software Testing (15 Hours)

Software Testing Fundamentals –Test Case Design–White-Box Testing – Basis Path Testing – Control Structure Testing –Black-Box Testing – Testing for Specialized Environment,Architectures and Applications – Software Testing Strategies: A Strategic Approach to Software Testing – Unit Testing – Integration Testing – Validation Testing – System Testing.

Total Lecture Hours- 75

COURSE OUTCOME

Students will be able to

1. Describe requirements of Software Engineering
2. Describe the Modeling Approaches
3. Explain n the Object Oriented Approach in software Engineering
4. Describe the concepts of software coding and software Testing
5. Understand Web Engineering Concepts

TEXTBOOK(S)

1. Chandramouli Subramanian, SaikatDutt, ChandramouliSeetharaman, B.G. Geetha. 2015. Software Engineering, First Editon, Pearson India EducationPvt. Ltd., New Delhi.
2. Roger S. Pressman. 2000. Software engineering: a practitioner's approach. Fifth Edition, McGraw-Hill Education, New York.

REFERENCE BOOK(S)

1. Frank Tsui, Orlando Karam. 2011. Essentials of Software Engineering, Second Edition, Jones and Bartlett Publishers,Burlington.
2. Rajib Mall. 2018. Fundamentals of Software Engineering.Fifth Edition, PHI Learning Private Limited,New Delhi.
3. Rod Stephens. 2015.Beginning Software Engineering. John Wiley& Sons Inc,India.
4. Ronald J.Leach. 2020. Introduction to Software Engineering, Second Edition,CRC Press, Florida, USA.
5. MilandG.Limaye. 2009. Software Testing: Principles,Techniques and Tools.First Edition, Tata McGraw-Hill Education, NewDelhi.

E-RESOURCES

1. https://en.wikipedia.org/wiki/Software_engineering
2. https://www.javatpoint.com/software-engineering-tutorial
3. https://www.geeksforgeeks.org/software-engineering/
4. https://www.castsoftware.com/glossary/what-is-software-engineering-definition-types-of-basics-introduction
5. https://nptel.ac.in/courses/106/105/106105087/

Semester: V-MBE-I:3: Fundamentals of Big Data Analytics

Ins. Hrs./Week: 5 **Course Credit:** 5 **Course Code: 20MBECA1:3**

OBJECTIVES

- To understand the concepts of big data Analytics
- To explain the big data framework, its characteristics and use cases associated with it
- To understand Hadoop framework

UNIT-I:Introduction to Big Data (15 Hours)

Characteristics of Data–Evolution of Big Data –Definition –Challenges –Elements –Why Big Data –Traditional Business Intelligence (BI) Versus Big Data –A Typical Data Warehouse Environment – A Typical Hadoop Environment Big Data Analytics –What is Big Data Analytics? –Terminologies used in Big Data Environment.

UNIT- II: Introduction to Hadoop (15 Hours)

Features of Hadoop–Advantages –Version –Introducing Hadoop– Why Hadoop–RDBMS Versus Hadoop–Distributed Computing Challenges–History of Hadoop–Hadoop Overview –Use Case of Hadoop–Hadoop Distributers.

UNIT-III:Hadoop Distributed File System (HDFS) and YARN (15 Hours)

The Design of HDFS –HDFS Concepts –The Command-Line Interface –Hadoop File Systems– The Java Interface–Data Flow -Parallel Copying with distcp- YARN–YARN Anatomy –YARN Compared toMapReduce 1 –Scheduling in YARN

UNIT-IV:Hadoop I/O and **MapReduce (15 Hours)**

Hadoop I/O –Data Integrity- Compression – Serialization – File-Based Data structures - MapReduce: Developing a MapReduce Applications – HowMapReduce Works –MapReduce Features.

UNIT-V:Advanced Analytics Technology and Tools (15 Hours)

Analytics for Unstructured Data –The Hadoop Ecosystem –NOSQL –End game: Communicating and Operationalizing an Analytics Project –Creating the Final Deliverables –Data Visualization Basics – Machine Learning with Spark and Hadoop : Introduction – Machine Learning on Spark and Hadoop – Machine learning algorithms –Example – Building Machine learning pipelines.

Total Lectures Hours- 75

COURSE OUTCOMES

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

1. Understand the characteristics of big data
2. Explore Hadoop framework and its components
3. Use HDFS and Map Reduce to analyze various industry use cases of big data analytics
4. Understand the YARN and MapReduceInfrastructure
5. Understand industry scenario of big data analytics

TEXT BOOK(S)

1. SeemaAcharya, SubhashiniChellappan.2019. Big Data and Analytics.Second Edition, Wiley India Pvt. Ltd, New Delhi.
2. Tom White. 2015.Hadoop: The Definitive Guide. Fourth Edition, O'Reilly Media Inc,Newton, USA.
3. EMC Education Services. 2015. Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data.First Edition, John Wiley & Sons, Inc. New Jersey, USA.
4. VenkatAnkam. 2016. Big Data Analytics. First Edition, Packt Publishing Ltd, UK.

REFERENCE BOOK(S)

1. Lakshmi Prasad Y. 2016. Big Data Analytics Made Easy.First Edition, Notion Press, Chennai.
2. Judith Hurwitz, Alan Nugent, Fern Halper, Marcia Kaufman. 2012. Big Data for Dummies. John Wiley&Sons Inc, Hoboken, New Jersey, USA.
3. Michael Minelli, Michele Chambers, AmbigaDhiraj. 2013. Big Data, BigAnalytics.John Wiley&Sons Inc, Hoboken, New Jersey, USA.
4. MayankBhushan. 2018. Big Data and Hadoop - Learn by Example.First Edition, BPB Publication, New Delhi.
5. Boris Lublinsky, Kevin T Smith, Alexey Yakubovich. 2013. Professional Hadoop Solutions. John Wiley&Sons Inc,Hoboken, New Jersey, USA.

