

**SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE
(AUTONOMOUS)**



(Affiliated to Bharathidasan University)
(Accredited by NAAC; An ISO 9001:2015 Certified Institution)
SUNDARAKKOTTAI, MANNARGUDI – 614016.
TAMILNADU, INDIA.

B.Sc., COMPUTER SCIENCE
LEARNING OUTCOMES BASED CURRICULUM FRAMEWORK(CBCS-LOCF)
(For the candidates admitted in the academic year 2022–2023)

PROGRAMME OUTCOMES FOR B.Sc., DEGREE

PO No.	Program Outcomes (Upon completion of the B.Sc. Degree Programme, the Undergraduate will be able to)
PO-1	Disciplinary knowledge: demonstrate comprehensive knowledge and understanding of one or more disciplines that form a part of an undergraduate programme of study in Bachelor of Science.
PO-2	Critical thinking and Problem Solving: think critically about the issues and identify, critically analyze and solve problems from the disciplines of concern using appropriate tools and techniques and the knowledge, skills and attitudes acquired and extrapolate the same to real life situations.
PO-3	Scientific reasoning: analyse, interpret and draw conclusions from quantitative/qualitative data; and critically evaluate ideas, evidence and experiences from an open-minded and reasoned perspective.
PO-4	Digital literacy and Effective Communication: use ICT in a variety of learning situations and speak, read, write and listen clearly in person and through electronic media in English and in one or more Indian languages, and make meaning of the world by connecting people, ideas, books, media and technology.
PO-5	Individual and Team Work: effectively accomplish tasks individually as well as work effectively and respectfully as member or leader with diverse teams, facilitate cooperative or coordinated effort on the part of a group, and act together as a group or a team in the interests of a common cause and work efficiently as a member of a team.
PO-6	Environment and Sustainability: understand the impacts of technology and business practices in societal and environmental contexts, and sustainable development.
PO-7	Human values and Gender Issues: understand major ideas, values, beliefs, the nature of the individual and the relationship between self and the community and aware of the various issues concerning women and society
PO-8	Self directed and Lifelong learning: acquire knowledge and skills, including learning “how to learn”, that are necessary for participating in learning activities throughout life and to engage in independent and life-long learning in the broadest context of socio-technological changes.

PROGRAMME SPECIFIC OUTCOMES FOR B.Sc., COMPUTER SCIENCE

PSO No.	Program Specific Outcomes <i>(Upon completion of the B.Sc., COMPUTER SCIENCE Degree Programme, the Undergraduate will be able to)</i>
PSO-1	Understand of the basics of Computer Science discipline.
PSO-2	Apply fundamental principles and methods of Computer Science to a wide range of applications.
PSO-3	Critically Analyze a problem, Identify, Formulate and Solve problems in the field of computer science considering current and future trends.
PSO-4	Design, Analysis and Implement solutions to significant computational problems and to meet desired needs within realistic constraints.
PSO-5	Build and manage the execution of an effective project plan in computer science.

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TAMILNADU, INDIA.

B.Sc., COMPUTER SCIENCE

CHOICE BASED CREDIT SYSTEM – LEARNING OUTCOMES BASED CURRICULUM FRAMEWORK (CBCS – LOCF)

(For the candidates admitted in the academic year 2022 – 2023)

ELIGIBILITY: Those who have completed in 10th ,+2 examinations with Mathematics as one the core subject

Sem	Part	Nature of the Course	Course Code	Title of the Course	Inst. Hours/ Week	Credit	Exam Hours	Marks			
								CIA	ESE	Total	
I	I	Language Course – I (LC) – Tamil*/Other Languages **	22LC101	Ikkala Ilakkiyam	6	3	3	25	75	100	
	II	English Language Course -I(ELC)	21ELC101	Prose and Communication Skills	6	3	3	25	75	100	
	III		Core Course – I (CC)	22CS101	C Programming	5	4	3	25	75	100
			Core Practical - I (CP)	22CS102P	C Programming Lab	3	2	3	40	60	100
			First Allied Course –I (AC)	22AMA101	Algebra and calculus	4	3	3	25	75	100
		First Allied Course – II (AC)	22AMA102	Numerical analysis	4	3	3	25	75	100	
	IV	Value Education	22UGVED	Value Education	2	2	3	25	75	100	
TOTAL					30	20				700	
II	I	Language Course – II (LC) - Tamil*/Other Languages **	22LC201	Idaikala Illakkiyamum puthinamum	6	3	3	25	75	100	
	II	English Language Course – II (ELC)	21ELC201	Poetry and Communication Skills	6	3	3	25	75	100	
	III		Core Course – II (CC)	22CS203	Programming in C++	6	6	3	25	75	100
			Core Practical - II (CP)	22CS204P	Programming in C++ Lab	3	2	3	40	60	100
			First Allied Course – III(AC)	22AMA203	Statistics	4	2	3	25	75	100
		First Allied Course – IV(AC)	22AMA204	Operations research	3	2	3	25	75	100	
	IV	Environmental Studies	22UGCES	Environmental Studies	2	2	3	25	75	100	
TOTAL					30	20				700	
	I	Language Course – III(LC)– Tamil*/Other Languages **	22LC301	Kappiyamum Nadagamum	6	3	3	25	75	100	

III	II	English Language Course - III (ELC)	22ELC301	Language through Literature III(Drama and Communication Skills)	6	3	3	25	75	100
	III	Core Course – III (CC)	23CS305	Programming in Java	6	6	3	25	75	100
		Core Practical - III (CP)	23CS306P	Programming in Java Lab	3	2	3	40	60	100
		Second Allied Course – I (AC)	23APH301	Applied Physics–I	4	3	3	25	75	100
		Second Allied Practical-I (AP)	23APH302P	Applied Physics Practical-I	3	2	3	40	60	100
		Non Major Elective - I -for those who studied Tamil under Part -I a) Basic Tamil for other language students b) Special Tamil for those who studied Tamil upto +2 but opt for other languages in degree programme			2	2	3	25	75	100
TOTAL					30	21				700
IV	I	Language Course –IV (LC) - Tamil*/Other Languages **	22LC401	Pandaiya Illakkiyam	6	3	3	25	75	100
	II	English Language Course– IV (ELC)	22ELC401	Language through Literature- IV (ShortStories and Communication Skills)	6	3	3	25	75	100
	III	Core Course – IV (CC)	23CS407	Database Management System	5	5	3	25	75	100
		Core Practical - IV (CP)	23CS408P	Database Management System Lab	3	2	3	40	60	100
	III	Second Allied Course –II(AC)	23APH403	Applied Physics–II	4	3	3	25	75	100
		Second Allied Practical – II(AP)	23APH404P	Applied Physics Practical –II	3	2	3	40	60	100
	IV	Non Major Elective – II for those who studied Tamil under Part I a) Basic Tamil for other language students b) Special Tamil for those who studied Tamil upto +2 but opt for other languages in degree programme			2	2	3	25	75	100
		Skill Based Elective – I	23SB ECS1	Page maker	2	2	3	25	75	100
	TOTAL					31	22			

		Core Course V [CC]	R23CS509	Fundamentals of Data Structures and Algorithms	6	6	3	25	75	100
V	III	Core Course VI [CC]	R23CS510	Computer System and Networks	6	6	3	25	75	100
		Core Course VII [CC]	R23CS511	Python Programming	5	5	3	25	75	100
		Core Practical V [CP]	R23CS512P	Python Lab	3	3	3	40	60	100
		Major Based Elective - I	R23MBECS1:1/ R23MBECS1:2	Software Engineering /Digital Electronics and Microprocessor	4	4	3	25	75	100
	IV	Skill Based Elective – II	R23SBECS2	Corel Draw	2	2	3	25	75	100
		Skill Based Elective – III	R23SBECS3	Dream Weaver	2	2	3	25	75	100
		Soft Skills Development	23UGSDC	Soft Skills Development	2	2	3	25	75	100
TOTAL				30	30				800	
VI	III	Core Course VIII [CC]	R23CS613	Operating Systems	6	6	3	25	75	100
		Core Course IX [CC]	R23CS614	Programming in PHP	6	6	3	25	75	100
		Core Practical VI [CP]	R23CS615P	Programming in PHP Lab	5	4	3	40	60	100
		Major Based Elective - II	R23MBECS2:1/ R23MBECS2:2	Cloud Computing/ Mobile Computing	5	4	3	25	75	100
		Core Project	R23CSPW	Group Project	6	5	3	25	75	100
	V	Extension Activities		Extension Activities	-	1	-	-	-	-
		Gender Studies	23UGGS	Gender Studies	1	1	3	25	75	100
TOTAL				29	27				600	
Grand Total				180	140	-	-	-	4300	

**CURRICULUM DESIGN
LIST OF ALLIED
COURSES**

ALLIED COURSE I – MATHEMATICS

ALLIED COURSE II-PHYSICS

Subject	No. of Courses	Total Credits
Language Part – I	4	12
English Part –II	4	12
Core Course	9	50
Core Practical	6	15
Allied Course	6	16
Allied Practical	2	4
Non-Major Elective	2	4
Skill Based Elective	3	6
Major Based Elective	2	8
Project	1	5
Environmental Studies	1	2
Value Education	1	2
Soft Skills Development	1	2
Gender Studies	1	1
Extension Activities	-	01 (Credit only)
Total	43	140

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

+ Syllabus for other Languages should be on par with Tamil at degree level

#those who studied Tamil upto 10th +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

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 University Examinations 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 University Examinations shall be 40% out of 60 marks [i.e. 24 marks]

NON MAJOR ELECTIVE (NME) OFFERED BY THE DEPARTMENT

Semester	Part	Course	Course Code	Title of the Paper
III	IV	NME -I	23NMECS31	Working Principles of Internet
IV		NME -II	23NMECS42	Fundamentals of Information Technology

SKILL BASED ELECTIVE (SBE) OFFERED BY THE DEPARTMENT

Semester	Part	Course	Course Code	Title of the Paper
IV	IV	SBE-I	23SBECS1	Page Maker
V		SBE-II	R23SBECS2	Corel Draw
V		SBE-III	R23SBECS3	Dream Weaver

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**PG AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE
B.Sc., COMPUTER SCIENCE**

