

CSSR & SRRM DEGREE & PG COLLEGE **(Autonomous)**

Kamalapuram - 516289, Kadapa, A.P.



Board of Studies
Minutes of the Meeting-I (Virtual)
Academic Year: 2025-2026

Department of Computer Science & Applications

Dated: 12/06/2025

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2. Course Structure
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Department of Computer Science & Applications

The Board of studies meeting – I for the academic year 2025-2026 for the Department of Computer Science & Applications was held through Virtual Mode on 12/06/2025 at 3:00 p.m. in the Department of computer science & Application

Agenda & Minutes of Meeting

Agenda:

1. To approve the syllabus of the III and IV semesters for II B.Sc. Honours (Computer Science) & II B.Com. Honours (Computer Applications) & Skill Course for all the UG Courses in IIIrd semester.
2. To approve course outcomes & model question paper for following courses:

Semester III: B.Sc. (Computer Science)

- Object Oriented Programming using Java.
- Data Structures using C.
- Computer Organization
- Operating Systems

Semester III: B.Com. (Computer Application)

- E Commerce & Web designing
- Digital Marketing

Semester III: BA/BSC/BCom/BBA

- Information and Communication Technology (Skill Course)

Semester IV: B.Sc. (Computer Science)

- Database Management System
- Object Oriented Software Engineering
- Data Communications and Computer Networks

Semester IV: B.Com. (Computer Application)

- DBMS with Oracle

3. To approve blue print and model Question Paper for Information and Communication (Skill Course)
4. To approve the list of Question paper Setters & Examiners
5. To discuss about departmental & research activities
6. Any other matter with the permission of Chair.

RESOLUTIONS

In BoS meeting, all the panel members have discussed and unanimously approved the following agendas:

1. The Members of BoS Unanimously discussed and made some modifications in the syllabus of

Semester III: B.Sc. (Computer Science)

- Object Oriented Programming using Java.
- Data Structures using C.
- Computer Organization

Semester III: BA/BSC/BCom/BBA

- Information and Communication Technology (Skill Course)

Semester IV: B.Sc. (Computer Science)

- Database Management System

Semester IV: B.Com. (Computer Application)

- DBMS with Oracle

2. The Members approved the course structure & Model Question Paper for the subjects/papers.
3. The Members approved the modified blue print and model Question Paper for Information and Communication Technology (Skill Course)
4. The members approved the list question paper setters and examiners.
5. The members of BoS decide to organise departmental activities and to enhance the research activities.
6. The members of BoS Suggested to give additional value added add-on Courses for Students

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The approved modified syllabus by the BoS panel members is:


Sl. No.	Group , Semester & Title of the Paper	Existing Topic	Modified Topic	Remarks
1	B.Sc. Computer Science-Semester - III, Major Paper- Object Oriented Programming using Java	Reading Input with Java.util.Scanner Class, Displaying Output with System.out.printf(), Displaying Formatted Output with String.format()	Unit-1: Input and Output Statements in java	Input and output operations enable Java programs to interact with users, making it possible to create user-friendly applications with graphical interfaces or command-line interfaces .
		Control Statements	Unit-II Control Statements - Selection Statements, Iteration Statements, Jumping Statements.	The control statements help users specify the order of execution of the instructions present in a program.
		Event Handling- The Delegation event model- Events, Event sources, Event Listeners, Event classes, Handling mouse and keyboard events, Adapter classes, Inner classes, Anonymous Inner classes. (Removed)	-----	The topic was removed to modernize the syllabus, shifting focus from older Swing event handling to contemporary frameworks and event-driven architectures.
2	B.Sc. Computer Science-Semester - III, Major Paper- Data Structures using C	-----	Unit- IV-Heap Sort (Added)	Students will learn Heap sort is an important sorting algorithm due to its guaranteed efficiency and in-place sorting capability, making it suitable for large datasets and memory-constrained environments.
3	B.Sc. Computer Science-Semester - III, Major Paper- Computer Organization	-----	Unit-III-Intel 8086 Microprocessor Architecture – Assembly Programming Language (Added)	Students will get knowledge on inner workings of computers and can significantly enhance a programmer's understanding of how software interacts with hardware
4	BA/BSC/B.Com/BBA- III Semester- (Skill Course) Information and Communication Technology	Cryptography, Digital signatures	Unit-III: Phishing, Botnets	Students will learn about Advanced Malware Attacks in daily life.

5	B.Sc. Computer Science-Semester - IV, Major Paper- Database Management System	-----	Unit-I:DBMS Architecture, DBMS vendors and their products.(Added)	Learning DBMS architecture is crucial for students because it provides a fundamental understanding of how data is organized, accessed, and managed within computer systems.
			Unit-V: Operators, Unstructured database: Introduction and its types.	Students should learn about unstructured databases because they are increasingly important in today's data-driven world, where a large proportion of data is unstructured. Understanding how to manage and analyze this type of data is crucial for a wide range of applications and industries.
6	B.Com Computer Applications-Semester -IV, Major Paper- DBMS with Oracle	----- Serializability, Recoverability, Implementation of Isolation, Testing for Serializability, Failure Classification, Storage, Recovery and Atomicity, Recovery algorithm.	Unit-I :DBMS Architecture, DBMS vendors and their products.(Added)	Learning DBMS architecture is crucial for students because it provides a fundamental understanding of how data is organized, accessed, and managed within computer systems.
			Unit-V: Unstructured database: Introduction and its types	Students should learn about unstructured databases because they are increasingly important in today's data-driven world, where a large proportion of data is unstructured. Understanding how to manage and analyze this type of data is crucial for a wide range of applications and industries.


 Approved
 Pst
 G. Rajesh.

COURSE STRUCTURE

Year	Semester & Group	Course Code	Title of Paper	No. Hours/week	Credits	CIA	SEE	Total
II	III B.Sc. Honours (Computer Science)	CS301	Object Oriented Programming using Java- (T)	3	3	30	70	100
			Object Oriented Programming using Java - (P)	2	1	-	50	50
		CS302	Data Structures using C - (T)	3	3	30	70	100
			Data Structures using C - (P)	2	1	-	50	50
		CS303	Computer Organization - (T)	3	3	30	70	100
			Computer Organization- (P)	2	1	-	50	50
		CS304	Operating Systems - (T)	3	3	30	70	100
			Operating Systems - (P)	2	1	-	50	50
II	III B.Com Honours (Computer Applications)	COM303	E Commerce & Web designing-(T)	3	3	30	70	100
			E Commerce & Web designing-(P)	2	1	-	50	50
		COM304	Digital Marketing-(T)	3	3	30	70	100
			Digital Marketing -(P)	2	1	-	50	50
II	III B.A/ B.Com /BBA/B.SC	SC301	Information and Communication Technology	2	2	-	50	50
II	IV B.Sc. Honours (Computer Science)	CS401	Database Management System - (T)	3	3	30	70	100
			Database Management System - (P)	2	1	-	50	50
		CS402	Object Oriented Software Engineering - (T)	3	3	30	70	100
			Object Oriented Software Engineering - (P)	2	1	-	50	50
		CS403	Data Communications and Computer Networks- (T)	3	3	30	70	100
			Data Communications and Computer Networks- (P)	2	1	-	50	50
II	IV B.Com Honours (Computer Applications)	COM403	DBMS with Oracle-(T)	3	3	30	70	100
			DBMS with Oracle-(P)	2	1	-	50	50


 Approved
 P.S.
 G. Raju.