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1. https://en.wikipedia.org/wiki/Big_data
2. https://towardsdatascience.com/big-data-integration-9a2fb2d78529
3. https://www.tutorialspoint.com/hadoop/index.htm
4. https://www.javatpoint.com/hadoop-tutorial
5. https://www.simplilearn.com › tutorials › big-data-tutorial

Semester: V-SD: Soft Skills Development

Ins. Hrs./Week: 2 **Course Credit:** 2 **Course Code: RUGSDC**

OBJECTIVES

- To understand about relationship, communication and presenting oneself, one's ideas and the company in the most positive and impactful way.
- To enable students to achieve excellence in both personal and professional life.

UNIT- I: Know thyself (6 Hours)

Understanding Self Introduction to Soft skills –Self-discovery–Developing positive attitude – Improving perceptions –Forming values.

UNIT- II: Interpersonal Skills (6 Hours)

Understanding Others Developing interpersonal relationship –Team building-group dynamics – Networking Improved work relationship.

UNIT- III: Communication Skills (6 Hours)

Communication with others Art of listening –Art of reading –Art of speaking –Art of writing – Art of writing e-mails –e mail etiquette.

UNIT- IV: Corporate Skills (6 Hours)

Working with Others – Developing body language –Practicing etiquette and mannerism –Time management–Stress management.

UNIT- V: Selling Self (6 Hours)

Job Hunting– Writing resume/CV –interview skills –Group discussion – Mock interview –Mock GD – Goal setting – Career planning.

Total Lecture Hours- 30

TEXT BOOK(S)

1. Meena K and V Ayothi. 2013. A Book on Development of Soft Skills (Soft Skills : A Road Map to Success), P.R. Publishers & Distributors, Tiruchirappalli.
2. Alex K. 2012. Soft Skills – Know Yourself& Know the World. S.Chand& Company LTD, New Delhi.

REFERENCE BOOK(S)

1. Developing the leader within you John c Maxwell
2. Good to Great by Jim Collins
3. The seven habits of highly effective people Stephen Covey
4. Emotional Intelligence Daniel Goleman
5. You can win ShiveKhera
6. Principle centred leadership Stephen Covey

Semester: VI-CC-VIII: Computer Networks

Ins. Hrs./Week: 6 **Course Credit:** 6 **Course Code: 20CA613**

OBJECTIVES

- To understand fundamental concepts of computer networking
- To know the terminology associated with computer networks
- To enumerate and explain the layers of OSI model and TCP/IP

UNIT- I: Introduction and Physical Layer (18 Hours)

Data Communications – Networks – Network Types–Internet History – Network Models: Protocol Layering,TCP/IP Protocol Suite,The OSI Model – Bandwidth utilization: Multiplexing – Spread Spectrum–Transmission Media: Guided Media, Unguided Media – Switching: Circuit Switched Network, Packet Switching, Structure of a switch.

UNIT-II:Data link, MAC Layer, LANs (18 Hours)

DataLinkLayer:Error Deduction and Correction: Introduction – Cyclic codes – Forward error correction, Data link Control: Datalink layer protocols – Media Access Control: Random Access – Controlled Access, Wireless LANS: Bluetooth –Cellular Telephony – Satellite networks – Connecting devices.

UNIT-III:Network Layer (18 Hours)

Network Layer Services: Packet Switching – Network layer performance – IPV4 Addresses – Internet Protocol –Routing Algorithms: Distance-Vector routing, Link-State routing, Path-Vector routing– IPV6 Addressing.

UNIT- IV: Transport Layer (18 Hours)

Transport Layer Protocols – User Datagram Protocol – TCP:TCP Services –TCP features – Segment – Windows in TCP – Flow Control – Error Control – TCP Congestion Control – TCP timers.

UNIT- V: Application Layer (18 Hours)

Application Layer: Client-Server Programming – Word Wide Web – Hyper Text Transfer Protocol(HTTP)– File Transfer Protocol(FTP)– electronic mail (email)–Domain Name System (DNS).

Total Lecture Hours- 90

COURSE OUTCOME

Students will be able to

1. Describe the basic concepts of Computer Network
2. Understand the Error Deduction and Wireless Networks
3. Explore the services of Network Layer
4. Describe Transport Layer Protocols
5. Learn the services of Application Layer

TEXT BOOK(S)

1. Behrouz A Forouzan. 2013. Data Communications and Networking.Fifth Edition, Tata McGraw Hill Education Pvt Ltd., New Delhi.

REFERENCE BOOK(S)

1. AchyutGodbole and AtulKahate.2011.Data Communications and Networks**.**Second Edition,TataMcGraw Hill Education Pvt Ltd.,New Delhi.
2. Gerry Howser.2020. Computer Networks and the Internet A Hands-On Approach. First Edition, Springer, Basingstoke, UK.
3. Andrew S Tanenbaum. 2003. Computer Networks. Fourth Edition, Prentice Hall PTR, New Jersey, USA.
4. Larry L Peterson, Bruce S Davie. 2012. Computer Networks: A Systems Approach. Elsevier Science, UK.
5. S A MRizvi, V K Sharma. 2011. An Introduction to Computer Networks.Alpha Science International, UK.

E-RESOURCES

1. https://www.geeksforgeeks.org/basics-computer-networking/
2. https://www.ibm.com/cloud/learn/networking-a-complete-guide
3. https://www.javatpoint.com/computer-network-transport-layer
4. https://nptel.ac.in/courses/106/105/106105183/
5. https://www.studytonight.com/computer-networks/

Semester: VI-CC-IX: Programming using Python

Ins. Hrs./Week: 6 **Course Credit:** 6 **Course Code: 20CA614**

OBJECTIVES

- To describe the core syntax and semantics of Python programming language
- To discover the need for working with the strings and functions
- To Illustrate the process of structuring the data using lists, dictionaries, tuples and sets; Indicate the use of regular expressions and built-in functions to navigate the file system, and Infer the Object-oriented Programming concepts in Python

UNIT- I: Basics of Python (18 Hours)

Introduction –parts of python programing language: identifiers, variables, various operators, expressions –data types– comments – read input and print output –control flow statements: if, while – Functions: Built-in functions, user-defined functions.