(For the Candidates admitted in the academic year 2022 – 2023)

Question Paper Pattern – (Theory)

Max time:3 Hours

Max Marks:75

Section – A (10 x 2 = 20)

Answer all the questions

Answer in One or Two sentences each

- 1.
2. Unit I }
3.
4. Unit II }
5.
6. Unit III }
7.
8. Unit IV }
9.
10. Unit V }

Section – B (5 x 5 = 25)

Answer all the questions

Each answer should not exceed 500 words

11. a (or)
b Unit I
12. a (or)
b Unit II
13. a (or)
b Unit III
14. a (or)
b Unit IV
15. a (or)
b Unit V

Section – C (3 x 10 = 30)

Answer any THREE questions in 1200 words

- 16 Unit I
- 17 Unit II
- 18 Unit III
- 19 Unit IV
- 20 Unit V

SEMESTER I

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DEPARTMENT OF COMPUTER SCIENCE

B.Sc., COMPUTER SCIENCE

Semester: I- CC-I: C Programming

Ins. Hrs. /Week: 5

Course Credit: 4

Course Code:22CS101

OBJECTIVES

- To acquire the basic knowledge of Programming Skills in C language
- To understand strengths of C, which provide the means of writing efficient, maintainable, and portable code
- To obtain the knowledge in C language with the wide variety of examples and applications

UNIT- I : Introduction to Computer

(13 Hours)

Importance of Computers- History and development –Classification of Computers-Generation of Computers- Benefits and limitations of Computers-Hardware-Software- **Computer Architecture:** Input/ Output Unit-CPU-ALU-Memory Systems-RAM-ROM- Comparison between low level and high level language.

UNIT- II: Introduction to C

(15 Hours)

C fundamentals - Character set - Identifier and keywords - Data types -Constants - Data input and output functions- Variables Declarations - Library functions- Declaration of Storage classes - Expressions - Statements - Arithmetic, Unary, Relational and logical, Assignment and Conditional Operators.

UNIT -III: Flow control and Decision Making

(17 Hours)

If, if-else, ladder if. **Looping:** while, do-while, for loop, Nested control structures - Switch, break and continue, go to statements - Comma operator- **Functions:** Definition– User defined function - Definition of functions - Category of functions-Nesting of functions – Passing arguments – Recursions – Scope visibility and lifetime of variables.

UNIT -IV: Arrays

(17 Hours)

Defining and Processing -Types of arrays-One dimensional arrays-Two dimensional arrays- Passing arrays to functions – Multidimensional arrays - Arrays and String- **Structures:** Introduction-Defining a Structure- Size of structures - Passing structures to functions – Unions- Difference between array, structure and union- Bit field.

UNIT –V: Pointers

(13 Hours)

Introduction –Declaring pointer variables - Pointers to Functions - Pointer and Arrays - Arrays of Pointers-Structures and Pointers-**Files:** Creating Processing, Opening and Closing a data file - Applications of C Programming-**Dynamic memory allocation and Linked Lists:** Introduction dynamic memory allocation-Allocating a Block of memory: malloc-Allocating a multiple Blocks of memory: calloc-Altering the size of a Block: Realloc- concepts of Linked Lists-Advantages of Linked Lists- Types of Linked List-pointers revisited-creating a Linked List.

Total Lecture Hours-75

COURSE OUTCOME

The students are able to

1. Understand the basic terminology used in computer programming.
2. Develop programming skill in C Language.
3. Design programs involving decision structures, loops and functions
4. Design and develop alternate methods of solving variety of problems.
5. Understand the use of Arrays and Structures.
6. Examine and explore the use of memory allocation for application programs.
7. Apply and implement programs for solving real world problems.

TEXT BOOK(S)

1. Alexis Leon, Mathews Leon 2009, Fundamentals of Information Technology, Leon Press Vikas Publishing Pvt.Ltd, New Delhi.
2. Balagurusamy E 2018, Programming in ANSI C, Eighth Edition, McGraw-Hill Publication, USA.

REFERENCE BOOK(S)

1. Bichkar R.S. 2012, Programming with C, University Press, Oxford.
2. Herbert Schildt 2017, C -The Complete Reference, Fourth Edition McGraw Hill Education, USA.
3. Mike Mcgrath,C 2018, Programming in Easy Steps, Fifth Edition , In Easy Steps Limited, UK.

E- RESOURCES

1. <https://cutt.ly/pbhDNFfx>
2. <https://www.learnpick.in/prime/documents/ppts/details/42/structures-in-c>
3. <http://www.d.umn.edu/~rmaclin/cs1622/Chapter09-10/Chapter09-10.PPT>

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DEPARTMENT OF COMPUTER SCIENCE
B.Sc., COMPUTER SCIENCE

Semester: I - CP-I: C Programming Lab

Ins. Hrs. /Week: 3

Course Credit:2

Course Code:22CS102P

OBJECTIVES

- To write, compile and debug programs in C language
- To formulate problems and implement algorithms in C
- To effectively choose programming components that efficiently solves computing problems in real-world environment

EXERCISES

1. Write a Program to convert temperature from degree Centigrade to Fahrenheit.
2. Write a Program to find whether given number is Even or Odd.
3. Write a Program to find greatest of three numbers.
4. Write a program to check alphabet, digit or special characters.
5. Write a Program to print Multiplication table of N.
6. Write a program to display the pyramid star pattern.
7. Write a Program to swap two numbers using temporary variable.
8. Write a Program to using switch statement to display Monday to Sunday.
9. Write a Program to display first Ten Natural Numbers and their sum.
10. Write a Program to find Multiplication of Two Matrices.
11. Write a Program to find the maximum number in Array using pointer.
12. Write a Program to reverse a number using pointer.
13. Write a Program to solve Quadratic Equation using functions.
14. Write a Program to String Operations(length, copy, concatenation, comparison)
15. Write a Program to find factorial of a number using Recursion.
16. Write a Program to show Call by Value and Call by Reference.
17. Write a Program to add two numbers using pointer.
18. Write a Program to create a file containing Student Details.

Total Lecture Hours:45

COURSE OUTCOME

The Students are able to

1. Apply and implement basic C Programming concepts
2. Understand and trace the execution of programs using arrays.
3. Identify the data structure to develop program for real time applications
4. Develop programs using Array and Pointers for dealing memory management
5. Implement file handling for permanent storage of data

SEMESTER II

COURSE OUTCOME

The students are able to,

1. Understand and execute C++ programs to explore the concepts of classes and objects.
2. Understand the role of polymorphism, dynamic binding and generic structures in building reusable code.
3. Understand I/O operations and file handling.
4. Apply the skills to write the C++ code using constructors and operator overloading.
5. Analyze the concepts of OOPS such as inheritance, virtual base classes and abstract classes.
6. Implement the concept of Templates and Exception handling mechanisms in C++
7. Apply OOPS concepts to solve simple data structure problems.

TEXT BOOK(S)

1. Balagursamy E 2018, Object Oriented Programming with C++, Seventh Edition, TataMcGraw Hill Publications, India.
2. Herbert Schildt 2019, C++, The Complete Reference, Fourth Edition TATA Mcgraw Hill, USA.

REFERENCE BOOK(S)

1. Ashok Kamthane 2013, Programming in C++, Pearson Education, UK.
2. Bjarne Stroustrup 2013 , C++ Programming Language, ; 4th Edition, Addison-Wesley, USA.
3. Stanley Lippman, Josée Lajoie , Barbara Moo 2012, C++ Primer , Fifth Edition, Addison-Wesley, USA .

E- RESOURCES

1. <https://cutt.ly/QbhD3Vf>
2. <https://cutt.ly/nbhD7rh>
3. http://www.cs.fsu.edu/~xyuan/cop3330/16_template.pptx

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SUNDARAKKOTTAI, MANNARGUDI- 614016
(For the Candidates admitted in the academic year 2022 – 2023)
DEPARTMENT OF COMPUTER SCIENCE B.Sc.,
COMPUTER SCIENCE

Semester: II-CP-II-Programming in C++ Lab

Ins. Hrs. /Week: 3

Course Credit:2

Course Code:22CS204P

OBJECTIVES

- To identify and practice the object-oriented programming concepts and techniques in C++
- To practice the use of C++ classes and class libraries
- To develop programs with C++ classes for simple applications

EXERCISES

1. Write a Program in C++ to display various types of arithmetic operations using mixed data type.
2. Write a program in C++ to compute quotient and remainder.
3. Write a program in C++ to input a single digit number and print a rectangular form of four columns and six rows.
- 4. Classes**
Write a Program using a class to represent a Bank Account with Data Members – Name of depositor, Account Number, Type of Account and Balance and Member Functions – Deposit Amount – Withdrawal Amount. Show name and balance. Check the program with own data.
- 5. Constructor & Destructor**
Write a program to read an integer and find the sum of all the digits until it reduces to a single digit using constructor, destructor and default constructor.
- 6. Default & Reference Argument**
Write a program using function overloading to read two matrices of different data types such as integers and floating point numbers. Find out the sum of the above matrices separately and display the total sum of these arrays individually.
- 7. Operator Overloading**
 - a) Addition of Two Complex Numbers.
 - b) Matrix Multiplication
- 8. Function Overloading**
To find the volume of cube, cuboid, Cylinder.
- 9. Inheritance**
Prepare Pay Roll of an employee using Inheritance.
- 10. Overriding**
To implement the concept of Overriding.
- 11. Templates**
Create program to add, subtract, multiply and divide two numbers using class template
- 12. Pointers**

- a. Write a Program to find the number of vowels in a given text
- b. Write a Program to check for Palindrome

13. Files

Prepare Students Mark List in a file with Student Number, Mark in four subjects and Mark Total. Write a program to arrange these records in the ascending order of Mark Total and write them in the same file overwriting the earlier records.

14. Exception Handling

- a. Prepare Electricity Bill for customers generating and handling any two Exceptions.

15. To develop a C++ Program using the following concept

- a) Virtual Functions
- b) Abstract classes

Total Hours:45

COURSE OUTCOME

The Students are able to

1. Apply object-oriented programming features in C++
2. Develop programs using Classes and objects in C++
3. Understand implementation issues related to object-oriented techniques
4. Analyze, use and create functions and overloading operators
5. Analyze programs that make appropriate use of advanced object-oriented facilities such as classes, message passing, overloading and inheritance.