CSSR & SRRM DEGREE & PG COLLEGE
Autonomous
Re- accredited with NAAC 'A' Grade (Cycle-II)
(Permanently Affiliated to Yogi Vemana University, Kadapa)

II B.Sc. Honours (Computer Science)

Semester-III

Title of the Paper: Object Oriented Programming using Java

Syllabus

Course Objectives

To introduce the fundamental concepts of Object-Oriented programming and to design & implement object-oriented programming concepts in Java.

Course Outcomes

Upon successful completion of the course, a student will be able to:

CO1: Understand the basic concepts of Object-Oriented Programming and Java Program Constructs

CO2: Implement classes and objects and analyze Inheritance and Dynamic Method Dispatch

CO3: Demonstrate various classes in different packages and can design own packages

CO4: Manage Exceptions and Apply Threads

CO5: Create GUI screens along with event handling

UNIT-I

OOPs Concepts and Java Programming: Introduction to Object-Oriented concepts, procedural and object-oriented programming paradigm.

Java programming: An Overview of Java, Java Environment, Data types, Variables, constants, scope and life time of variables, operators, type conversion and casting, Accepting Input from the Keyboard, Input and output statements in java.

UNIT-II

Control Statements: selection statement, iteration statements, jumping statements.

Arrays, Command Line Arguments, Strings-String Class Methods.

Classes & Objects: Creating Classes, declaring objects, Methods, parameter passing, static fields and methods, Constructors, and 'this' keyword, overloading methods and access

Polymorphism: Dynamic binding, method overriding, abstract classes and methods

UNIT-III

Inheritance: Inheritance hierarchies, super and subclasses, member access rules, 'super' keyword, preventing inheritance: final classes and methods, the object class and its methods.

Interface: Interfaces VS Abstract classes, defining an interface, implement interfaces, accessing implementations through interface references, extending interface.

UNIT-IV

Packages: Defining, creating and accessing a package, understanding CLASSPATH, importing packages.

Exception Handling: Benefits of exception handling, the classification of exceptions, exception hierarchy, checked exceptions and unchecked exceptions, usage of try, catch, throw, throws and finally, rethrowing exceptions, exception specification, built in exceptions, creating own exceptionsub classes.

UNIT-V

Multithreading: Differences between multiple processes and multiple threads, thread states, thread life cycle, creating threads, interrupting threads, thread priorities, synchronizing threads, inter thread communication.

GUI Programming with Swing- Introduction, MVC architecture, components, containers. Understanding Layout Managers - Flow Layout, Border Layout, Grid Layout, Card Layout, Grid Bag Layout.

Text Books:

1. Java The complete reference, 9th edition, Herbert Schildt, McGraw Hill.
2. Understanding Object-Oriented Programming with Java, updated edition,T. Budd, Pearson Education.

Reference Books:

1. Cay S. Horstmann, “Core Java Fundamentals”, Volume 1, 11 th Edition, Prentice Hall, 2018.
2. Paul Deitel, Harvey Deitel, “Java SE 8 for programmers”, 3rd Edition, Pearson, 2015.
3. S. Malhotra, S. Chudhary, Programming in Java, 2nd edition, Oxford Univ. Press.

SUGGESTED CO-CURRICULAR ACTIVITIES & EVALUATION METHODS:

Unit 1: Activity: Quiz on Object-Oriented Programming Concepts and Java Constructs

Evaluation Method: Quiz Performance and Knowledge Retention

Unit 2: Activity: Object-Oriented Programming Assignment: Class Implementation

Evaluation Method: Assignment Completion and Correctness

Unit 3: Activity: Hands-on Lab Activity: Creating and Using Custom Java Packages


Evaluation Method: Lab Performance and Correctness of Code Implementation

Unit 4: Activity: Case Study Discussion on where multi-threading is crucial

Evaluation Method: Critical thinking, problem-solving, and presentation skills.

Unit 5: Activity: GUI design contest using Java Swings

Evaluation Method: GUI design, Visual appearance and user friendliness, usability, and adherence to event handling principle


Aruna
P.T.
G. Rajesh.

II B.Sc. Honours (Computer Science)


Semester-III

Object Oriented Programming using Java (Practical)

Syllabus

List of Experiments

1. Write a Java program to print Fibonacci series using for loop.
2. Write a Java program to calculate multiplication of 2 matrices.
3. Create a class Rectangle. The class has attributes length and width. It should have methods that calculate the perimeter and area of the rectangle. It should have read Attributes method to read length and width from user.
4. Write a Java program that implements method overloading.
5. Write a Java program for sorting a given list of names in ascending order.
6. Write a Java program that displays the number of characters, lines and words in a text file.
7. Write a Java program to implement various types of inheritance
 - i. Single
 - ii. Multi-Level
 - iii. Hierarchical
 - iv. Hybrid
8. Write a java program to implement runtime polymorphism.
9. Write a Java program which accepts withdraw amount from the user and throws an exception “In Sufficient Funds” when withdraw amount more than available amount.
10. Write a Java program to create three threads and that displays “good morning”, for every one second, “hello” for every 2 seconds and “welcome” for every 3 seconds by using extending Thread class.
11. Write a Java program that creates three threads. First thread displays “OOPS”, the second thread displays “Through” and the third thread Displays “JAVA” by using Runnable interface.
12. Implement a Java program for handling mouse events when the mouse entered, exited, clicked, pressed, released, dragged and moved in the client area.
13. Implement a Java program for handling key events when the key board is pressed, released, typed.
14. Write a Java swing program that reads two numbers from two separate text fields and display sum of two numbers in third text field when button “add” is pressed.
15. Write a Java program to design student registration form using Swing Controls. The form which having the following fields and button SAVE
Form Fields are: Name, RNO, Mailid, Gender, Branch, Address.


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II B.Sc. Honours (Computer Science)

Semester-III

Title of the Paper: Data Structures using C

Syllabus

Course Objectives

To introduce the fundamental concept of data structures and to emphasize the importance of various data structures in developing and implementing efficient algorithms.