UNIT-II:Strings and Lists (18 Hours)

Creating and Storing Strings – Basic String Operations – Accessing Characters in String by Index Number – String Slicing and Joining –String Methods – Formatting Strings –Lists – Creating Lists –Basic List Operations –Indexing and Slicing in Lists –Built-in Functions Used on Lists – List Methods – The del Statement.

UNIT-III:Dictionaries, Tuples and Sets (18 Hours)

Creating Dictionary – Accessing and Modifying key:value Pairs in Dictionaries – Built-in Functions Used on Dictionaries – Dictionary Methods – The del Statement – Creating Tuples – Basic Tuple Operations – Indexing and Slicing in Tuples – Built-in Functions Used on Tuples – Relation between Tuples and Lists – Relation between Tuples and Dictionaries – Tuple Methods – Using zip() Function –Sets, Set Methods – Traversing of Sets – Frozenset.

UNIT- IV: Files and Regular Expressions (18 Hours)

Types of Files –Creating and Reading Text Data – File Methods to Read and Write Data – Reading and Writing Binary Files – The Pickle Module – Reading and Writing CSV Files – Python OS and OS– path Modules – Regular Expression Operations – Using Special Characters – Regular Expression Methods – Named Groups in Python Regular Expressions – Regular Expression with glob Module.

UNIT- V: Object-Oriented Programming in Python (18 Hours)

Classes and Objects – Creating Classes in Python – Creating Objects in Python – The Constructor Method –Classes with Multiple Objects –Class Attributes versus Data Attributes – Encapsulation – Inheritance – The Polymorphism.

Total Lecture Hours- 90

COURSE OUTCOME

Students will be able to

1. Interpret the fundamental Python syntax and semantics and be fluent in the use of Python control flow statements
2. Express proficiency in the handling of strings and functions
3. Determine the methods to create and manipulate Python programs by utilizing the data structures like lists, dictionaries, tuples and sets
4. Identify the commonly used operations involving file systems and regular expressions
5. Articulate the Object-Oriented Programming concepts such as encapsulation, inheritance and polymorphism as used in Python

TEXT BOOK(S)

1. Gowrishankar S, Veena A. 2018.Introduction to Python Programming. First Edition, CRC Press, Florida, USA.
2. Wesley JChun. 2001. Core Python Programming. First Indian Reprint,Addison Wesley Longman publishing Co., USA.

REFERENCE BOOK(S)

1. Allen B Downey.2012. Think Python: How to Think like a Computer Scientist. Second edition, O'Reilly Media, Newton, USA.
2. AurelienGeron. 2019. Hands-On Machine Learning with Scikit-Learn and TensorFlow. Second Edition, O'Reilly Media, Newton, USA.
3. Jake VanderPlas. 2016. Python Data Science Handbook: Essential Tools for Working with Data. First Edition, O'Reilly Media, Newton, USA.
4. Miguel Grinberg. 2018. Flask Web Development: Developing Web Applications with Python, Second Edition, O'Reilly Media, Newton, USA.
5. Wesley J Chun. 2015. Core Python Applications Programming. Third Edition, Pearson Education, USA.

E-RESOURCES

1. https://courses.minia.edu.eg/Attach/160011-%20Gowrishankar%20S.,%20Veena%20A.%20-%20Introduction%20to%20Python%20Programming%20(2019,%20CRC).pdf
2. https://greenteapress.com/thinkpython2/thinkpython2.pdf
3. http://index-of.es/Python/Core.Python.Applications.Programming.3rd.Edition.pdf
4. https://files.meetup.com/18552511/Learn%20Python%20The%20Hard%20Way%203rd%20Edition%20V413HAV.pdf
5. http://index-of.es/Varios-2/Fluent%20Python%20Clear%20Concise%20and%20Effective%20Programming.pdf

Semester: VI-CP-VI: Python Programming Lab

Ins. Hrs./Week: 5 **Course Credit:** 4 **Course Code: 20CA615P**

OBJECTIVES

- To write program using python.
- To understand the usage of string functions, class, method and object.
- To write program using exception handling, set and list.

LIST OF PROGRAMS

1. Write a Program to arithmetic calculation using input functions.
2. Write a Program to find prime number.
3. Write a Program to find biggest number among three numbers.
4. Write a program to demonstrate basic data type in python.
5. Write a Program to find leaf or non-leaf year using nested if functions
6. Write a Program to using switch statement to display Monday to Sunday.
7. Write a Program using string functions
8. Write a Program using class, method & object
9. Write a Program using Exception handling
10. Write a Program Using set
11. Write a Program Using List
12. Write a program to compute the number of characters, words and lines in a file.
13. Write a program to print each line of a file in reverse order. Write a program to compute the number of characters, words and lines in a file.
14. Write a program to use split and join methods in the string and trace a birthday of a person with a dictionary data structure
15. Write a Program for checking whether the given number is an even number or not. Using for loop.

Total Lab Hours- 75 Hours

COURSE OUTCOME

Students will be able to

1. Develop simple programs in python
2. Understand statements of python
3. Analyze data using python methods
4. Understand list, sets, etc.
5. Understand OOPs concepts in python programming

REFERENCE BOOK(S)

1. Eric Matthes. 2019.Python Crash Course: A Hands-On, Project-Based Introduction to Programming. Second Edition, No Starch Press, California, USA.
2. Mark Lutz. 2014.Python Pocket Reference,Python in Your Pocket.Fifth Edition O'Reilly media, Newton, USA.

3. Gowrishankar S, Veena A. 2018.Introduction to Python Programming. First Edition, CRC Press, Florida, USA.
4. Wesley JChun. 2001. Core Python Programming. First Indian Reprint, Addison Wesley Longman publishing Co., USA.
5. Miguel Grinberg. 2018. Flask Web Development: Developing Web Applications with Python, Second Edition, O'Reilly Media, Newton, USA.