SEMESTER III



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DEPARTMENT OF COMPUTER SCIENCE
B.Sc., COMPUTER SCIENCE

Semester: III -CC- III: Programming in JAVA

Ins. Hrs. /Week: 6

Course Credit: 6

Course Code:23CS305

OBJECTIVES

- To acquire the basic knowledge of programming skills in Java Language
- To understand the strengths of Java, which provide the means of writing efficient, maintainable and portable code
- To obtain knowledge in Java language with the wide variety of examples and applications

UNIT-I: The Genesis of Java

(18 Hours)

Java Language - Java's Magic: The Byte code-The Java buzzwords - Data types, Variables and Arrays- Operators-Control statements- Introducing classes: Class Fundamentals-Declaring objects- Assigning object reference variables Introducing Methods-.Constructors-The this Keyword- Garbage Collection- finalize () Method.

UNIT -II: Java Classes and I/O Streams

(18 Hours)

Inheritance: Inheritance Basics - Using super - Creating a multilevel Hierarchy - When constructors are called - Method overriding - Dynamic method dispatch - Using Abstract classes - using final with inheritance - The Object class. Input/Output: Exploring java.io: File-Directory-Stream Classes- the byte streams- the character streams

UNIT -III: Packages and Interfaces

(18 Hours)

Packages - Access protection- Importing packages – interfaces- Exception Handling: Exception Handling Fundamentals- Exception types-Uncaught Exceptions-using try and catch-user – Multiple catch Clauses-Nested try Statements-throw-throws- finally-Java's built in exceptions-Creating your own exception subclasses.

UNIT -IV: Multithread and String Handling

(18 Hours)

The Java Thread Model - Main Thread-Creating A Thread-Creating Multiple Threads- Using Is Alive() And Join()- Thread Priorities. String Handling: String Constructor Special String Operations - Character Extraction - String Comparison - Searching Strings - Modifying A String - Date Conversion Using Value Of()-String Buffer.

UNIT-V: Applet and java Beans**(18 Hours)**

The Applet Class: Applet Basics-Architecture-An Applet Skeleton- Simple Applet Display Methods- Requesting Repainting- Using The Status Window-The Html Applet Tag-Passing Parameter To Applets-Getdocumentbase() And Getcodebase()- Java Beans-Advantages Of Java Bean – Introspection- The Java Bean API

Total Lecture Hours-90**COURSE OUTCOME**

The Students are able to,

1. Understand the basic terminology used in Java programming
2. Design programs involving decision structures, loops and operators
3. Apply the concepts of Class, Inheritance, Packages and Interfaces
4. Understand the concepts of exception handling
5. Understand different Files and I/O Streams

TEXT BOOK(S)

1. Herbert Schildt, 2018, Java 2: The Complete Reference 5th edition, Tata McGraw Hill Education PvtLtd

REFERENCE BOOK(S)

1. Balagurusamy, 2014, programming with Java, 5th edition, Tata McGraw Hill Education Private Limited.
2. Yashwant Kanetkar, 2012, Let Us Java 2nd edition, BPB publications.

E-RESOURCES

1. https://www.tutorialspoint.com/java/java_tutorial.pdf
2. <https://www.slideshare.net/wanizahoor/applets-in-java>
3. <https://syr.us/kDN>
4. <https://syr.us/UHC>
5. <https://www.javatpoint.com/java-tutorial>

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(For the candidates admitted in the academic year 2022– 2023)

PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

B.Sc., COMPUTER SCIENCE

Semester: III-CP- III: Programming in JAVA Lab

Ins. Hrs. /Week: 3

Course Credit: 2

Course Code:23CS306P

OBJECTIVES

- To write, compile and debug programs in JAVA language
- To formulate problems and implement algorithms in JAVA
- To effectively choose programming components that efficiently solves computing problems in real-world environment

EXERCISES

1. Write a program to sort the given numbers using arrays.
2. Write a program to implement the FIND and REPLACE operations in the given multiple text.
3. Write a program to implement a calculator to perform basic arithmetic Operations.
4. Write a program to find the area of a rectangle using constructor
5. Write a program to find the student's percentage and grade using command line arguments.
6. Write a program to draw circle or triangle or square using polymorphism and inheritance.
7. Implement multiple inheritance concepts in java using interface, you can choose your own example of a company or education institution or a general concept which requires the use of interface to solve a particular problem.
8. Write a java program using basic package concepts.
9. Write a program to create threads and assign priorities to them
10. Write a program to develop an applet to play multiple audio clips using multithreading.
11. Write a program to create a window with three check boxes called red, green and blue. The applet should change the colors according to the selection.
12. Write a Java Program to Draw a Human Face.

Total Lecture Hours:45

COURSE OUTCOME

The Students are able to,

1. Understand the basic concept of JAVA Programming
2. Acquire knowledge about the basic concept of writing JAVA program
3. Understand the role of constants, variables, identifiers, operators, type conversion and other building blocks of JAVA Language
4. Understand the concept of inheritance and method overloading
5. Design programs using the concepts of applet

SEMESTER IV



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DEPARTMENT OF COMPUTER SCIENCE
B.Sc., COMPUTER SCIENCE

Semester: IV-CC- IV: Database Management System

Ins. Hrs. /Week: 5

Course Credit: 5

Course Code:23CS407

OBJECTIVES

- To explain the role of a database management system in an organization
- To describe the basic database concepts, including the structure and operation of the relational data model
- To illustrate the logical database design principles, E-R Diagrams, database normalization, and the role of the database administrator

UNIT- I : Introduction

(14 Hours)

Definition of Database System-Database system Applications- Purpose of Database Systems - View of Data: Physical Level, View Level, Logical Level- Database Languages: Data Definition Language-Data Manipulation Language - Relational Databases - Database Design -Data Storage and Querying -Transaction Management- Data Mining and Information retrieval - Database Users and Administrators - History of Database Systems.

UNIT- II: Relational Databases

(15 Hours)

Structure of Relational Databases - Database Schema - Keys - Schema Diagrams - Relational Query Languages - Relational Operations SQL: Overview of the SQL Query Language - SQL Data Definition: Basic Types -Basic Schema Definition. Basic Structure of SQL Queries:Queries on single relation -Queries on Multiple relation -Natural join.

UNIT- III: SQL

(15 Hours)

Additional Basic Operations- **Set Operations:** The Union operations – intersect operations-Except operations - Null Values -Aggregate Functions: Basic Aggregation-Aggregation with grouping-The having clause-Aggregation with null and Boolean values - Nested Subqueries: Set membership-set comparison-test for empty relation.-**Modification of the Database:** Deletion-Insertion-Update. Join Expressions - Transactions - Integrity Constraints.

UNIT- IV: Formal Relational Query Language

(17 Hours)

The Relational algebra: Fundamental Operations-Formal definition of the relational algebra-

Additional relational algebra operations. The Tuple Relational Calculus - The Domain Relational Calculus Database Design. Database Design and the Entity Relationship Model: Overview of the Design Process - The Entity Relationship Model – Entity Relationship Diagrams: Basic structure – Mapping cardinality -Week Entity set.

UNIT- V: Functional Dependency and Database System Applications (14 Hours)

Functional dependency -Normal form based on primary keys-Third normal form-Boyce-codd normal form(BCNF)- Indexing – Types of Indexing- B+ Tree index files -**Database System Real time Applications:** Enterprise Information, Banking and Finance, Universities, Airlines, Telecommunication

Total Lecture Hours-75

COURSE OUTCOME

The Students will be able to

1. Apply the basic concepts of Database Systems and Applications
2. Understand the basics of SQL and construct queries using SQL in database creation and interaction
3. Design a commercial relational database system by writing SQL queries
4. Analyze the concept of views transactions, views, Integrity Constraints.
5. Understand the concepts of file organization and indexing.
6. Implement the real time applications of database systems.

TEXT BOOK(S)

1. Abraham Silberschatz, Henry Korth.F, Sudarshan.S 2010, Database System Concepts, Seventh Edition, McGraw-Hill, Newyork.
2. Ramiz Elmasri, Shamkant Navathe.B 2016, Fundamentals of Database Systems, Seventh Edition Pearson Publication, London.

REFERENCE BOOK(S)

1. Lisa Friedrichsen , Lisa Ruffolo , Ellen Monk , Joy Starks.L , Philip Pratt .J 2020, Concepts of Database Management System, 10th Edition, Cengage Learning, Boston, Massachusetts
2. Raghu Ramakrishnan 2014 , Johannes Gehrke ,Database Management Systems, Third Edition, McGrawHill Education, Newyork.
3. Ramez Elmasri 2014, Database Systems: Models, Languages, Design and Application, Pearson Education, London.

E-RESOURCES

1. https://www.tutorialspoint.com/dbms/database_normalization.htm
2. <http://inst.eecs.berkeley.edu/~cs186/sp07/Spring07Lectures/25-Norm1.ppt>
3. https://www.d.umn.edu/~rmaclin/cs4611/notes/Ch08_Storage_Indexing_Overview.pdf

SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE
(AUTONOMOUS)



SUNDARAKKOTTAI, MANNARGUDI- 614016

(For the Candidates admitted in the academic year 2022 – 2023)

DEPARTMENT OF COMPUTER SCIENCE
B.Sc., COMPUTER SCIENCE

Semester: IV-CP- IV: Database Management System Lab

Ins. Hrs. /Week: 3

Course Credit:2 Course Code:23CS408P

OBJECTIVES

- To understand the MySQL operations for creating table, set operations, aggregate functions, implement nested sub queries, join operations
- To describe the database concepts for creating view and string operations
- To illustrate the concept of database creation with primary key and foreign key

EXERCISES

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. Develop mysql 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 a 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

BRANCH(branch- name:string,
branch-city:string,
assets:real)ACCOUNT(accno:int,
branch-name:string,balance:real)
DEPOSITOR(customer-
name:string, accno:int)
CUSTOMER(customer-name:string, customer-
street:string,customercity:string)LOAN(loan-
number:int, branch- name:string,amount:real)
BORROWER(customer- name:string, loan-
number:int)

- i. Create the above tables by properly specifying the primary keys and the foreign keys
- ii. Enter at least five tuples for each relation
- iii. Find all the customers who have at least two accounts at the Main branch.
- iv. Find all the customers who have an account at all the branches located in a specific city.
- v. Demonstrate how you delete all account tuples at every branch located in a specific city.
- vi. Generate suitable reports.
- vii. Create suitable front end for querying and displaying the results.