Course Outcomes

Upon successful completion of the course, a student will be able to:

CO1: Understand various Data Structures for data storage and processing.

CO2: Realize Linked List Data Structure for various operations

CO3: Analyze step by step and develop algorithms to solve real world problems by implementing Stacks, Queues data structures.

CO4: Understand and implement various searching & sorting techniques.

CO5: Understand the Non-Linear Data Structures such as Binary Trees and Graphs

UNIT-I

Basic Concepts: Pointers and dynamic memory allocation, Algorithm-Definition and characteristics, Algorithm Analysis-Space Complexity, Time Complexity, Asymptotic Notation **Introduction to Data structures:** Definition, Types of Data structure, Abstract Data Types (ADT), Difference between Abstract Data Types, Data Types, and Data Structures.

Arrays-Concept of Arrays, Single dimensional array, Two dimensional array, Operations on arrays with Algorithms (searching, traversing, inserting, deleting).

UNIT-II

Linked List: Concept of Linked Lists, Representation of linked lists in Memory, Comparison between Linked List and Array, Types of Linked Lists - Singly Linked list, Doubly Linked list, Circularly Singly Linked list, Circularly Doubly Linked list;

Implementation of Linked List ADT: Creating a List, Traversing a linked list, Searching linkedlist, Insertion and deletion into linked list (At first Node, Specified Position, Last node), Application of linked lists.

UNIT-III

Stacks: Introduction to stack ADT, Representation of stacks with array and Linked List, Implementation of stacks, Application of stacks - Polish Notations - Converting Infix to Post Fix Notation - Evaluation of Post Fix Notation - Tower of Hanoi, Recursion: Concept and Comparison between recursion and Iteration.

Queues: Introduction to Queue ADT, Representation of Queues with array and Linked List, Implementation of Queues, Application of Queues Types of Queues- Circular Queues, De-queues, Priority Queue

UNIT-IV

Searching: Linear or Sequential Search, Binary Search and Indexed Sequential Search.

Sorting: Selection Sort, Bubble Sort, Insertion Sort, Quick Sort and Merge Sort, Heap Sort.

UNIT-V

Binary Trees: Concept of Non- Linear Data Structures, Introduction Binary Trees, Types of Trees, Basic Definition of Binary Trees, Properties of Binary Trees, Representation of Binary Trees, Operations on a Binary Search Tree, Binary Tree Traversal, Applications of Binary Tree.

Graphs: Introduction to Graphs, Terms Associated with Graphs, Sequential Representation of Graphs, Linked Representation of Graphs, Traversal of Graphs (DFS, BFS), Application of Graphs.

Text Books:

1. Horowitz and Sahani, "Fundamentals of Data Structures", Galgotia Publications Pvt Ltd Delhi India.
2. A.K. Sharma, "Data Structure Using C", Pearson Education India. "Data Structures Using C" Balagurusamy E. TMH

Reference Books:

1. "Data Structures through C", Yashavant Kanetkar, BPB Publications
2. Rajesh K. Shukla, "Data Structure Using C and C++" Wiley Dreamtech Publication.
3. Lipschutz, "Data Structures" Schaum's Outline Series, Tata Mc graw-hill Education (India) Pvt. Ltd .
4. Michael T. Goodrich, Roberto Tamassia, David M. Mount "Data Structures and Algorithms in C++", Wiley India.

SUGGESTED CO-CURRICULAR ACTIVITIES & EVALUATION METHODS:

Unit 1: Activity: Algorithm analysis exercises

Evaluation Method: Programming Assignment and Correctness

Unit 2: Activity: Presentations on real-life applications of linked lists

Evaluation Method: Presentation skills or reports

Unit 3: Activity: Role-playing activities for stack operations


Evaluation Method: Problem-solving skills, communication and collaboration abilities.

Unit 4: Activity: Sorting algorithm analysis and comparison activities

Evaluation Method: Performance analysis and presentation.

Unit 5: Activity: Case Study on Applications of Graphs

Evaluation Method: Critical thinking, problem-solving, and presentation skills


Aruna
P.T.
G. D. Singh.

II B.Sc. Honours (Computer Science)


Semester-III

Data Structures using C (Practical)

Syllabus

List of Experiments

1. Write a program to read 'N' numbers of elements into an array and also perform the following operation on an array
 - a. Add an element at the beginning of an array
 - b. Insert an element at given index of array
 - c. Update an element using a values and index
 - d. Delete an existing element
2. Write Program to implement Single Linked List with insertion, deletion and traversal operations
3. Write Program to implement Circular doubly Linked List with insertion, deletion and traversal operations
4. Write Programs to implement the Stack operations using an array
5. Write a program using stacks to convert a given infix expression to postfix
6. Write Programs to implement the Stack operations using Liked List.
7. Write Programs to implement the Queue operations using an array.
8. Write Programs to implement the Queue operations using Liked List.
9. Write a program for Binary Search Tree Traversals
10. Write a program to search an item in a given list using the following Searching Algorithms
 - a. Linear Search
 - b. Binary Search.
11. Write a program for implementation of the following Sorting Algorithms
 - a. Bubble Sort
 - b. Insertion Sort
 - c. Quick Sort


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II B.Sc. Honours (Computer Science)

Semester-III

Title of the Paper: Computer Organization Syllabus

Course Objectives

To familiarize with organizational aspects of memory, processor and I/O.

Course Outcomes

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

CO1: Identify different types of instructions.

CO2: Differentiate between micro-programmed and hard-wired control units.

CO3: Analyse the performance of hierarchical organization of memory.

CO4: Summarize different data transfer techniques.

CO5: Demonstrate arithmetic operations on fixed- and floating-point numbers and illustrate concepts of parallel processing.

UNIT – I

Register Transfer Language and Micro Operations: Introduction- Functional units, computer registers, register transfer language, register transfer, bus and memory transfers, arithmetic, logic and shift micro-operations, arithmetic logic shift unit.

Basic Computer Organization and Design: Instruction codes, instruction cycle.

Register reference instructions, Memory – reference instructions, input – output and interrupt.

UNIT – II

CPU and Micro Programmed Control: Central Processing unit: Introduction, instruction formats, addressing modes. Control memory, address sequencing, design of control unit - hard wired control, micro programmed control.

UNIT – III

Computer Arithmetic: Data representation- fixed point, floating point, addition and subtraction, multiplication and division algorithms. Intel 8086 Microprocessor Architecture – Assembly Programming Language .

Parallel Processing- Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline.

UNIT – IV

Memory Organization: Memory hierarchy, main memory, auxiliary memory, associative memory, cache Memory and mappings.

UNIT – V

Input-Output Organization: Peripheral Devices, input-output interface, asynchronous data transfer, modes of transfer- programmed I/O, priority interrupt, direct memory access, Input – Output Processor (IOP).