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1. https://courses.minia.edu.eg/Attach/160011-%20Gowrishankar%20S.,%20Veena%20A.%20-%20Introduction%20to%20Python%20Programming%20(2019,%20CRC).pdf
2. https://greenteapress.com/thinkpython2/thinkpython2.pdf
3. http://index-of.es/Python/Core.Python.Applications.Programming.3rd.Edition.pdf
4. https://files.meetup.com/18552511/Learn%20Python%20The%20Hard%20Way%203rd%20Edition%20V413HAV.pdf
5. www.ideone.com

Semester: VI-MBE-II:1: Cloud Computing Technology

Ins. Hrs./Week: 5 **Course Credit:** 5 **Course Code: 20MBECA2:1**

OBJECTIVES

- TounderstandtheconceptsofCloud Computing
- Toknow CloudComputingArchitecture and Technology
- Tounderstandthecloud computing services

UNIT- I: Cloud Computing Foundation (15 Hours)

Introduction to Cloud Computing – Move toCloudComputing– Types of Cloud– Working of Cloud Computing.

UNIT-II: Cloud Computing Architecture (15 Hours)

CloudComputingTechnology–CloudArchitecture–CloudModelingandDesign– Virtualization:Foundation–Grid,CloudandVirtualization –VirtualizationandCloudComputing.

UNIT-III: Data Storage and Cloud Computing (15 Hours)

Data Storage – Cloud Storage – CloudStorage from LANs to WANs – Cloud Computing Services: Cloud Services –CloudComputing at Work.

UNIT-IV: Cloud Computing and Security (15 Hours)

Risks in Cloud Computing – Data Security inCloud–CloudSecurityServices– CloudComputingTools:ToolsandTechnologiesforCloud –CloudMashaps–ApacheHadoop–Cloud Tools.

UNIT- V: Cloud Application (15 Hours)

MovingApplicationstotheCloud–MicrosoftCloudServices–GoogleCloudApplications–A Amazon CloudServices–CloudApplications.

Total Lecture Hours: 75

COURSE OUTCOMES

Students will be able to

1. Understand theCloud Computing concepts
2. Learn CloudArchitecture and Virtualization
3. Know about and utilize Cloud Computing Services
4. Understand updates of CloudMashaps
5. Learnandimplementtheconceptof GoogleCloudApplications

TEXTBOOK(S)

1. Srinivasan A and Suresh J.2014. CloudComputing: APracticalApproachforLearningandImplementation.First Edition, PearsonEducation India, New Delhi.

REFERENCEBOOK(S)

1. Barrie Sosinsky. 2010. Cloud Computing Bible. Wiley Publications, New Jersey, USA.
2. James FRansome and John WRittinghouse. 2009. Cloud Computing: Implementation, Management, and Security. CRC Press,New York.
3. RajkumarBuyya, James Broberg, AndrzejGoscinski. 2014. Cloud Computing: Principles and Paradigms. Wiley Publications,India.
4. RajkumarBuyya,James Broberg, Andrej Goscinski. 2010. Cloud Computing Principles and Paradigm.Wiley Publications,India.
5. Thomas Erl, Ricardo Puttini, ZaighamMahmood. 2013. Cloud Computing Concepts, Technology & Architecture. Pearson Publications, India.

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4. https://www.google.co.in/books/edition/Cloud_Computing/YRIeASgVUJoC?hl=en&gbpv=1&pg=PR3&printsec=frontcover
5. https://www.google.co.in/books/edition/Cloud_Computing_A_Practical_Approach/mf0LMXve2gEC?hl=en&gbpv=1&printsec=frontcover.

Semester: VI-MBE-II:2: Mobile Applications Development

Ins. Hrs./Week: 5 **Course Credit:** 5 **Course Code: 20MBECA2:2**

OBJECTIVES

- To understand android SDK
- To know Android application development
- To explore working knowledge of Android Studio development tool

UNIT-I:Development Kit Walk-Through (15 Hours)

Getting to know android – Why Android?–The Open Handset Alliance–The Android Execution Environment–Components of an Android Application–Android Activity Lifecycle–Android Service Lifecycle–setting up your android development environment – Setting Up Your Development Environment–Creating an Android Development Environment–Using the android development environment for real applications.

UNIT- II: Under the Covers (15 Hours)

Startup Code and resources in the MJ Android Application –Initialization Parameters in AndroidManifest.xml–Initialization in MicroJobs.java– Debugging android applications– The Tools–Eclipse Java Editor–The API Demos Applications– Application Setup in the Manifest File–Finding the Source to an Interesting Example–Signing and publishing your Application.

UNIT- III: Programing Topics (15 Hours)

Persistent data storage: SQLite Databases and Content providers –Databases–Content Providers–location and Mapping –Location-Based Services–Mapping–The Google Maps Activity– The MapView and MapActivity–Working with MapViews–Building a view –Location Without Maps–Android GUI Architecture–Assembling a Graphical Interface–Wiring Up the Controller–The Menu.

UNIT- IV: Graphics (15 Hours)

A widget bestiary – Android Views–View Groups–LayoutsRolling Your Own Widgets–Layout–Drawing 2D and 3D graphics Canvas Drawing–Drawables–Bitmaps–Bling–Shadows –Radients and Filters–Animation–Transition animation–Background animation–Surface view animation–OpenGL Graphics.

UNIT- V: Communication (15 Hours)

Inter-process communication –Intents: Simple, Low-Overhead IPC–Remote Methods and AIDL–Android Interface Definition Language–Classes Underlying AIDL –Generated Interfaces–simple phone Calls – Quick and Easy Phone Calls–Exploring the Phone Code Through the Debugger–Exception Handling–Android Application –Level Modularity and Telephony–telephony state information and android telephony classes.