Total Lecture Hours:45

COURSE OUTCOME

The Students will be able to,

1. Develop Database tables and perform a basic MySQL operations
2. Implement MySQL commands for data definition and data manipulation
3. Obtain the skills to implement the aggregate functions
4. Obtain the knowledge to set operations, join operations, nested sub queries, views etc
5. Design database tables using primary key and foreign key

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PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

B.Sc., COMPUTER SCIENCE

Semester: IV-SBE-I : Page Maker

Ins. Hrs. /Week: 2

Course Credit: 2

Course Code:23SBECS1

OBJECTIVES

- To understand the concepts of Page maker
- To describe the different Graphic tools
- To understand about new technologies of publishing

UNIT- I: Getting Started With Adobe Page maker 7.0

(6 Hours)

Flyer-Locating Files And Fonts-Restoring Default Settings-Starting Pagemaker-Opening An Existing Publication- -Change The View Of Publication-Working with the Toolbox and Pallet-Using The Ruler-Positioning The Zero Point- Setting Up The Rulers-Planning To Print Flyer-Assembling A Two Row Column Flyers: -Producing The Flyer- Creating a new Publication.

UNIT –II: Modifying Text

(6 Hours)

Starting a Page maker-Setting An Application Default- Opening An Existing Document-Talk With Your Printer- Assembling A Custom Template- Assembling Envelope-Tilling The Publication Window-Dragging A Group From One Publication To Another- Assembling A Business Card- Copying, Pasting And Formatting The Address-Printing The Letterhead.

UNIT- III: Project Proposal

(6 Hours)

.Assembling the Third Page-Defining Printing Requirements- Creating New Publication-Creating Column Guides-Adding Tints To Color Palette-Specifying Automatic Page Numbering-Establishing A Publication Default Stroke Style And Weight-Creating The Rotated Display Text-Replacing Selected Text- Assembling The First Page- Assembling The Second Page- Assembling The Third Page-Producing The Proposal

UNIT- IV : Jewel Case Booklet

(6 Hours)

Before You Begin- Assembling The Master Page- Assembling The Booklet Cover- Assembling The First Double Page Spread - Assembling The Second Double-Page Spread - Assembling The Last Spread - Assembling The Back Cover – Building a Booklet Printing the Booklet.

UNIT- V: Adventure Newsletter

(6 Hours)

Before You Begin - Starting The Publication- Setting Up The Master Pages- Beginning Page 1 -Adding Guides -Placing Art On Page 1 - Placing The Text- Formatting The Bungee Article - Adding The Continuation Line- Adding The Editor's Note- Finishing The Bungee Article- Formatting The Kayaking Article Positioning The Pull Quote- Laying Out The Tibetan Treks Sidebar- Using The Story Editor-Finding And Changing Text -Checking Spelling.

COURSE OUTCOME

The Students are able to

1. Understand the basic concepts of PageMaker
2. Analyze how to modify and create text style
3. Create graphics with multiple colors
4. Comprehend new technologies in page maker
5. Understand the concepts of internet and intranet

TEXT BOOK(S)

1. Adobe Press 2012, Adobe Page Maker 7.0 Classroom Guide, Adobe Press, Canada.
2. Kevin Proot 2014, Adobe Pagemaker 7.0. Cengage Learning ,USA.

REFERENCE BOOK(S)

1. Carolyn M. 2002, The Complete Reference. Pagemaker 7, McGraw-Hill, USA
2. Greg Bowden 2002, Learning Adobe Pagemaker 7.0, Guided Computer Tutorials, Australia.
Scott Basham 2002, Pagemaker In Easy Steps. Dream Tech Press, New Delhi.

E-RESOURCES

1. <https://www.slideshare.net/lakshmirama/pagemaker65-ppt>
2. <https://www.youtube.com/watch?v=ud0htk5jiz0>
3. <http://ncsmindia.com/wp-content/uploads/2012/04/dtp4.pdf>
4. https://www.bestlibrary.org/journalism/files/using_pagemaker_7_text_doc..pdf
5. <https://www.r-iti.com/download/pagemakernotes.pdf>

SEMESTER V



SENGAMALA THAYAAR EDUCATIONAL TRUST WOMEN'S COLLEGE

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PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

B.Sc., COMPUTER SCIENCE

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

Ins. Hrs./Week: 6

Course Credit:6

Course Code:R23CS509

OBJECTIVES

- To impart the basic concepts of data structures and algorithms
- To understand concepts about searching and sorting techniques
- To understand basic concepts about stacks, queues, lists, trees and graphs

UNIT- I: Data Structure Fundamentals

(18 Hours)

Arrays and sequential representations – Ordered lists –Difference between sequential and ordered list – Stacks and Queues – Applications of stack and Queue - Evaluation of Expressions – Multiple Stacks and Queues – Singly Linked List – Linked Stacks and queues – Polynomial addition.

UNIT- II: Trees

(18 Hours)

Introduction – Binary tree representations – Tree Traversal – Threaded Binary Trees – Binary Tree Representation of Trees – Graphs and Representations – Traversals- Connected Components and Spanning Trees – Shortest Paths.

UNIT- III: Algorithms

(17 Hours)

Definition- Characteristics - Pseudo Code Conventions-Algorithm analysis-Algorithm Complexity – Priority Queues - Heaps – Heap Sort – Merge Sort – Quick Sort – Binary Search – Finding the Maximum and Minimum.

UNIT- IV: Greedy Method

(19 Hours)

The General Method – Greedy Method Control Abstraction for subset paradigm-Tree vertex splitting- Optimal Storage on Tapes – Knapsack Problem – Job Sequencing with Deadlines – High level Description of Job Sequencing Algorithm-Sequencing Unit Time Jobs with Deadlines and profits- Fast Job Scheduling-Optimal Merge Patterns.

UNIT –V: Back tracking

(18 Hours)

The General Method – n Queens Problem- 8 Queens Problem – N Queens Problem- Recursive Backtracking - Iterative Backtracking - Sum of Subsets – Graph Coloring - Planar Graph Representation - m colorings of a Graph - Hamiltonian cycle.

Total Lecture Hours-90

COURSE OUTCOME

Students are able to

1. Write algorithms step by step in solving problems with the help of fundamental data structures
2. Analyze algorithm and algorithm correctness
3. Summarize searching and sorting techniques
4. Describe stack, queue and linked list operation
5. Understand the concepts of tree and graph

TEXT BOOKS

1. Ellis Horowitz, Sartaj Sahni 2008, Fundamentals of Data Structure, Galgotia Publications, New Delhi.
2. Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran 2008, Computer Algorithms, University Press, Hyderabad.

REFERENCE BOOKS

1. John Bullinaria 2019, Data Structures and Algorithms, Version 27 , University of Birmingham, UK.
2. Narasimha Karumanchi 2017, Data Structures and Algorithms Made Easy, 5th Edition, Career Monk Publication, Hyderabad.
3. Seymour Lipschutz 2014, Data Structures , Tata Mcgraw Hill, Schaum's Outline Series, India.

E-RESOURCES

1. https://drive.google.com/file/d/17uKRbJfApOLMQtw6wjlST8Q6ga-3rYG5/view?usp=drive_web
2. <https://www.slideshare.net/adishesha12/data-structure-ppt-138483078>



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PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE
B.Sc., COMPUTER SCIENCE

Semester: V -CC-VI : Computer System and Networks

Ins. Hrs. /Week: 6

Course Credit:6

Course Code:R23CS510

OBJECTIVES

- To understand the design and organization of Computer Networks
- To analyze the fundamental Layers of Networks
- To understand the real world applications of computer networks

UNIT- I: Introduction

(17 Hours)

Data Communications: Components, Data Representation, Data Flow- Networks: Network criteria, Physical structures - Network Types: LAN, WAN, Switching, The Internet-**Network Models: TCP/IP Protocol Suite - The OSI Model. Physical Layer: Multiplexing: FDM, WDM, TDM - Spread Spectrum: FHSS, DSSS-Transmission Media: Guided Media-Unguided Media.**

UNIT- II: Data Link Layer

(17 Hours)

Introduction to Error Deduction and Correction: – Block Coding- Linear Block Codes- Cyclic codes- Checksum- **Data link Control: DLC Services: Framing, Flow and Error Control, Connectionless and connection-oriented - Data-Link Layer Protocols: Simple Protocol, Stop and Wait Protocol, Piggybacking.**

UNIT- III: Wireless Networks

(19 Hours)

IEEE 802.11: Architecture, MAC Sublayer, Addressing Mechanism, Physical Layer- Bluetooth: Architecture, Bluetooth Layers-Cellular Telephone: Operation, 1G, 2G, 3G, 4G- Satellite networks: Operation, GEO Satellites, MEO Satellites, LEO Satellites- Connecting devices: Hubs, Switches, Routers.

UNIT -IV: Transport Layer

(17 Hours)

Process-To-Process Delivery-Transport Layer Protocols- User Datagram Protocol - User Datagram - Checksum - TCP Services- TCP features - Windows in TCP - Flow Control - Error Control- TCP Congestion Control Data Traffic- Congestion-Congestion Control- Quality of Service - Techniques to Improve Quality of Service- Integrated Services.

UNIT- V: Session Layer

(19 Hours)

Client Server Programming: API, Using Services of the transport layer, Iterative Communication using UDP & TCP, Concurrent communication - World Wide Web - HTTP- File Transfer Protocol- Electronic mail: Architecture, Web based mail, E_ Mail security- Domain Name System.

Total Lecture Hours-90

COURSE OUTCOME

Students are able to

1. Identify the Networks types, models and OSI layers
2. Understand the Data link layer and working of connection devices
3. Understand about the Addressing modes
4. Understand the TCP Services and Features
5. Obtain the knowledge in WWW, FTP, Email

TEXT BOOKS

1. Behrouz Forouzan 2013, A Data Communications and Networking, , Tata McGrawHill, Fifth Edition, NewDelhi, India.
2. Larry Peterson.L and Bruce Davie.S 2006, Morgan Computer Networks, KaufmannPublishers , Burlington, Massachusetts, USA.