Text Books:

1.M. Moris Mano, “Computer Systems Architecture”, 3rd edition, Pearson/ PHI.

Reference Books:

1.Carl Hamacher, ZvonksVranesic, SafeaZaky, “Computer Organization”, 5th edition,McGraw Hill.

2.William Stallings, “Computer Organization and Architecture”, 8th edition, Pearson/PHI.

SUGGESTED CO-CURRICULAR ACTIVITIES & EVALUATION METHODS:

Unit 1: Activity: Quiz competition on micro-operations.

Evaluation Method: Accuracy and speed in answering quiz questions.

Unit 2: Activity: Instruction Format Puzzle: Solving a puzzle to decode and understand instruction formats.

Evaluation Method: Accuracy and speed in completing the puzzle.

Unit 3: Activity: Memory Hierarchy Poster: Creating informative posters or infographics on memory hierarchy.

Evaluation Method: Clarity of information, presentation and creativity of visual design.

Unit 4: Activity: I/O Troubleshooting Challenge

Evaluation Method: problem identification, feasibility of proposed solutions, and clarity of explanations.

Unit 5: Activity: Case Study on Parallel processing architecture.

Evaluation Method: Understanding of parallel processing concepts and architectures.

*By
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P
G. Vijay.*

II B.Sc. Honours (Computer Science)


Semester-III

Computer Organization (Practical)

Syllabus

List of Experiments

1. Implement a C program to convert a Hexadecimal, octal, and binary number to decimal number vice versa.
2. Implement a C program to perform Binary Addition & Subtraction.
3. Implement a C program to perform Multiplication of two binary numbers.
4. Implement arithmetic micro-operations using logic gates.
5. Implement logic and shift micro-operations using logic gates.
6. Implement a C program to perform Multiplication of two binary numbers (signed) using Booth's Algorithms.
7. Implement a C program to perform division of two binary numbers (Unsigned) using restoring division algorithm.
8. Implement a C program to perform division of two binary numbers (Unsigned) using non-restoring division algorithm.
9. Write assembly language code for $A+B*(C-D)$ using various instruction formats in MASM or any open-source assembler.
10. Write assembly language code for $A+B*C$ using various addressing modes in MASM or any open-source assembler.


Arun
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II B.Sc. Honours (Computer Science)

Semester-III

Title of the Paper: Operating Systems

Syllabus

Course Objectives

To gain knowledge about various functions of an operating system like memory management, process management, device management, etc.

Course Outcomes

Upon successful completion of the course, a student will be able to:

CO1: Demonstrate knowledge and comprehension of operating system functions.

CO2: Analyze different process scheduling algorithms and apply them to manage processes and threads effectively.

CO3: Create strategies to prevent, detect, and recover from deadlocks, and design solutions for inter-process communication and synchronization problems.

CO4: Compare and contrast different memory allocation strategies and evaluate their effectiveness.

CO5: Evaluate disk scheduling algorithms while implementing OS security measures.

UNIT- I

What is Operating System? History and Evolution of OS, Basic OS functions, Resource Abstraction, Types of Operating Systems– Multiprogramming Systems, Batch Systems, Time Sharing Systems; Operating Systems for Personal Computers, Workstations and Hand-held Devices, Process Control & Real time Systems.

UNIT- II

Processor and User Modes, Kernels, System Calls and System Programs, System View of the Process and Resources, Process Abstraction, Process Hierarchy, Threads, Threading Issues, Thread Libraries; Process Scheduling- Non-Preemptive and Preemptive Scheduling Algorithms.

UNIT III

Process Management: Deadlock, Deadlock Characterization, Necessary and Sufficient Conditions for Deadlock, Deadlock Handling Approaches: Deadlock Prevention, Deadlock Avoidance and Deadlock Detection and Recovery.

Concurrent and Dependent Processes, Critical Section, Semaphores, Methods for Inter process Communication; Process Synchronization, Classical Process Synchronization Problems: Producer-Consumer, Reader-Writer.

UNIT IV

Memory Management: Physical and Virtual Address Space; Memory Allocation Strategies–Fixed and -Variable Partitions, Paging, Segmentation, Virtual Memory.

UNIT V

File and I/O Management: Directory Structure, File Operations, File Allocation Methods, Device Management, Pipes, Buffer, Shared Memory, Disk Scheduling algorithms.

Text Books:

1. Operating System Principles by Abraham Silberschatz, Peter Baer Galvin and Greg Gagne (7th Edition) Wiley India Edition.

Reference Books:

1. Operating Systems: Internals and Design Principles by Stallings (Pearson)
2. Operating Systems by J. Archer Harris (Author), Jyoti Singh (Author) (TMH)

SUGGESTED CO-CURRICULAR ACTIVITIES & EVALUATION METHODS:

Unit 1: Activity: Case Study on a specific Operating System: highlighting its functions and key features.

Evaluation Method: Case study presentation, depth of understanding of operating system functions, and ability to articulate key concepts.

Unit 2: Activity: Comparison Poster on Scheduling Algorithms

Evaluation Method: Assessment of posters based on content accuracy, clarity of information, visual presentation, and ability to convey key insights.

Unit 3: Activity: Assignment on Dead Lock prevention techniques

Evaluation Method: Understanding, Completion and report.

Unit 4: Activity: Debate on various Memory allocation schemes

Evaluation Method: Debate arguments, ability to counter opposing viewpoints, logical reasoning, and presentation skills.

Unit 5: Activity: Comparative study of various disk scheduling algorithms using real world datasets

Evaluation Method: Analysis methodology, accuracy of results, and presentation of findings and conclusions.

*Prof.
Aravind
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G. Vijay.*

II B.Sc. Honours (Computer Science)

Semester-III

Operating Systems (Practical)

Syllabus

1. Illustrate the LINUX commands
 - a) pwd
 - b) mkdir
 - c) rmdir
 - d) grep
 - e) chmod
 - f) ls
 - g) rm
 - h) cp

2. Write a program to calculate average waiting time and turn around time of each process using the following CPU Scheduling algorithm for the given process schedules.
 - a) FCFS
 - b) SJF
 - c) Priority
 - d) Round Robin

3. Simulate MVT and MFT memory management techniques

4. Write a program for Bankers Algorithm for Dead Lock Avoidance

5. Implement Bankers Algorithm Dead Lock Prevention.

6. Write a program to simulate Producer-Consumer problem.
7. Simulate all Page replacement algorithms.
 - e) FIFO
 - f) LRU
 - g) LFU
 - h) Optimal
8. Simulate Paging Techniques of memory management
9. Simulate the following disk scheduling algorithms
 - a) FCFS
 - b) SSTF
 - c) SCAN
 - d) CSCAN

Prof
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G. Rajesh.