Total Lecture Hours: 75

COURSE OUTCOME

Students will be able to

1. Identify various concepts of mobile programming that make it unique from programming for other platforms
2. Critique mobile applications on their design pros and cons
3. Utilize rapid prototyping techniques to design and develop sophisticated mobile interfaces
4. Program mobile applications for the Android operating system that use basic and advanced phone features
5. Deploy applications to the Android marketplace for distribution

TEXT BOOK(S)

1. Rick Rogers, John Lombardo, ZigurdMednieks and Blake Meike.2013. Android Application Development.O'Reilly media,Newton, USA.
2. Lauren Darcey.2010. Sams Teach Yourself Android Application Development in 24 Hours.First edition, Sams publishers, Chennai.

REFERENCE BOOK(S)

1. Barry Burd. 2015. Android Application Development All-in-one for Dummies. Second Edition, Wiley publication, New Jersey, USA.
2. Lauren Darcey, ShaneConder. 2011. Android Wireless Application Development.Second Edition, Pearson Education, London, UK.
3. Mark L Murphy. 2009. Beginning Android. Wiley India Private Ltd., New Delhi.
4. Michael Burton. 2015. Android App Development for Dummies, Third edition, Wiley publication, Wiley publication, New Jersey, USA.
5. Reto Meier. 2010.Professional Android 2 Application Development. Wiley India Private Ltd., New Delhi.

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2. https://www.tutlane.com/tutorial/android/android-introduction
3. https://www.esys.ir/Files/Ref_Books/Android/esys.ir_Professional%20Android%202%20Application%20Development.pdf
4. http://ptgmedia.pearsoncmg.com/images/9780321813831/samplepages/0321813839.pdf
5. http://www.luciopanasci.it/Ebooks/Sams%20Teach%20Yourself%20Android%20Application%20Development%20in%2024%20Hours,%202nd%20Edition.pdf

Semester: VI-MBE-II:3: Data Science using R

Ins. Hrs./Week: 5 **Course Credit:** 5 **Course Code: 20MBECA2:3**

OBJECTIVES

- To understand the data science and the data science process
- To understand beginning process of R and to describe basic graphics and statistics methods of R
- To provide knowledge about analysis of variance and to understand about some advanced methods and models to improve analysis and data presentation

UNIT-I:Introduction to Data Science **(15 Hours)**

Data Science in a big data world – Benefits and uses of data science and big data – Facets of data – the data science process – the big data ecosystem and data science – An Introductory Working Example of Hadoop– The Data Science Process – Machine learning – Handling Large Data on a Single Computer.

UNIT- II: Introduction to R **(15 Hours)**

Working with R – packages –Creating a data set – understanding datasets – data structures – data input – annotating datasets –Useful functions for working with data objects –Working with graphs – A simple example – graphical parameters – Adding text, customized axes, and legends – Combining graphs – Getting started with graphs –basic data management –advanced data management.

UNIT- III: Basic Methods of R **(15 Hours)**

Basic Graphs – Bar Plots – pie Charts – Histograms – Kernel Density Plots – Box Plots – Dot Plots –Basic Statistics– Descriptive Statistics – Frequency And Contingency Tables– Correlation – t-tests – Non Parametric tests of Group Differences – Visualizing Group Difference.

UNIT- IV: Intermediate Methods **(15 Hours)**

Regression –The many faces of regression – OLS regression –Regression diagnostics – Unusual observations – Corrective measures – Selecting the "best" regression model – Taking the analysis further–Analysis of variance –power analysis –intermediate graphs –resembling statistics and bootstrapping.

UNIT-V:Advanced Methods **(15 Hours)**

Generalized linear models –Generalized linear models and the glm() function – Logistic regression– Poisson regression –Principal components and factor analysis:Principal components and factor analysis in R – Principal components –Exploratory factor analysis –Advanced methods for missing data –advanced graphics.

Total Lecture Hours: 75

COURSE OUTCOME

The students will be able to

1. Understand the data science and the data science process
2. Understand beginning process of R
3. Describe basic graphics and statistics methods of R
4. Provide knowledge about analysis of variance
5. Understand about some advanced methods and models to improve analysis and data presentation

TEXT BOOK(S)

1. Rachel Schutt, Cathy O'Neil. 2013. Doing Data Science. First Edition, O'Reily Media, Newton, USA.
2. Robert IKabacoff.2011. R in Action: Data Analysis and Graphics with R.Second Edition, Manning Publications, New York, USA.

REFERENCE BOOK(S)

1. Jay Liebowitz.2013. Big Data and Business Analytics.First Edition, Auerbach Publications, Boca Raton, USA.
2. Joel Grus. 2015. Data Science from Scratch. First Edition, O'Reilly Media, Newton, USA.
3. Michael R Berthold, David J Hand. 2007. Intelligent Data Analysis: An Introduction, Springer, Germany.
4. Roger D Peng.2012. R programming for Data Science. New Edition, Lulu publishers (www.lulu.com)
5. Tom Plunkett, Mark Hornick. 2013. Using R to Unlock the Value of Big Data: Big Data Analytics with Oracle R Enterprise and Oracle R Connector for Hadoop.McGraw-Hill Osborne Media, New York, USA.

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3. http://math.ecnu.edu.cn/~lfzhou/seminar/[Joel_Grus]_Data_Science_from_Scratch_First_Princ.pdf
4. http://www.bubhopal.ac.in/Site/Upload//c3a16bc3-3610-4a34-af5e-f12794b1455e.pdf
5. http://www.cs.uni.edu/~jacobson/4772/week11/R_in_Action.pdf

Semester: VI-GS- Gender Studies

Ins. Hrs./Week: 1 **Course Credit:** 1 **Course Code: UGGS**

OBJECTIVES

- To make boys and girls aware of each other's strengths and Weakness
- To develop sensitivity towards both genders in order to lead an ethically enriched life. To promote attitudinal change towards a gender balanced ambience and women empowerment

UNIT- I: Concepts of Gender (3 Hours)

Sex – Gender – Biological Determinism – Patriarchy – Feminism – Gender Discrimination – Gender Division of labour – Gender Stereotyping – Gender Sensitivity – Gender Equity – Equality – Gender Mainstreaming – Empowerment.