REFERENCE BOOKS

1. Achyut Godbole and Atul Kahate 2011, Data Communications and Networks, McGraw Hill Education, New Delhi, India.
2. Andrew Tennabaum.S 2013, Computer Networks, Fifth Edition Pearson Publication, India.
3. James Kurose .F, Keith Ross.W 2016. Computer Networking , A Top down Approach,Sixth Edition Pearson Publication, India.

E-RESOURCES

1. <https://www.albany.edu/~goel/classes/fall2002/msi603/notes/osi.ppt>
2. <http://index-of.es/Varios-2/Computer%20Networks%205th%20Edition.pdf>

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PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

B.Sc., COMPUTER SCIENCE

Semester: V-CC- VII: Python Programming

Ins. Hrs. /Week: 5

Course Credit: 5

Course Code:R23CS511

OBJECTIVES

- Describe the core syntax and semantics of Python programming language.
- Discover the need for working with the strings and functions.
- Illustrate the process of structuring the data using lists, dictionaries, tuples and sets.
- Understand the usage of packages and Dictionaries

UNIT-I: Introduction

(11 Hours)

The essence of computational problem solving – Limits of computational problem solving-Computer algorithms-Computer Hardware-Computer Software-The process of computational problem solving- Python programming language - Literals - Variables and Identifiers - Operators - Expressions and Data types, Input / output.

UNIT-II: Control Structures

(18 Hours)

Boolean Expressions - Selection Control - If Statement- Indentation in Python- Multi-Way Selection - Iterative Control- While Statement- Infinite loops- Definite vs. Indefinite Loops- Boolean Flag. String, List and Dictionary, Manipulations Building blocks of python programs, Understanding and using ranges.

UNIT-III : Functions

(18 Hours)

Program Routines- Defining Functions- **More on Functions:** Calling Value-Returning Functions- Calling Non-Value-Returning Functions- Parameter Passing - Keyword Arguments in Python - Default Arguments in Python-Variable Scope. **Recursion:** Recursive Functions.

UNIT-IV: Objects and their use

(18 Hours)

Software Objects - Turtle Graphics – Turtle attributes-Modular Design: Modules - Top-Down Design - Python Modules - Text Files: Opening, reading and writing text files – Database Programming: Connecting to a database, Creating Tables, INSERT, UPDATE, DELETE and READ operations, Transaction Control, Disconnecting from a database, String Processing - Exception Handling.

UNIT-V: Dictionaries and Sets

(10 Hours)

Dictionary type in Python - Set Data type. Object Oriented Programming using Python: Encapsulation - Inheritance – Polymorphism. Python packages: Simple programs using the built-in functions of packages matplotlib, numpy, pandas etc.

Total Lecture Hours-75

COURSE OUTCOME

Students are able to

1. Develop and Execute simple python programs.
2. Write simple Python programs using conditionals and looping for solving problems.
3. Decompose a Python program into functions.
4. Represent compound data using Python lists, tuples, dictionaries etc.
5. Read and write data from/to files in Python programs.

TEXT BOOKS

1. Charles Dierbach, “Introduction to Computer Science using Python - A computational Problem solving Focus”, Wiley India Edition, 2015.
2. Wesley J. Chun, “Core Python Applications Programming”, 3rd Edition , Pearson Education, 2016.

REFERENCE BOOKS

1. Mark Lutz, “Learning Python Powerful Object Oriented Programming”, O’reilly Media 2018, 5th Edition.
2. Timothy A. Budd, “Exploring Python”, Tata MCGraw Hill Education Private Limited 2011, 1 st Edition.
3. John Zelle, “Python Programming: An Introduction to Computer Science”, Second edition, Course Technology Cengage Learning Publications, 2013, ISBN 978- 1590282410
4. Michel Dawson, “Python Programming for Absolute Beginners” , Third Edition, Course Technology Cengage Learning Publications, 2013, ISBN 978-1435455009

E-RESOURCES

1. <https://padeepz.com/course/problem-solving-python-programming-ge8151-semester-1-regulation-2017-anna-university/>
2. <https://www.greenteapress.com/thinkpython/thinkCSPy.pdf>
3. <https://rb.gy/a9vfsw>
4. https://onlinecourses.swayam2.ac.in/cec22_cs20/preview



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PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

B.Sc., COMPUTER SCIENCE

Semester: V-CP-V: Python Lab

Ins. Hrs. /Week: 3

Course Credit: 3

Course Code:R23CS512P

OBJECTIVES

- To develop programs using the concepts of variables and functions in python
- To understand the use of python data structures such as lists, tuples, dictionaries
- To obtain the knowledge about input/output files in python

EXERCISES

1. Write a program to check whether the given string is Symmetrical or Palindrome
2. Write a program to find the size of a Tuple
3. Write a program to find the sum of all items in a dictionary
4. Write a program to get the largest number from a list
5. Write a program that take command line arguments
6. Write a program to check file size in python
7. Write a program to read an entire text file
8. Write a program to display the various date time formats
 - (a) Current data and time
 - (b) Current year
 - (c) Month of year
 - (d) Week number of the year
 - (e) Weekday of the Week
 - (f) Day of year
 - (g) Day of the Month
 - (h) Day of Week
9. Write a program to convert temperatures to and from Celsius, Fahrenheit
10. Write a program for binary search
11. Write a python program by using exception handling mechanism.
12. Write a Python program to create a table and insert some records in that table. Finally selects all rows from the table and display the records.

COURSE OUTCOME

Students are able to

1. Understand the basic concepts of Python programming
2. Develop the simple programs in Python
3. Design programs using loops and decision statements in Python
4. Understand read and write operations in files
5. Use exception handling in Python applications for error handling



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PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

B.Sc., COMPUTER SCIENCE

Semester: V-MBE-I: Software Engineering

Ins. Hrs. /Week:4

Course Credit:4

Course Code:R23MBECS1:1

OBJECTIVES

- To understand the software process and models
- To describe the requirement analysis and software design
- To study the object oriented concepts, software coding and Web Engineering

UNIT –I: Introduction

(12 Hours)

Introduction to Software Engineering - Software Process - Software Process Models - Software Model - **Requirements Engineering Principles** : Requirements Engineering - Importance of Requirements - **Types of Requirements**: Feasibility Study- Requirement Gathering-Software requirement Specification-Software Requirement Validation- Steps involved in Requirements Engineering.

UNIT- II: Requirements Analysis Modeling

(12 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 vs Object Oriented System – Modularity- Cohesion- Coupling -Layering - Real Time Software Design - Design Models - Design Documentation.

UNIT- III: Object Oriented Concepts

(13 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 and Configuration

(12 Hours)

Software Coding: Introduction-Programming Principles-Programming Guidelines-Coding Conventions-Key Concepts in software coding- Introduction to Software Measurement and Metrics - Software Estimation Tools, Techniques and Models - Software Configuration - Project Management Introduction

UNIT- V: Software Testing and Web Engineering**(11 Hours)**

Software Testing: Introduction to Software Testing-Types of Software Testing-Functional Software Testing- Non-Functional Software Testing - Software Maintenance-Introduction to Web - General Web Characteristics - Web Application Categories - Working of Web Application - Advantages and Drawbacks of Web Applications - Web Engineering - Emerging Trends in Software Engineering

Total Lecture Hours-60**COURSE OUTCOME**

Students are able to

1. Implement the concepts of software engineering
2. Understand the Design and Architectural Engineering
3. Describe about Object Oriented Concepts
4. Understand about Software coding and Configuration
5. Learn about Emerging Trends in Software Engineering

TEXTBOOKS

1. Prof.Aggarwal.K.K, Prof. Yogesh Singh 2019, Software Engineering, New Age International (P) Ltd., Publishers, New Delhi, India.
2. Chandramouli Subramanian, Saikat Dutt, Chandramouli Seetharaman, Geetha.B.G 2015, Software Engineering, Pearson Publications, London.

REFERENCE BOOKS

1. Jibitesh Mishra 2011 , Software Engineering, Pearson Education, London.
2. Ian Sommerville 2017, Software Engineering, Tenth edition , Pearson Education, London.
3. Pressman 2004, Software Engineering, 6th Edition , McGraw-Hill Education , India.

E-RESOURCES

1. https://www.tutorialspoint.com/software_engineering/Software_engineering_pdf_version.htm.
2. <https://www.youtube.com/watch?v=Z6f9ckEEIsU>.

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PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

B.Sc., COMPUTER SCIENCE

Semester: V - MBE - I: Digital Electronics and Microprocessor

Ins. Hrs. /Week: 4 Course Credit:4 Course Code:R23MBECS1:2

OBJECTIVES

- To understand the role of Number system and codes
- To be familiar with the concepts of Boolean algebra, DeMorgan's Theorem, Karnaugh Maps
- To obtain knowledge about the Combinational Logic Circuits and Sequential Logic Circuits

UNIT -I : Number Systems and Codes (12 Hours)

Introduction to Number systems-Types of Number Systems-Binary Number System-Decimal Number System-Hexadecimal Number System-Octal Number System - Binary to Decimal Conversion - Decimal to Binary Conversion - Octal Numbers - Hexadecimal Numbers - Binary Codes - **Logic Gates and Circuits:** AND, OR, NOT, NAND, NOR, Exclusive OR and Exclusive NOR Gates.

UNIT -II: Boolean Algebra (12 Hours)

Definitions - Fundamentals of Boolean Algebra - Boolean Functions - Minterms and Maxterms - Laws and Theorems of Boolean Algebra - DeMorgan's Theorem - Simplifying Logic Circuits- Sum of Products - AND-OR Networks - Sum of Products and Product of Sums Forms - Karnaugh Maps and Tabulation method - Product of Sums Simplification - NAND and NOR Implementation - Don't Care Conditions - Overlapping Groups - Rolling the Map - Eliminating Redundant Groups.