II B.Com. Honours (Computer Applications)

Semester-III

Title of the Paper: E COMMERCE AND WEB DESIGNING

Syllabus

Course Objectives

- 1.The course aims to help learners to acquire conceptual knowledge of fundamental concept of E- commerce & Web Designing.
- 2.Emphasize the importance of various E-commerce & Web Designing. Developing and implementing efficient algorithms.

Learning Outcomes

The student will be able to:

- CO1: Explain how to create an **e-commerce website** from scratch, using PHP and the Bootstrap framework.
- CO2: Display featured products correctly on a **web** page, using the bootstrap system.
- CO3: Explain how product detail models are programmed to be dynamic.

Unit 1: Basics And Definitions: Definition, E-Commerce with 5-C Model, Additional Terms, Business Models Related To E-Commerce, Advantages And Disadvantages, Web 2.0, Technical And Economic Challenges.

Frameworks and Architectures: Actors And Stakeholders, Fundamental Sales Process And His 7+1 Process Steps Work, Technological Elements, Typical Applications.

Case Study: Identify different E-Commerce websites and write their functionality.

Unit 2: B2C Business: B2c Basics, B2c-Business AndCrm, B2c Software Systems, Customer Relationship Management (Crm).

B2B Business: B2b Basics, Differences Between B2b And B2c, B2b Software Systems, Supply Chain Management.

Case Study: Identify B2B and B2C websites in Unit-I Case Study and differentiate their functionality.

Unit 3: Security & Compliance Management: Foundations Of Risk Management, Compliance Management, Information Security Management (Ism), Technology

Electronic Payment: Business and Money, the Payment Challenge, Payment Procedures, Receivables Management, Cyber Money.

Case Study: Identify different payment methods used in purchase.ng of goods in Amazon, Flipkart etc.. and write their Pros and Cons of each payment method.

Unit 4: Introduction to Web Programming: Introduction, creating a website, HTML tags, HTML Elements, HTML attributes, CSS Preview, History of HTML, Differences between old HTML and HTML5, how to check your HTML code.

Coding Standards, Block Elements:

HTML coding conventions, Comments, HTML Elements, Should Describe Web Page Content Accurately, Content Model Categories, Block Elements, block quote Element, Whitespace Collapsing, pre Element, Phrasing Elements, Editing Elements, q and cite Elements, dfn, abbr, and time Elements, Code-Related Elements, br and wbr Elements.

Text Elements, and Character References: sup, sub, s, mark, and small Elements, strong, em, b, u, and i Elements, span Element, Character References, Web Page with Character References, and Phrasing Elements.


Case Study: Create a web page of your department using standard HTML tags, HTML elements and HTML attributes

Unit 5: Cascading Style Sheet (CSS): CSS Overview, CSS Rules, Example with Type Selectors and the Universal Selector, CSS Syntax and Style, Class Selectors, ID Selectors, span and div Elements, Cascading, style Attribute, style Container, External CSS Files, CSS Properties, Color Properties, RGB Values for Color, Opacity Values for Color, HSL and HSLA Values for Color, Font Properties, line-height Property, Text Properties, Border Properties, Element Box, padding Property, margin Property,

Case Study: Description of your City or place with the use of CSS and compare it with previous two case studies

Reference Books:

1. Introduction to E-Commerce:Combining Business And Information Technology By Martin Kutz
2. Lallana, Quimbo, Andam, 4. Cf. Ravi Kalakota and Andrew B. Whinston, Electronic Commerce:A Manager's Guide (USA: Addison Wesley Longman, Inc., 1997), 19-20.
3. Web Programming with HTML5,CSS and JavaScript, John Dean, Jones & Bartlett Learning
4. HTML & CSS: The Complete Reference, 5th Edition, Thomas. A. Powell


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II B.Com. Honours (Computer Applications)

Semester-III

E COMMERCE AND WEB DESIGNING (Practical)

Syllabus

Note: All the questions should be practiced using **Blue Griffon, Google Web Designer, KompoZer and open Element /any related tools**. The students should be taught the usage of appropriate html tags for these questions

In the practical examination the students have to write the procedure for performing the given task in front page followed by the html tags used to perform the task.

LIST OF EXPERIMENTS

1. Create a web page to display a hyperlink which when clicked directs you to Amazon website.
2. Create a web page to demonstrate your college name aligned with the logo of your college.
3. Create a web page to demonstrate definition lists taking various applications of ecommerce as an example.
4. Create a web page which asks for mode of payment which includes the options: Credit card/Debit card/Online transfer (use radio buttons)
5. Create a web page which asks the user to enter his credit card details. Use textboxes, drop down buttons.
6. Create a web page to display definition list which defines the terms: B2B, B2C, C2B, C2C.
7. Create a web page which displays four buttons containing text B2B, B2C, C2B, C2C. Also when a button is clicked details about the clicked subject should appear on a separate page.
8. Create a web page to display the text “Digital Marketing” which scrolls randomly.
9. Create a web page to scroll the text “E-Commerce” for exactly 5 times from left to right of the screen.
10. Create a web page to insert an image which when clicked redirects you to your college website.
11. Create a web page to display the name of your college in h6 size with blue as font color and background color yellow separated by a thick line and below which a paragraph about the facilities offered by your college is described.
12. Create a web page to demonstrate a pull-down menu. The menu should contain the list of your favorite south Indian dishes.
13. Create a web page with name of your college as text. The text should scroll, alternate and slide.
14. Create a web page to display an image surrounded by text on all the four sides.
15. Create a web page to display 3 images which are aligned left, right and center respectively.
16. Create a web page with 4 paragraphs of about 5 lines each describing about E-Marketing, E-Shopping, E-banking and E-Learning. The paragraphs should be aligned left, right, center and justified respectively.
17. Create a web page with name of your college as Text in h6 size, font as verdana, blue as font color followed by a copyright symbol and trademark symbol.

18. Create a login page asking the user to enter his username and password followed by a submit button.
19. Create a web page using a form which collects data about student rollno, name and marks in various subjects followed by submit and reset buttons.
20. Create a web page using a form titled as Feedback form which takes the feedback of faculty teaching a particular subject in your college. The form should have fields student name, rollno followed by 5 check boxes labeled Excellent, Very Good, Good, Average, Bad respectively.
21. Create an unordered list of popular B2C ecommerce web sites.

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Semester-III

Title of the Paper: Digital Marketing

Syllabus

Course Objectives

1. The course aims to identify the impact of digital space and digital marketing in reaching out to customers.
2. Understand the importance of Search Engines and explain the working of Search Engines.
3. Able to Define email Marketing and have knowledge on how Social Media Marketing is to be used by marketers?

Learning Outcomes

The Students will be able to:

CO1: Use digital media for the creation of products and services and relate Search Engines in the digital marketing ecosystem.