UNIT- II: Women's Studies Vs Gender Studies (3 Hours)

UGC's Guidelines – VII to XI Plans – Gender Studies: Beijing Conference and CEDAW – Exclusiveness and Inclusiveness.

UNIT- III: Areas of Gender Discrimination (3 Hours)

Family – Sex Ratio – Literacy – Health – Governance – Religion Work Versus Employment – Market – Media – Politics – Law – Domestic Violence – Sexual Harassment – State Policies and Planning.

UNIT-IV: Women Development and Gender Empowerment (3 Hours)

Initiatives – International Women's Decade – International Women's Year – National Policy for Empowerment of Women – Women Empowerment Year 2001 – Mainstreaming Global Policies.

UNIT- V: Women's Movements and Safeguarding Mechanism (3 Hours)

In India National /State Commission for Women(NCW) – All Women Police Station – Family Court – Domestic Violence Act – Prevention of Sexual Harassment at Work Place Supreme Court Guidelines – Maternity Benefit Act – PNDT Act – Hindu Succession Act 2005 – Eve Teasing Prevention Act – Self Help Groups – 73rd and 74th Amendment for PRIS

Total Lecture Hours- 15

REFERENCE BOOK(S)

1. Bhasin Kamala, Understanding Gender : Gender Basics , New Delhi : Women Unlimited, 2004
2. Bhasin Kamala, Exploring Masculinity: Gender Basics , New Delhi: Women Unlimited, 2004
3. BhasinKamala , What is Patriarchy? : Gender Basics, New Delhi :Women Unlimited,1993

4. PernauMargrit, Ahmad Imtiaz, ReifeldHermut (ed.,)Family and Gender : Changing Values in Germany and India ,New Delhi :Sage Publications,2003
5. AgarwalBina, Humphries Jane and Robeyns Ingrid(ed.,) Capabilities , Freedom , and Equality: AmartyaSen's Work from a Gender Perspective,NewDelhi : Oxford University Press,2006
6. Rajadurai. S.V,Geetha.V,Themes in Caste Gender and Religion, Tiruchirappalli :Bharathidasan University,2007
7. MisraGeetanjali, ChandiramaniRadhika (ed.,) Sexuality , Gender and Rights: Exploring Theory and Practice in South and Southeast Asia, New Delhi : Sage Publication,2005
8. RaoAnupama (ed.,) Gender &Caste : Issues in Contemporary Indian Feminism, New Delhi : Kali for Women, 2003
9. SahaChandana , Gender Equity and Gender Equality : Study of Girl Child in Rajasthan , Jaipur: Rawat Publication,2003.
10. Krishna Sumi, (ed.,),Livelihood and Gender : Equity in Community Resource Management, New Delhi : Sage Publication,2004
11. Pludi.A Michele(ed.,) praeger Guide to the Psychology of Gender ,London : Praeger Publisher,2004
12. Wharton .S Amy , The Sociology of Gender : An Introduction to Theory and Research , USA : Blackwell Publishing,2005
13. MohantyManoranjan(ed.,) Class ,Caste,Gender : Readings in Indian Government and Politics – 5,New Delhi : Sage Publications,2004.
14. AryaSadhna, Women Gender Equality and the State ,New Delhi :Deep &Deep Publication, 2000

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SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE

(AUTONOMOUS)

SUNDARAKKOTTAI, MANNARGUDI- 614016.

(For the Candidates admitted in the academic year 2020 – 2021)

DEPARTMENT OF COMPUTER APPLICATIONS

BACHELOR OF COMPUTER APPLICATIONS (BCA)

Semester: III-NME-I: Fundamentals of Information Technology

Ins. Hrs./Week: 2 **Course Credit:** 2 **Course Code: 20NMECA31**

OBJECTIVES

- ToProvidetheBasicConceptsinComputers
- To Provide the memory devices concepts
- To provide basic concepts of the software, programming,databases,operating system

UNIT- I: Introduction to Computers (6 Hours)

Introduction to Computers – Generation of Computers – Classification of DigitalComputer – Anatomyof DigitalComputer.

UNIT- II: Input and Output Devices (6 Hours)

Central Processing Unit (CPU)andMain Memory – Secondary Storage Devices – InputDevices – OutputDevices.

UNIT- III: Introduction toComputerSoftware& DBMS (6 Hours)

IntroductiontoComputerSoftware – ProgrammingLanguage – OperatingSystems–Introduction toDatabase ManagementSystem.

UNIT- IV: Networks and World Wide Web (6 Hours)

ComputerNetworks –World Wide Web (WWW)andInternet – Electronic main (Email) – Webpage Design.

UNIT- V: Applications of Computers (6 Hours)

ComputersatHome,Education,Entertainment,Science,MedicineandEngineering– Introduction to Computer Security– Computer Viruses – Bombs –Worms.

Total Lecture Hours- 30

COURSE OUTCOMES

Students will be able to understand

1. Generation of computers
2. Memory devices
3. Software, programming, and operating concepts
4. Networks in computer
5. Applications of computers

TEXTBOOK(S)

1. AlexisLeonandMathewsLeon.2009.FundamentalsofInformationTechnology. VikasPublishing House Pvt. Ltd., India.

REFERENCEBOOK(S)

1. Alexis Leon and Mathews Leon. 2000.Fundamentals of Information Technology,Pearson Education, London, UK.

2. Anushuman Sharma. 2016. Fundamentals of Computers and Information Technology. Fifth Edition, Lakhanpal Publications, Punjab.
3. Doja M.N. 2005.FundamentalsofComputersandInformationTechnology. Deep and Deep publications, New Delhi.
4. James Bernstein. 2018. Computers Made Easy.Second Edition,Self-publications.
5. Rajaraman. 2000. Introduction to Information Technology. Third Edition, PHI Learning Private Limited, New Delhi.