UNIT- III: Combinational Logic Circuits (14 Hours)

Introduction - Adders - The Half Adder - The Full Adder - Subtractors- BCD Adder - Multiplexers- Demultiplexers - Decoders - Encoders - **Flip Flops:** RS Flip Flop - Clocked RS Flip Flop- D Flip Flop - JK Flip Flop - T Flip Flop - Shift Registers- **Sequential Logical Circuit:** Counters - Asynchronous or Ripple Counter - Ring Counter.

UNIT- IV : Introduction to Microprocessor (12 Hours)

Features of Microprocessor-Evolution of Microprocessor- Classification of microprocessor- Applications of Microprocessor - Single chip Microcomputer-Microprocessor Applications -Buses-Memory Addressing capacity and CPU - Microcomputers- Processor Architecture-Pin Configuration of Microprocessor - Intel 8085 - Instruction cycle - Timing Diagram.

UNIT V: Instruction Set of Intel 8085**(10 Hours)**

Instruction and Data Format – **Address Modes:** Immediate Addressing- register Addressing-Register Indirect Addressing-Implicit Addressing – **Status Flags:** Carry Flag-Auxiliary Carry Flag-Sign Flag-Parity Flag-Zero Flag– Intel 8085 instruction - Programming Microprocessor – Assembly language – Assembler-Types of Assembler-Difference between assembler and Compiler.

Total Lecture Hours-60**COURSE OUTCOME**

Students are able to

1. Acquire the knowledge about the number system and codes
2. Understand the basics of Boolean Algebra, Demorgan's theorem K-Map
3. Analyze the concepts multiplexer, demultiplexer, sequential logic circuits
4. Understand the evolution of microprocessor, Assembler, Instruction set of Intel 8085
5. Comprehend the concepts of Address modes, Programming Microprocessor, status flags

TEXT BOOKS

1. Badri Ram 2012, Fundamentals of Microprocessors and Microcomputers, Eighth Edition, Dhanpat Rai Publications, New Delhi.
2. Dr. Meena. K 2009, Principles of Digital Electronics, PHI Learning Private Limited, New Delhi.

REFERENCE BOOKS

1. Morris Mano. M 2010, Digital Logic Design, Pearson Education, London.
2. Dr. Narendra Jadav. S, Dr. (Mrs). Alpna Adsul P 2018, Digital Electronics and Microprocessor, First Edition, Nirali Prakashan, Pune, .
3. Senthil Kumar Saravanan, Jeevananthan 2010, Microprocessors and Microcontrollers, Oxford Univ Press, England.

E-RESOURCES

1. https://www.tutorialspoint.com/digital_circuits/digital_circuits_k_map_method.htm
2. https://www.tutorialspoint.com/digital_circuits/digital_circuits_sequential_circuits.htm
3. <http://sigc.edu/department/mca/studymet/Intel8085.pdf>

SENGAMALA THAYAR EDUCATIONAL TRUST WOMEN'S COLLEGE



(AUTONOMOUS),

SUNDARAKKOTTAI, MANNARGUDI – 614016.

(For the candidates admitted in the academic year 2022 – 2023)

PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

B.Sc., COMPUTER SCIENCE

Semester: V-SBE- II: Corel Draw

Ins. Hrs. /Week: 2

Course Credit: 2

Course Code:R23SB ECS2

OBJECTIVES

- To understand the concepts of Corel Draw
- To understand about the concept of multiple images
- To create images and background with multiple colors

UNIT- I: Corel Draw Basics

(6 Hours)

Interfacing With Corel draw- Essential Object Commands- Launching Corel draw- Creating A New Document-Opening Document-Importing Graphics and Text- Saving Drawings-Making Backup Files- Export Drawings-Closing Documents- Quitting Corel draw.

UNIT –II: Drawing and Selecting

(6 Hours)

Drawing Menus- Very First Drawing—Saving the Drawing-Closing The Drawing-Opening The Existing Drawing-Opening And Saving Files- Measuring And Drawing Helpers-Zooming And Viewing- Options In Drawing Menu- Colors-Color Palettes

UNIT- III: Working With Text

(6 Hours)

Adding Text To A Document-Text Formatting-Importing Text-Text Layouts- Text Special Effect-Skewing And Rotating Text – Create Drop Shadows – Fitting Text To A Path- Extruding Text- The Neon Effect - Font Styles- Creating Standard Text Formats- Applying The Text Formats.

UNIT- IV: Working With Images

(6 Hours)

Image Formatting- Alignment-Create Image Gallery- Using Images From Image Library- Using Images As Styles - Working With Rectangles- Working With Ellipses-Select, Move, Copy And Ellipses-Selecting Objects-Moving Objects- Copying Objects-Resizing Objects- Deleting Objects.

UNIT- V: Page Layout and Background

(6 Hours)

Setting Page Size and Orientation- Setting A Page Background- Adding Pages- Deleting Pages-Document Navigation- View Document Info- Page Layout Styles- Applying Page Layout Styles- Page Layout Menu-Applying Color To Pages-Solid Color Fills And Outlines.

Total Lecture Hours-30

COURSE OUTCOME

Students are able to

1. Understand the basic concepts of COREL DRAW
2. Work with drawing tools
3. Apply the text formats and styles
4. Implement image formatting and graphics
5. Understand the concepts of page layouts

TEXT BOOKS

1. Steve Schwartz And Phyllis Davis 2003, Corel draw 11 For Window, Pearson Education,England.
2. Vikas Gupta 2009, DTP Course Kit. Dream tech Press, New Delhi.

REFERENCE BOOKS

1. Gary David Bouton 2014, Corel draw X7: The Official Guide, Corel Corporation, London.
2. Satish Jain/Geetha.M 2018, Corel Draw Training Guide, Bpb Publications, New Delhi.
3. Steve Bain 2014, Coreldraw 12: The Official Guide. Dreamtech Publications, New Delhi.

E-RESOURCES

1. <https://www.slideshare.net/ienock/introduction-to-corel-draw>
2. <https://vdocument.in/introduction-to-corel-draw.html>
3. <https://www.youtube.com/watch?v=tpbfhcevnpv>
4. <https://www.coreldraw.com/en/learn/tutorials/>
5. <https://www.javatpoint.com/coreldraw>

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PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

B.Sc., COMPUTER SCIENCE

Semester: V-SBE-III: Dream Weaver

Ins. Hrs. /Week: 2

Course Credit: 2

Course Code: R23SBEC2

OBJECTIVES

- To understand the concepts of dream weaver
- To describe about working with webpages and CSS
- To create images and background with Java script

UNIT- I: Introduction To Dreamweaver Cs4

(6 Hours)

Creating New Webpages-Creating New Templates For Web Pages-Working With Dreamweaver Websites-Setting Up Dreamweaver Sites- Understanding Remote And Local Folder Structure-Using Site Maps-Working With Webpage With Out Defining A Sites-Understanding Basic Tab Option.

UNIT- II: Working With Web Pages

(6 Hours)

Designing Your First Webpage-Setting Page Properties-Working With Links-Linking Pages-Using Jump Menu-Navigation Bar-Image Maps- Working With HTML Tables- Creating HTML Tables- Creating Tables In Standard Mode-Applying Table For Spacing And Alignment-Framesets And Frames.

UNIT- III: Introduction To Cascading Style Sheets

(6 Hours)

Creating Styles- Defining Styles-Elements Of Style- Linking a style to an HTML document-Inline Stylesheet-External Stylesheets-Internal Stylesheets- Understanding CSS Style Panel- CSS Rules - Creating New CSS Rule-Working With External CSS Files-Formatting CSS Code-Working With CSS Layouts-Applications of CSS.

UNIT- IV: Working With Templates

(6 Hours)

Templates-Creating Dream Weaver Template-Creating Editable Region- Creating Repeating Regions- Using Optional Region- Working With Flash Contents and HTML Forms-Dreamweaver and Flash- Managing Extension in Dreamweaver- HTML Form Control.

UNIT -V: Working With Java script

(6 Hours)

Working With Java script Behaviors- Finalizing The Site-Using Browser Compatibility Feature-Working With Broken Links-Publishing The Website-Changing Local And Remote Sites-Setting Cloaking Option-Site Management.

Total Lecture Hours-30

COURSE OUTCOME

Students are able to

1. Understand the basic concepts of Dream Weaver
2. Work with webpages and HTML tables
3. Illustrate the concept of CSS
4. Work with flash contents and HTML forms
5. Design website using Javascript

TEXT BOOKS

1. Kogent Learning, 2010, Dreamweaver CS4 In Simple Steps, Kogent Learning Solutions Inc, Dreamtech Press, New Delhi.
2. Joseph Lowery 2012, Adobe Dreamweaver CS6 Bible, Wiley publications, USA.

REFERENCE BOOKS

1. Adobe press 2019. Adobe Dreamweaver CC, Adobe press, USA.
2. Reina Luz Alegre 2020. The Dream Weaver, Simon & Schuster Books For Young Readers, New York.
3. Su Williams 2014. Dream Weaver, Create space independent publications, USA

E-RESOURCES

1. <https://www.slideshare.net/9869265428/adobe-dreamweaver-55850463>
2. <https://web.cs.dal.ca/~tt/ECMM6010/presentations/Dreamweaver.ppt>
3. <https://syr.us/61W>
4. <https://syr.us/Kml>
5. <https://syr.us/hj>



BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI - 24.
UNDER GRADUATE DEGREE PROGRAMMES

SOFT SKILLS DEVELOPMENT 23UGSDC

Learning Objective

Today's world is all about relationship, communication and presenting oneself, one's ideas and the company in the most positive and impactful way. This course intends to enable students to achieve excellence in both personal and professional life.