CO2: Use Search Engine Marketing for advertisements and know the Social Media platforms like Facebook, Twitter, YouTube & LinkedIn for Marketing.

CO3: Outline email Marketing and strategy to craft email marketing campaign.

Unit 1: Digital Marketing: Introduction to Digital Marketing. Traditional Vs. Digital Marketing, Technology behind Digital Marketing, Characteristics of Digital Marketing, Digital Marketing Strategy, Understanding Digital Consumer.

Case Study: Analyze the change in ranking of your Web Promotion Page

Unit 2: Online Advertising: Introduction, Objective, Where to Advertise, Online AdFormat, Search Engine Ad, Network Advertising, Affiliate Programs, Landing Pages

Case Study: Create Google Add for your college

Unit 3: Email Marketing: Introduction, Types of Email, Email Marketing Campaign Process, Email marketing Tools, Advantages and Disadvantages, Opt-in Email Advertising, Email tracking

Case Study: Analyse the impact of your E-Mail Campaign

Unit 4: Social Media Marketing (SMM):

What is Social Media Marketing, Seven Myths of SMM, Characteristics of Successful Social Media Marketer, Social Media Marketing plan, Social Media marketing Tools, Publishing Blogs, Podcast and Webinars, Social Media Monitoring, Social Media: Face book, Twitter?

Case Study:

1. Analyze the performance of your Facebook and Instagram Page
2. Analyze the performance of your YouTube Video

Unit 5: Search Engine Optimization (SEO): Understanding SEO, Search Engine Optimization Process – Goals, On-Page Optimization, Off-Page Optimization and Analyze, Search Engine Result Process (SERP), SEO Tools.


Case Study: Analyse the impact of your Twitter Campaign

Text Books:

1. Digital Marketing by Seema Gupta, McGraw Hill Education
2. Fundamentals of Digital Marketing by Punit Singh Bhatia, Pearson

References:

1. Basics of Digital Marketing - Course (swayam2.ac.in)


- Anurag
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II B.Com. Honours (Computer Applications)


Semester-III

Digital Marketing (Practical)

Syllabus

LIST OF EXPERIMENTS

1. Digital Marketing Implementation in Business Scenario
2. Create the Digital Marketing Webpage
3. Conducting the Search Engine Optimization and Search Engine Marketing
4. Using Google Analytics to analyze website performance
5. Creating Promotional banner through Canva
6. Face book Promotion using banners
7. Creating YouTube Channel for Marketing
8. Twitter Marketing
9. Instagram Marketing
10. Email Marketing


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SKILL COURSE
II B.A/B.Com/BBA/B.Sc
Semester-III

Title of the Paper: Information and Communication Technology

Syllabus

Objectives:

This course aims at acquainting the students with basic ICT tools which help them in their day to day and life as well as in office and research.

Course outcomes: After completion of the course, student will be able to;

CO1: Understand the literature of social networks and their properties.

CO2: Explain which network is suitable for whom.

CO3: Develop skills to use various social networking sites like twitter, flickr, etc.

CO4: Learn few GOI digital initiatives in higher education.

CO5: Apply skills to use online forums, docs, spreadsheets, etc for communication, collaboration and research.

CO6: Get acquainted with internet threats and security mechanisms.

SYLLABUS:

UNIT-I: (08 hrs)

Fundamentals of Internet: What is Internet?, Internet applications, Internet Addressing –Entering a Web Site Address, URL–Components of URL, Searching the Internet, Browser –Types of Browsers, Introduction to Social Networking: Twitter, Tumblr, LinkedIn, Facebook, flickr, Skype, yahoo, YouTube, WhatsApp .

UNIT-II:(08 hrs)

E-mail: Definition of E-mail -Advantages and Disadvantages –User Ids, Passwords, Email Addresses, Domain Names, Mailers, Message Components, Message Composition, Mail Management.

G-Suite: Google drive, Google documents, Google spread sheets, Google Slides and Google forms.

UNIT-III:(10 hrs)

Overview of Internet security, E-mail threats and secure E-mail, Viruses and antivirus software, Firewalls, Phishing, Botnets, Copyright issues.

What are GOI digital initiatives in higher education? (SWAYAM, SwayamPrabha, National Academic Depository, National Digital Library of India, E-Sodh-Sindhu, Virtual labs, e- acharya, e-Yantra and NPTEL).

RECOMMENDED CO-CURRICULAR ACTIVITIES: (04 hrs)

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)
2. Student seminars (on topics of the syllabus and related aspects (individual activity))
 1. Quiz and Group Discussion
3. Slip Test
4. Try to solve MCQ's available online.
5. Suggested student hands on activities :
 - a. Create your accounts for the above social networking sites and explore them, establish a video conference using Skype.
 - b. Create an Email account for yourself- Send an email with two attachments to another friend. Group the email addresses use address folder.
 - c. Register for one online course through any of the online learning platforms like NPTEL, SWAYAM, Alison, Codecademy, Coursera. Create a registration form for your college campus placement through Google forms.

Reference Books:

1. In-line/On-line : Fundamentals of the Internet and the World Wide Web, 2/e – by Raymond Greenlaw and Ellen Hepp, Publishers : TMH
2. Internet technology and Web design, ISRD group, TMH.
3. Information Technology – The breaking wave, Dennis P.Curtin, Kim Foley, Kunai Sen and Cathleen Morin, TMH.

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Semester-IV

Title of the Paper: Database Management Systems

Syllabus

Learning Objectives:

To familiarize with concepts of database design

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

CO1: Differentiate between database systems and file based systems

CO2: Design a database using ER model

CO3: Use relational model in database design

CO4: Use SQL commands for creating and manipulating data stored in databases.

CO5: Write PL/SQL programs to work with databases.

UNIT- I

Overview of Database Management System: Introduction to data, information, database, database management systems, file-based system, Drawbacks of file-Based System, database approach, Classification of Database Management Systems, DBMS Architecture, advantages of database approach, Various Data Models, Components of Database Management System, three schema architecture of data base, costs and risks of database approach, DBMS vendors and their products.

UNIT - II

Entity-Relationship Model: Introduction, the building blocks of an entity relationship diagram, classification of entity sets, attribute classification, relationship degree, relationship classification, reducing ER diagram to tables, enhanced entity-relationship model (EER model), generalization and specialization, **IS A** relationship and attribute inheritance, multiple inheritance, constraints on specialization and generalization, advantages of ER modeling.

UNIT - III

Relational Model: Introduction, CODD Rules, relational data model, concept of key, relational integrity, relational algebra, relational algebra operations, advantages of relational algebra,

limitations of relational algebra, relational calculus, tuple relational calculus, domain relational Calculus (DRC), Functional dependencies and normal forms upto 3rd normal form.