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2. https://www.schandpublishing.com/books/tech-professional/computer-science/fundamentals-information-technology/9788182092457
3. https://www.w3spoint.com/computer-fundamentals-tutorial
4. https://www.researchgate.net/publication/318491162_Fundamentals_of_Information_Technology
5. https://www.networkdepot.com/information-technology-concepts

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DEPARTMENT OF COMPUTER APPLICATIONS

BACHELOR OF COMPUTER APPLICATIONS (BCA)

Semester: IV-NME-II: World Wide Web using HTML

Ins. Hrs./Week: 2 **Course Credit:** 2 **Course Code: 20NMECA42**

OBJECTIVES

- ToProvidetheBasicConceptsinNetworking
- To know the Internet Addressing
- To Facilitate the Concept Internet Browsers

UNIT-I: Introduction to the Internet (6 Hours)

Computer Networking–Internet–Electronic Mail– World Wide Web – Usenet –Telnet.

UNIT-II: Internet Technologies (6 Hours)

Modem – Internet Addressing (Domain Name System)– Physical Connection – Telephone Lines.

UNIT-III: Web Browsers (6 Hours)

What is web browser? –Internet Explorer– Netscape Navigator– Google Chrome – Search Engine- Google.

UNIT-IV: Introduction to HTML (6 Hours)

History of HyperTextMarkup Language (HTML)– HTML generations–HTML Documents – HTML Tags – Anchor Tag – Hyper Links.

UNIT-V: Designing a Web Page (6 Hours)

Designing the Body Section –Ordered and Unordered Lists – Table Handling – Frames – Forms – A simple Web Page Design.

Total Lecture Hours- 30

COURSE OUTCOME

Students will be able to

1. Understand basic concept of networking
2. Know the internet technologies
3. Familiar with internet explorer
4. Learn HTML
5. Design a simple web page

TEXTBOOK(S)

1. Xavier C. 2008. World Wide Web Design with HTML.Nineteenth Reprint, Tata McGraw Hill Publishing Company Ltd.,New Delhi.

REFERENCEBOOK(S)

1. HirdeshBhardwaj.2016. Web Designing. First Edition,BPB Publications, New Delhi.
2. Laura Lemey,Rafe Colburn,Jennifer Kyrnin.2016. Mastering HTML, CSS

&Javascript Web Publishing. First Edition, BPB Publications, New Delhi.
3. Julie C Meloni.2012. Sams Teach Yourself HTML, CSS And JavaScript.Pearson Publications, London, UK.
4. NavneetMehra, Bunny Mehra. 2012. Website Development Using HTML and CSS. Unicorn books, New Delhi.
5. Satish Jain. 2015. Web Designing and Development: Training Guide. First Edition, BPB Publications, New Delhi.

E-RESOURCES

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2. https://courses.lumenlearning.com/computerapps/chapter/reading-the-world-wide-web
3. https://www.javatpoint.com/what-is-world-wide-web
4. https://www.w3.org/People/Frystyk/thesis/WWW.html
5. https://worldwideweb.cern.ch/worldwideweb

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DEPARTMENT OF COMPUTER APPLICATIONS

BACHELOR OF COMPUTER APPLICATIONS (BCA)

Semester: IV-SBE-I: Computer System Assembly and Troubleshooting

Ins. Hrs./Week: 2 **Course Credit:** 2 **Course Code: 20SBECA1**

OBJECTIVES

- ToProvidethePersonal Computer Fundamentals
- To Provide the information of MotherboardControllersandSystemResources
- To provide basic concepts of Hardware Devices

UNIT-I: Fundamentals of PC Technology (6 Hours)

FundamentalsofPCtechnology:FundamentalBuildingBlocksofthePC– PrinciplesofCPUOperations –CPUfamily& Operation.

UNIT-II: Motherboard Controllers and System Resources (6 Hours)

Motherboards: Motherboard Controllers and System Resources–The I/O System Bus – Onboard I/O Devices Power Supply, Cooling and Protection : The Power Supply – Ventilation and Cooling Protection – Power Production andBackup.

UNIT-III: Magnetic Storage andI/O Devices (6 Hours)

Magnetic Storage –Hard Disk Drives – Optical Storage Devices:Optical StorageMedia – CD-ROM Drives – DVD-ROM Drives - I/O Ports and Devices: SerialPorts–ParallelPorts–UniversalSerialBus.

UNIT-IV: Keyboards and Pointing Devices (6 Hours)

Keyboards and Pointing Devices: Keyboards – Pointing Devices Modems and Communications: Modems– ISDN– CATV Network Modems– DSL. Networking: Networking Fundamentals–Network Hardware–Network Protocols.

UNIT-V: Printers and Troubleshooting Tools (6 Hours)

Printers:Types–PrinterAttributes–PrinterMaintenance– TroubleshootingToolsandTechniques:ToolsoftheTrade–BasicPCHandlingTechniques

Total Lecture Hours- 30

COURSE OUTCOME

Students will be able to

1. Understand personal computer fundamentals
2. Know Information of motherboardcontrollers
3. Explore basic concepts of hardware devices
4. Know networking fundamentals
5. Understand basicPChandlingtechniques

TEXTBOOK(S)

1. CraigZacker,JohnRourke. 2001. TheCompleteReference:PCHardware.First Edition,TataMcGrawHill Education Private Limited, New Delhi.

REFERENCEBOOK(S)

1. Arnold S Berger. 2005. Hardware and Computer Organization. First Edition, Newnes, London, UK.
2. Edward K.Blum, Alfred V.Aho. 2011. Computer Science: The Hardware,Software and Heart of it.Springer Publication, New York, USA.
3. Govindarajulu.B. 2002. IBM PCandclones:Hardware,Troubleshooting and Maintenance",Secondedition,Tata-McGrawHill, New Delhi.
4. MirceaVladutiu. 2012. Computer Arithmetic: Algorithms and Hardware Implementations. Springer Publication, New York.
5. WinnLRosch, 2001. HardwareBible. Sixth Edition, Que publishers, Indiana, UK.