Unit I

Know Thyself/ Understanding Self

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

Unit II

Interpersonal Skills/ Understanding Others

Developing interpersonal relationship-Team building-group dynamics-Net working Improved work relationship

Unit III

Communication Skills / 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 / Working with Others

Developing body language-Practicing etiquette and mannerism-Time management Stress management

Unit V

Selling Self / Job Hunting

Writing resume/cv-interview skills-Group discussion- Mock interview-Mock GD – Goal setting - Career planning

TEXT BOOKS:

Meena.K and V.Ayothi (2013) A Book on Development of Soft Skills (Soft Skills : A Road Map to Success), P.R. Publishers & Distributors, No, B-20 & 21, V.M.M. Complex, Chatiram Bus Stand, Tiruchirappalli- 620 002.
(Phone No: 0431-2702824: Mobile No: 94433 70597, 98430 74472)

Alex K. (2012) Soft Skills – Know Yourself & Know the World, S.Chand & Company LTD, Ram Nagar, New Delhi- 110 055. Mobile No : 94425 14814 (Dr.K.Alex)

REFERENCE BOOKS:

- (a) Developing the leader within you John c Maxwell
- (ii) Good to Great by *Jim Collins*
- (iii) The seven habits of highly effective people Stephen Covey
- (iv) Emotional Intelligence Daniel Goleman
- (v) You can win Shive Khera
- (vi) Principle centred leadership Stephen Covey

SEMESTER VI



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PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

B.Sc., COMPUTER SCIENCE

Semester: VI -CC- VIII: Operating Systems

Ins. Hrs. /Week:6

Course Credit:6

Course Code:R23CS613

OBJECTIVES

- To understand the basic concepts and functions of operating systems
- To analyze various memory management schemes
- To illustrate the Processes and the concept of Deadlocks, Scheduling algorithms, I/O management and File systems

UNIT –I: Introduction

(12 Hours)

Evolution of operating systems- Serial Processing - Batch Processing - Multi Programming-
Functions of OS: Memory Management Functions - Processor / Process Management Functions - Device Management Functions - Information Management Functions – **Types of Operating Systems:** Batch Operating System-Multi Programming Operating System - Multitasking Operating System - Multi-user Operating System - Multithreading - Time Sharing System - Real Time Systems – Interrupt Structure & processing.

UNIT -II: Memory Management

(23 Hours)

Single Contiguous Allocation- Partitioned Allocation – Relocatable Partitions allocations – Paged Memory Management- Demand paged Memory Management –Page Removal Algorithms -FIFO-LRU- **Virtual Memory Management:** Segmented Memory Management – Segmented and Demand paged Memory Management – Other Memory Management Techniques-overlay Techniques – Swapping.

UNIT -III: Processor Management

(20 Hours)

Job Scheduling –Job Scheduling functions & Policies - Process Scheduling – Process Scheduling Functions and Policies – Evolution of Round Robin Multiprogramming Performance – Process Synchronization – Wait and Signal mechanisms – Semaphores - P & V Operations – Deadlock-Deadlock Prevention-Deadlock Detection- Banker's Algorithm.

UNIT -IV: Device Management

(20 Hours)

Techniques for Device Management-Dedicated, Shared and Virtual – Device characteristics-Serial Access Devices - Completely Direct Access - Direct Access Storage device- Magnetic disks -Optical

Discs-Flash memory - I/O Traffic Controller, I/O Scheduler, I/O Device Handlers – Communication among Devices-Management of I/O Requests.

UNIT- V: Information Management

(15 Hours)

File system model – Symbolic File System- Basic file system - Access Control verification - General Model of a File System-Sequential Access-Direct/Random Access- Indexed sequential Access- Physical File System and Logical File System -Allocation strategy Module-Device Strategy Modules.

Total Lecture Hours-90

COURSE OUTCOME

Students are able to

1. Understand the evolution of operating system
2. Compare and contrast the various memory management schemes
3. Analyze various scheduling algorithm, deadlock prevention and avoidance algorithms
4. Understand the concept of device management
5. Describe the concepts of file management systems

TEXT BOOKS

1. Dhamdhare D.M , System Programming and Operating Systems –Tata McGraw Hill Publishing Co.,Limited, New Delhi.
2. Madnick.S.E and Donovan J J 2013, —Operating Systems|| McGraw Hill International Book Co.,New Delhi.

REFERENCE BOOKS

1. Dhamdhare .D.M, —Operating Systems: A Concept-Based Approach||, McGraw Hill Education; NewDelhi.
2. Harvey Deitel M, 1984, —An Introduction to operating system|| Addison - Wesley Publishing Co.New York.
3. James Peterson.L & Abraham Silbertschatz, 1987, —An Introduction to operating system|| Addison -Wesley Publishing Co. New York.

E-RESOURCES

1. https://www.tutorialspoint.com/operating_system/index.htm
2. <http://www.ddegjust.ac.in/studymaterial/mca-5/mca-105.pdf>
3. <http://www.freebookcentre.net/ComputerScience-Books-Download/Notes-on-Operating-Systems.html>
4. <http://www.freebookcentre.net/ComputerScience-Books-Download/Operating-Systems-Lecture-Notes-by-Stanford-University.html>
5. <http://www.freebookcentre.net/ComputerScience-Books-Download/Lecture-Notes-On-Operating-Systems-Mrs.-Sk-Abeeda.html>

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PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

B.Sc., COMPUTER SCIENCE



Semester: VI-CC- IX: Programming in PHP

Ins. Hrs. /Week:6

Course Credit:6

Course Code:R23CS614

OBJECTIVES

- To understand the Concepts of PHP
- To describe the concepts of functions in PHP
- To obtain knowledge in advance object oriented programming and file handling

UNIT- I : Essentials of PHP

(19 Hours)

Getting PHP-Creating a First PHP Page-Mixing HTML and PHP-Using PHP —Here Documents-Command Line PHP- Working with Variables –Creating constants-**Operators and Flow control:** PHP's Math operators-The PHP String Operators-Operators in PHP-PHP Operator Precedence-Decision making statements-Looping Statements-**Strings and Arrays:** The String Functions-Building Arrays-Handling Arrays with Loops-The PHP Array Functions-Sorting Arrays-Handling Multidimensional Arrays-Other Array Functions.

UNIT –II: Creating Functions

(18 Hours)

Creating functions in PHP-Passing by Reference-Returning Data From Functions- Using Default Arguments- Introducing Variable Scope in PHP-Nesting Functions- **Reading Data in Web Pages:** Setting Up Web Pages to Communicate with PHP-Handling Controls-Handling File Uploads-Handling Buttons - **PHP Browser Handling Power:** Using PHP's Server Variables-Using HTTP Headers-Handling From Data with Custom Arrays- Performing Data Validation-Client Side Data Validation .

UNIT- III: Object-Oriented Programming

(18 Hours)

Creating Classes and Objects–Setting Access to Properties and Methods-Constructors-Destructors-Basing One Class on Another with Inheritance-Overriding methods-Overloading Methods-Auto loading Classes-**Advanced Object Oriented Programming :** Creating Static Methods-Abstract Classes-Creating Interfaces-Creating Class Constants-Using Final Keyword-Cloning Objects .

UNIT -IV : File Handling

(18 Hours)

Opening Files Using fopen -Reading a file Content-Closing a file –Writing a file with write –Locking Files-**Working with Databases:** Creating a MySQL Database-Creating a Table-Accessing the Database in PHP-Updating Databases -Inserting New Data Items into a Database– **Sessions, Cookies, and FTP:** PHP Cookie-Setting Cookies' Expiration-Working FTP- Sending E-mail-Storing Data in Sessions.

UNIT -V: AJAX

(17 Hours)

Getting Started with Ajax-Writing Ajax-Creating the XML Http Request Object – Opening the XML Http Request Object –Handling Downloaded Data- Ajax with Some PHP-Passing Data to the Server with GET and POST Methods- Handling XML– **Drawing Images on the Server:** Creating an Image-Displaying Images in HTML Pages-Drawing Lines-Drawing Rectangles-Drawing Arcs-Drawing Polygons-Filling in figures-Drawing Text.

Total Lecture Hours-90

COURSE OUTCOME

Students are able to

1. Analyze the essentials of PHP
2. Understand about the functions in PHP
3. Describe about file handling methods in PHP
4. Implement various MySQL Database query
5. Understand the advanced concept AJAX

TEXT BOOKS

1. Gopalan N.P, Akilandeswari.J 2008, ||Web Technology|| A Developer's Perspective, Prentice Hall of India Private Limited, New Delhi.
2. Steven Holzner 2007, The PHP Complete Reference McGrawHillEducation, New Delhi,India.

REFERENCE BOOKS

1. Rajinder Kumar, Gunjan Gupta 2020. Web Development using PHP , First Edition,ISHAN Publications, Ambala, Haryana 134003,India.
2. Robin Nixon, —Learning PHP, MySQL &JavaScript With jQuery, CSS & HTML5|| O'Reilly Publications, California, USA.
3. Vikram Vaswani 2008, PHP: A Beginner's Guide, Fourth Edition, McGraw Hill Education, New Delhi, India.

E-RESOURCES

1. https://www.tutorialspoint.com/php/php_tutorial.pdf
2. <https://www.slideshare.net/hemaprasanth/ajax-ppt-4410119>

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(For the candidates admitted in the academic year 2022 – 2023)

PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

B.Sc., COMPUTER SCIENCE



Semester: VI-CP-VI: Programming in PHP Lab

Ins. Hrs. /Week: 5

Course Credit: 4

Course Code:R23CS615P

OBJECTIVES

- To impart practical training in PHP Programming Language
- To design webpages using user defined function
- To develop programs using session and cookies

EXERCISES

1. Write a program to find the factorial of a number.
2. Write a program using Conditional Statements.
3. Write a program to find the maximum value in a given Multidimensional array.
4. Write a program to find the GCD of two numbers using user-defined functions.
5. Design a simple web page to generate multiplication table for a given number.
6. Design a web page that should compute one's age on a given date.
7. Write a program to download a file from the server.
8. Write a program to store the current date and time in a COOKIE and display the `__LastVisited` date and time on the web page.
9. Write a program to store page views count in SESSION, to increment the count on each refresh and to show the count on web page.
10. Write a program to design a simple calculator.
11. Write a program to draw the human face.
12. Design an authentication web page in PHP with MySQL to check username and password.
13. Write a PHP program to generate menu creation (useful for web application).
14. Write a PHP program to create an PHP Ajax application.