UNIT - IV

Structured Query Language: Introduction, Commands in SQL, Data Types in SQL, Data Definition Language, Selection Operation, Projection Operation, Aggregate functions, Data Manipulation Language, Table Modification Commands, Join Operation, Set Operations, View, Sub Query.

UNIT - V

PL/SQL: Introduction, Shortcomings of SQL, Structure of PL/SQL, PL/SQL Language Elements, Data Types, operators, Operators Precedence, Control Structure, Steps to Create a PL/SQL, Program, Iterative Control, Procedure, Function, Database Triggers, Types of Triggers.
Unstructured Database : Introduction and its types.

Text Books:

1. Operating System Principles by Abraham Silberschatz, Peter Baer Galvin and GregGagne (7th Edition) Wiley India Edition.

Reference Books:

1. Database Management Systems by Raghu Ramakrishnan, McGrawhill
2. Principles of Database Systems by J. D. Ullman
3. Fundamentals of Database Systems by R. Elmasri and S. Navathe
4. SQL: The Ultimate Beginners Guide by Steve Tale.

SUGGESTED CO-CURRICULAR ACTIVITIES & EVALUATION METHODS:

Unit 1: Activity: Seminar Presentation on Database Management Systems

Evaluation Method: Depth of research, clarity of explanations, ability to address questions and engage the audience.

Unit 2: Activity: Case Study on EER model

Evaluation Method: Identification of inheritance relationships, effective use of generalization and specialization, and adherence to constraints.

Unit 3: Activity: Exercise on Normalization: Assign students a set of unnormalized tables and have them normalize the tables to third normal form

Evaluation Method: Normalized table designs, identification of functional dependencies, adherence to normalization rules, and elimination of anomalies.

Unit 4: Activity: Competition on SQL Query Writing

Evaluation Method: Query correctness, efficiency, proper use of SQL commands, ability to handle complex scenarios, and creativity in query formulation.

Unit 5: Activity: Peer Review of PL/SQL code

Evaluation Method: Peer evaluation of code quality, adherence to coding standards, proper use of language elements, and logic.

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G. Rajkumar.*

9. Retrieve all employees who were born during the 1950s
10. Retrieve all employees in department 5 whose salary is between 50,000 and 60,000 (inclusive)
11. Retrieve the names of all employees who do not have supervisors
12. Retrieve SSN and department name for all employees
13. Retrieve the name and address of all employees who work for the 'Research' department
14. For every project located in 'Stafford', list the project number, the controlling department number, and the department manager's last name, address, and birth date.
15. For each employee, retrieve the employee's name, and the name of his or her immediate supervisor.
16. Retrieve all combinations of Employee Name and Department Name
17. Make a list of all project numbers for projects that involve an employee whose last name is 'Narayan' either as a worker or as a manager of the department that controls the project.
18. Increase the salary of all employees working on the 'Product X' project by 15%. Retrieve employee name and increased salary of these employees.
19. Retrieve a list of employees and the project name each works in, ordered by the employee's department, and within each department ordered alphabetically by employee first name.
20. Select the names of employees whose salary does not match with salary of any employee in department 10.
21. Retrieve the employee numbers of all employees who work on project located in Bellaire, Houston, or Stafford.
22. Find the sum of the salaries of all employees, the maximum salary, the minimum salary, and the average salary. Display with proper headings.
23. Find the sum of the salaries and number of employees of all employees of the 'Marketing' department, as well as the maximum salary, the minimum salary, and the average salary in this department.
24. Select the names of employees whose salary is greater than the average salary of all employees in department 10.
25. Delete all dependents of employee whose ssn is '123456789'.
26. Perform a query using alter command to drop/add field and a constraint in Employee table.

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Semester-IV

Title of the Paper: Object Oriented Software Engineering Syllabus

Course Objective:

To introduce Object-oriented software engineering (OOSE) - which is a popular technical approach to analyzing, designing an application, system, or business by applying the object-oriented paradigm and visual modeling.

Course Outcomes:

Upon successful completion of the course, a student will be able to:

CO1: Understand and apply the fundamental principles of Object-Oriented Programming (OOP) concepts and Unified Modeling Language (UML) basics, in the development of software solutions.

CO2: Analyze and specify software requirements, develop use cases and scenarios, apply object-oriented analysis and design (OOAD) principles.

CO3: Familiar with the concept of test-driven development (TDD) and its practical implementation.

CO4: Analyze and Evaluate Software Maintenance and Evolution Strategies.

CO5: Apply Advanced Object-Oriented Software Engineering Concepts.

UNIT-I

Introduction to Object-Oriented Programming: Overview of software engineering, Introduction to Object-Oriented Programming (OOP) concepts (classes, objects, inheritance, polymorphism), Unified Modelling Language (UML) basics, Introduction to software development process and software development life cycle (SDLC).

UNIT-II

Requirements Analysis and Design: Requirements analysis and specification, Use cases and scenarios, Object-oriented analysis and design (OOAD), Design patterns, UML modelling techniques (class diagrams, sequence diagrams, state machine diagrams, activity diagrams)

UNIT-III

Software Construction and Testing: Software construction basics, Object-oriented design principles, , Software testing basics (unit testing, integration testing, system testing), Test-driven development (TDD)

UNIT-IV

Software Maintenance and Evolution: Software maintenance basics, refactoring techniques Software version control, Code review and inspection, Software evolution and reengineering

UNIT-V

Advanced Topics in Object-Oriented Software Engineering: Model-driven engineering (MDE), Aspect-oriented programming (AOP), Component-based software engineering (CBSE), Service-oriented architecture (SOA), Agile software development and Scrum methodologies.

Text Book(s)

1. An Introduction to Object-Oriented Analysis and Design and the Unified Process, 3rd Edition, Craig Larman, Prentice-Hall.
2. Programming in Java by Sachin Malhotra, Oxford University Press

Reference Books

1. Requirements engineering: processes and techniques, G.Kotonya and, I.Sommerville, 1998, Wiley
2. Design Patterns, E.Gamma, R. Helm, R. Johnson, and J. Vlissides
3. The Unified Modeling Language Reference Manual, J. Rumbaugh, I.Jacobson and G. Booch, Addison Wesley

SUGGESTED CO-CURRICULAR ACTIVITIES & EVALUATION METHODS:

Unit 1: Activity: Group Activity: Design and implement a small OOP project

Evaluation Method: Presentation evaluation rubric, Project evaluation based on OOP principles.

Unit 2: Activity: Use Case Scenario Presentation & Peer Activity: Review and provide feedback on each other's use case diagrams

Evaluation Method: Presentation evaluation rubric, Peer feedback assessment.