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4. https://www.unf.edu/public/cop4610/ree/Notes/PPT/PPT8E/CH%2001%20-OS8e.pdf
5. https://freecomputerbooks.com/compscArchitectureBooks.html

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DEPARTMENT OF COMPUTER APPLICATIONS

BACHELOR OF COMPUTER APPLICATIONS (BCA)

Semester: V-SBE-II: Microsoft Office Tools

Ins. Hrs./Week: 2 **Course Credit:** 2 **Course Code: 20SBECA2**

OBJECTIVES:

- To providethe Computers Fundamental
- To be familiar with MS word
- To understand MS Excel properties

UNIT-I: Computer Fundamentals **(6 Hours)**

ComputerandOperatingsystemFundamentals–Componentsofa Computer System–InputandOutputdevices–MemoryHandling–StorageDevices.

UNIT-II : MS Word **(6 Hours)**

IntroductiontoMSWordand Users Utilities – ExploringTemplates&Formation ofdocuments–Table Handling –Mail Mergeand Print Process

UNIT-III : MS Excel **(6 Hours)**

Spreadsheet – WorkbookWindow – Formatting Cells, Worksheet – WorkingwithFormula,Functionand Charts – Filtering Dataand PrintingaPresentation.

UNIT-IV: MS PowerPoint **(6 Hours)**

Introduction toMS PowerPoint –CreatingTemplates–Font and Colorediting–Adding–Multimedia Effects –Consolidating usingMS Power Point.

UNIT V: Office Appliances **(6 Hours)**

Accounting Machine–Addressing Machine–EnvelopeSealing Machine–Franking Machine & other Modern Office Gadgets.

COURSE OUTCOME

Students will be able to

1. Know basic conceptsin computers
2. Create MS Word documents
3. Use MS Excel spreadsheets
4. Create MS Powerpoint slides
5. Know office appliances

TEXTBOOK(S)

1. Alexis Leon. 2000. Internet and MS-Office. Pearson Publications, London, UK
2. Mohan Kumar K,Rajkumar S.Computer Application in Business. Second Edition, Vijay NicoleImprints Private Limited, Chennai.
3. Pillai R S N, Bagavathi V. 2000. Office Management. S.Chand Publications, New Delhi.
4. Rajaraman. 2018. Computer Basics and C programming. PHI Learning,New Delhi.

5. SrinivasaVallabhan S V. 2014. Computer Application in Business, Fifth Edition, Sultan Chand and Sons, New Delhi.

REFERENCEBOOK(S)

1. Gray B Shelly, Misty E Vermaat. 2010. Microsoft Office 2010: Introductory. Cengage Learning, Boston, USA.
2. Lisa Friedrichen. 2013. Enhanced Microsoft Access 2013. PHP publications, New Delhi.
3. Margo Chaney Adkins, Stephanie Murre. 2019. Skills for Success with Microsoft Office 2019 Introductory. First Edition, Pearson publishers, London, UK.
4. Mohan Kumar K ,RajkumarS. 2009. Computer Application in Business. Second Edition, Tata McGraw-Hill Publishing Company Limited, NewDelhi.
5. SanfaySaxena. 2000. MS Office 2000 for Everyone. First Edition, VikasPublishing House Pvt. Ltd., Chennai.

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4. https://download.microsoft.com/download/1/2/F/12F1FF78-73E1-4714-9A08-6A76FA3DA769/656949ebook.pdf
5. https://freecomputerbooks.com/microsoftOfficeBooks.html

Semester: V-SBE-III: Desktop Publishing Tool

Ins. Hrs./Week: 2 **Course Credit:** 2 **Course Code: 20SBECA3**

OBJECTIVES

- GettingStartedwithAdobePageMaker7.0
- Familiar in WorkingwithMultiplePages
- To Understand WorkingwithGraphics

UNIT- I: Introduction to Adobe PageMaker7.0 (6 Hours)

Getting Started with AdobePageMaker7.0 – Menu Bar – Toolbox and Palettes –Create and Save File –Creating a Simple Brochure– Importing Text and File– Manipulating Text Blocks – Page setup.

UNIT- II: Working with Text (6 Hours)

Formatting Text –Modifying Text – Creating New Text –WorkingwithMultiplePages– Paragraphs – Defining a Paragraph – Paragraph Style – Creating a New Style –Bullet and Numbering.

UNIT- III: Graphics and Text (6 Hours)

Workingwith Graphics – Drawing Tools – Frames – Stacked Objects – Selecting Multiple Objects – Importing Graphics – Cropping an Image – Control Palette – Graphics Inside Frames – Combining Graphics with Text – Textwrap – Captions.

UNIT- IV: Advanced Graphics options and Mailmerge (6 Hours)

UsingAdvanced Graphics – Elements – Stoke and Fill –Outlines –AddingColor– UsingMailMerge– Frames – Creating a Frame – Change to Frame– Header and Footer – Multiple columns.

UNIT- V: Publications (6 Hours)

Importing and Exporting –Master Pages – Multiple Master Pages – The Publication Window – Making a BookList – Creating a Story –Story Editor –Spell Checking –WorkingwithLong Publications – Links – Printing –PublishingElectronically.

Total Lecture Hours- 30

COURSE OUTCOME

Students will be able to

1. Use AdobePageMaker7.0
2. Know the ModifyingText
3. Apply Formatting options in Text
4. Use AdvancedGraphics
5. Publish documentsElectronically

TEXTBOOK(S)

1. Kevin Proot.2002. Adobe PageMaker 7.0.Cengage Learning, Boston, USA.

2. Joy L Starks, Misty E. Vermatt. 2016. Microsoft Publisher 2016 Introductory.First Edition,Cengage Learning, Boston, USA.

REFERENCEBOOK(S)

1. B Chagnon. 2002. The Publishing Business: Desktop Publishing Software. Michigan Publishing, Ann Arbor, Michigan, USA.
2. Bill Parsons. 2012. Graphics Design with Pagemaker. Cengage Learning, Boston, USA.
3. EllennBehovian, Erika Kendra. 2007. Adobe PageMaker 7. Pearson Publications, London, UK.
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5. Linda Tapscott, Kate O'Day. 1999. Adode Page Maker 6.5 PlusProductivity Kit. Adobe Publication, California, USA.

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