COURSE OUTCOME

Students are able to

1. Implement the basic concepts of PHP
2. Design programs using user defined functions
3. Apply file handling methods
4. Use Image functions to draw images
5. Create simple web page

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PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

B.Sc., COMPUTER SCIENCE

Semester: VI-MBE-II: Cloud Computing

Ins. Hrs. /Week:5

Course Credit:4

Course Code:R23MBECS2:1

OBJECTIVES:

- To understand the basic concepts of Cloud Computing
- To introduce the concepts of Cloud Architecture
- To provide knowledge about advance Cloud Computing Security Services

UNIT- I: Cloud Computing Foundation

(15 Hours)

Introduction to Cloud Computing :Cloud Computing Basics –History of cloud computing-Importance of Cloud Computing in the Current Era-Characteristics of Cloud Computing .Move to Cloud: Pros and Cons of Cloud Computing – Migrating into cloud. Types of Cloud: Public and Private Cloud -Cloud Infrastructure. Working of Cloud Computing: Trends in Computing-Cloud services model – Cloud Deployment Models.

UNIT–II:Cloud Computing Architecture

(15 Hours)

Cloud Computing Technology: Cloud Life Cycle Model- Reference Model for Cloud Computing.

Cloud Architecture: Cloud Computing Logical Architecture- Cloud System Architecture. **Cloud Modeling and Design:** Cloud Basic Principles- Model for Federated Cloud computing-Cloud Eco System Model-Cloud Governance.

UNIT-III:Virtualization

(15 Hours)

Foundations : Introduction to Virtualization-Types of Virtualization-Virtual Clustering. Grid, Cloud and Virtualization: Virtualization in grid –Virtualization in cloud –Virtualization and cloud security. Virtualization and Cloud Computing: Anatomy of Cloud Infrastructure-Virtual Infrastructures – CPU Virtualization .

UNIT- IV: Data Storage and Cloud Computing

(15 Hours)

Data Storage: Introduction to Enterprise Data Storage-Data Storage Management-File Systems Cloud Data Stores. **Cloud Storage:** Overview of Cloud Storage-Data Management for Cloud Storage. **Risks in Cloud Computing:** Risk Management-Cloud Impact-Enterprise Wide Risks in Management-Types of Risks in Cloud Computing.

UNIT V: Tools and Applications

(15 Hours)

Cloud Computing Tools : Moving Applications to the Cloud – Cloud Opportunities -Cloud Mashaps – Apache Hadoop – Cloud Tools. **Cloud Applications:** Microsoft Cloud Services. **Google Cloud Applications :** Google Applications Utilizing Cloud-Google App Engine. **Amazon Cloud Services :**

Understanding Amazon Web Components and Services-Elastic Compute Cloud. **Case Study:** Cloud Software for Private Banking- Cloud Software for Asset Management –Cloud Software for Fund Management.

Total Lecture Hours-75

COURSE OUTCOME

Upon successful completion of this course, students will be able to

1. Understand Cloud Computing and different Cloud service and deployment models
2. Describe importance of virtualization along with their technologies
3. Use and Examine different cloud computing services
4. Understand the cloud computing security
5. Understand the cloud applications and concepts of Amazon cloud services

TEXT BOOK

1. Srinivasan.A and Suresh.J 2014, Cloud Computing – A Practical Approach for Learning and Implementation, Pearson Publication, India .

REFERENCE BOOKS

1. Barrie Sonsinsky 2011, “Cloud Computing Bible”, 1st Edition, Wiley India Pvt.Ltd., New Delhi. Kannammal.A 2015, ” Fundamentals of Cloud Computing”, 1st Edition .Cengage Learning Private Limited, India.
2. Mehul Mahrishi Kamal Kant Hiran, Ruchi Doshi, Dr.Fagbola Temitayo 2019. “Cloud Computing”, 1st Edition ,BPB Publications, New Delhi.
3. Rajkumar Buyya 2011, James Broberg, AndrzejGoscinsky, “Cloud Computing Principles and Paradigms”, Wiley Pvt. Ltd, India.

E- RESOURCES

1. <https://www.javatpoint.com/cloud-computing-architecture>
2. https://www.tutorialspoint.com/cloud_computing/index.htm

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PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE
B.Sc., COMPUTER SCIENCE

Semester: VI-MBE-II: Mobile Computing

Ins. Hrs. /Week:5

Course Credit:4

Course Code:R23MBECS2:2

OBJECTIVES

- To introduce the concepts of mobile computing and its architecture
- To understand Synchronization Process
- To understand Operating Systems in Mobile Computing

UNIT- I: Mobile Communication

(15 Hours)

Guided Transmission-Unguided Transmission (Wireless Transmission) –Modulation Methods and Standards for Voice-oriented Data Communication Standards - Modulation Methods and Standards for Data and Voice Communication-**Mobile Computing**: Novel Applications-Limitations of Mobile Computing - **Mobile Computing Architecture**: Programming Languages-Functions of Operating Systems-Functions of Middleware for Mobile Systems- Mobile Computing Architectural Layers- Protocols Layer- **Mobile Devices**: Hand Held Mobile Smartphones with Multimedia Functionalities Smartcards Smart Sensors - **Mobile System Networks**: Cellular Network WLAN Network and Mobile IP Ad-hoc Networks - **Data Dissemination**: Synchronization - **Mobility Management Security**: cryptography Algorithms Digital Signatures and Digital Certificate.

UNIT –II: Mobile Devices and Systems

(15 Hours)

Cellular Networks and Frequency Reuse – Mobile- Smartphones, Smart Mobiles, and Systems- Smartphone Features- Digital Music Players- Bluetooth and Wi-Fi- GPS- Gyroscope and Accelerometer- Digital Compass and Magnetometer Camera- 2D and 3D Graphics and HDMI-**Handheld Pocket Computers**: Handheld Devices- Windows CE Based Devices- Mac OS Based Devices- Symbian OS Based Devices - Linux Based Mobile Devices- e-Book Reader- **Smart Systems**: Smartcards -Smart Labels - RFID- Smart Tokens- Sensors -Actuators- Sensors and Actuators for Robotic Systems- Smart Appliances- Set-top Boxes- **Limitations of Mobile Devices**: Quality and Security of Service- Hardware Limitations- **Automotive Systems**: Speech Recognition System Messaging System GPS Based Navigation System Automobile Start and Malfunction Login Sensor and Actuator Programming Entertainment Systems Real- time Application Programming.

UNIT -III: GSM Services and System Architecture

(15 Hours)

Services- Subsystems of GSM Architecture- GSM Architecture - **Radio Interfaces of GSM**: Space Division Multiple Access -Time Division Multiple Access- Frequency Division Multiple Access- Format of a Data Burst Traffic and Control Data Channels- Control data channels- **Protocols of GSM**: Mobile Station-Base Transceiver Signalling Protocols- Base Transceiver Base Station Controller Signalling Protocols- Base Station Controller-Mobile Services Switching Centre Signalling Protocols- Localization- Call Handling Mobile-PSTN Calls- Mobile-Mobile Calls- PSTN-Mobile Calls- Message Exchanges between Mobile Station-Base Transceiver-**Handover**: Types of Handover-Handover in GSM- **Security**: Authentication - TMSI- Encryption- New Data Services- **General Packet Radio Service**: GPRS System Architecture- GPRS

Protocol Layers- High-speed Circuit Switched Data.

UNIT- IV: Data Synchronization in Mobile Computing Systems

(15 Hours)

Synchronization in Mobile Computing Systems – Usage Models for Synchronization in Mobile Application-Domain-dependent Specific Rules for Data Synchronization Personal Information Manager Synchronization and Conflict Resolution Strategies Synchronizer - **Synchronization Software for Mobile Devices:** HotSync-ActiveSync- IntelliSyn - **Synchronization Protocols:** Bluetooth-IrDA-WAP2.0 Architecture, Gateway, and Application Environment.

UNIT V- Mobile Agent

(15 Hours)

Mobile Agent Design- Aglets- Application Framework -**Application Server:** Sun Java System Web Server-IBM Web Sphere MQ- Oracle Application Server -Portals- **Gateways:** Protocol Conversion Gateway-Transcoding Gateway or Proxy- Residential Gateway- Service Discovery **Device Management:** Device Support Infrastructure- User, Device, and Network Profiles- Directory Service -Open Mobile Alliance Device Management(OMADM)- **Mobile File Systems:** CODA File System Disconnected Operations-CODA File System Deficiencies-Security.

Total Lecture Hours-75

COURSE OUTCOMES

Students are able to

1. Understand the principles and theories of mobile computing technologies
2. Describe about the mobile devices and system
3. Deal with GSM and Similar Architectures
4. Describe about the Data Synchronization in Mobile Computing System
5. Analyze about mobile operating systems

TEXT BOOKS

1. KumkumGarg 2010, Mobile Computing, Pearson Education,India.
2. Rajkamal 2011, Mobile Computing, Oxford University Press, United Kingdom.

REFERENCE BOOKS

1. Jonathan Stark, Brian Jepson 2012, —Building Android Apps with HTML, CSS, and JavaScriptll, 2 Edition, O'Reilly Media, USA.
2. Jochen Schiller, —Mobile Communicationsll, Second Edition, By Pearson, India.
3. Prasant Kumar Pattnaik and Rajib Mall 2012, —Fundamentals of Mobile Computingll, PHI Learning Private Limited, New Delhi

E-RESOURCES

1. https://www.tutorialspoint.com/mobile_computing/index.htm
2. <https://india.oup.com/orcs/9780199455416/>
3. <https://www.igi-global.com/book/mobile-computing-wireless-networks/127615>
4. https://www.tutorialspoint.com/mobile_computing/mobile_computing_useful_resources.htm
5. <https://www.intechopen.com/books/subject/communications-and-security-mobile-computing>



Bharathidasan University, Tiruchirappalli – 24

Gender Studies

23UGGS

Objectives

To make boys and girls aware of each others 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: 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 : UGC’s Guidelines – VII to XI Plans – Gender Studies : Beijing Conference and CEDAW – Exclusiveness and Inclusiveness.

Unit – III

Areas of Gender Discrimination : Family – Sex Ratio – Literacy – Health – Governance – Religion Work Vs Employment – Market – Media – Politics – Law – Domestic Violence – Sexual Harassment – State Policies and Planning .

Unit – IV

Women Development and Gender Empowerment : 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 : 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

References

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. Bhasin Kamala , What is Patriarchy? : Gender Basics, New Delhi :Women Unlimited ,1993
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