Unit 3: Activity: Poster Presentation: Illustrate TDD principles and benefits

Evaluation Method: Poster presentation evaluation

Unit 4: Activity: Peer Activity: Analyze and discuss different maintenance strategies

Evaluation Method: Peer discussion participation evaluation

Unit 5: Activity: Seminar on Design Patterns

Evaluation Method: Depth of research, clarity of explanations, ability to address questions and engage the audience.

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II B.Sc. Honours (Computer Science)

Semester-IV

Object Oriented Software Engineering (Practical) Syllabus

Suggested Software Tools: StarUML/UMLGraph/Topcased/Umberollo/ArgoUML/ Eclipse IDE, Visual Paradigm for UML/Rational Software Architect/Any other Open Source Tool

List of Experiments:

Select domain of interest (e.g. College Management System) and identify multi-tier software application to work on (e.g. Online Fee Collection). Analyze, design and develop this application using OOSE approach:

1. Develop an IEEE standard SRS document. Also develop risk management and project plan (Gantt chart).
2. Understanding of System modeling: Data model i.e. ER – Diagram and draw the ER Diagram with generalization, specialization and aggregation of specified problem statement
3. Understanding of System modeling: Functional modeling: DFD level 0 i.e. Context Diagram and draw it
4. Understanding of System modeling: Functional modeling: DFD level 1 and DFD level 2 and draw it.
5. Identify use cases and develop the use case model.
6. Identify the business activities and develop an UML Activity diagram.
7. Identity the conceptual classes and develop a domain model with UML Class diagram.
8. Using the identified scenarios find the interaction between objects and represent them using UML Interaction diagrams.
9. Draw the state chart diagram.
10. Identify the user interface, domain objects, and technical services. Draw the partial layered, logical architecture diagram with UML package diagram notation.
11. Implement the technical services layer.
12. Implement the domain objects layer.
13. Implement the user interface layer.
14. Draw component and deployment diagrams.

II B.Sc. Honours (Computer Science)

Semester-IV

Title of the Paper: Data Communication and Computer Networks Syllabus

Course Objectives

To provide students with a comprehensive understanding of networking principles, protocols, and technologies, enabling them to design, analyze, and evaluate efficient and reliable network solutions.

Course Outcomes

CO1: Upon successful completion of the course, a student will be able to:

CO2: Understand and apply network applications, hardware, software, and reference models for network communication.

CO3: Design and analyze data link layer protocols, multiple access protocols, and wireless LAN technologies.

CO4: Design routing algorithms, congestion control algorithms, and evaluate network layer protocols for internetworking.

CO5: Analyze transport service, transport protocols, and evaluate UDP and TCP in the internet.

CO6: Understand and evaluate application layer protocols, including DNS, email, WWW, and network management protocols.

UNIT-I

INTRODUCTION: Network applications, network hardware, network software, reference models: OSI, TCP/IP, Internet, Connection oriented network - X.25, frame relay.

THE PHYSICAL LAYER: Theoretical basis for communication, guided transmission media, wireless transmission, the public switched telephone networks, mobile telephone system.

UNIT-II

THE DATA LINK LAYER: Design issues, error detection and correction, elementary data link protocols, sliding window protocols, example data link protocols - HDLC, the data link layer on the internet.

THE MEDIUM ACCESS SUBLAYER: Channel allocations problem, multiple access protocols, Ethernet, Data Link Layer switching, Wireless LAN, Broadband Wireless, Bluetooth.

UNIT-III

THE NETWORK LAYER: Network layer design issues, routing algorithms, Congestion control algorithms, Internetworking, the network layer in the internet (IPv4 and IPv6), Quality of Service.

UNIT-IV

THE TRANSPORT LAYER: Transport service, elements of transport protocol, Simple Transport Protocol, Internet transport layer protocols: UDP and TCP.

UNIT-V

THE APPLICATION LAYER: Domain name system, electronic mail, World Wide Web:

architectural overview, dynamic web document and http.

APPLICATION LAYER PROTOCOLS: Simple Network Management Protocol, File Transfer Protocol, Simple Mail Transfer Protocol, Telnet.

Text Book(s)

1.S. Tanenbaum (2003), Computer Networks, 4th edition, Pearson Education/ PHI, New Delhi, India

Reference Books

1.Behrouz A. Forouzan (2006), Data communication and Networking, 4th Edition, Mc Graw-Hill, India.

2.Kurose,Ross(2010),Computer Networking: A topdown approach,Pearson Education, India.

SUGGESTED CO-CURRICULAR ACTIVITIES & EVALUATION METHODS:

Unit 1: Activity: Hands-on exercises to configure network applications

Evaluation Method: Practical skills in configuring network applications, hardware, and software.

Unit 2: Activity: Protocol Design and Simulation using simulation tools like NS-3 or Cisco Packet Tracer.

Evaluation Method: Students' ability to design and simulate data link layer protocols and multiple access protocols

Unit 3: Activity: Guest Lectures and Workshops on routing algorithms, congestion control, and network layer protocols.

Evaluation Method: Students' participation and understanding demonstrated in guest lectures and workshop

Unit 4: Activity: Network Monitoring and Traffic Analysis using tools like Wireshark

Evaluation Method: Understanding of transport protocols through their analysis of network traffic and identification of UDP and TCP behavior

Unit 5: Activity: Group Projects on Network Application Development

Evaluation Method: Group Project Presentations

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II B.Sc. Honours (Computer Science)

Semester-IV

Data Communication and Computer Networks (Practical) Syllabus

List of Experiments:

1. Understanding various network tools in Windows and Linux
2. Study different types of Network devices and Cables
3. Building a Local Area Network
4. Concept of Network IP Address
5. Introduction to Network Simulator – Packet Tracer (PT)
6. Configuration of a Router using Packet Tracer
7. Implementation of a Network using Packet Tracer
8. Implementation of Static Routing using Packet Tracer
9. Implementation of RIP using Packet Tracer
10. Implementation of OSPF using Packet Tracer
11. Implement DNS using packet tracer
12. Implementation of a VLAN using Packet Tracer

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Semester-IV

Title of the Paper: Database Management System with Oracle

Syllabus

Course Objectives

- 1.The course aims to help the Students will have the expertise in analyzing real time problems and providing appropriate solutions related to Computer Science & Engineering.
2. The Students will have the knowledge of fundamental principles and innovative technologies to succeed in higher studies and research.
3. They continue to learn and to adapt technology developments combined with deep awareness of ethical responsibilities in profession.

Learning Outcomes

CO1: An ability to apply Knowledge of computing and mathematics in Computer Science &Engineering.

CO2: They will analyze a problem, identify and define the computing requirements appropriate to its solution.

CO3: An ability to design, implement and evaluate a computer-based system to meet desired needs with appropriate societal considerations.

CO4:The will have knowledge on to conduct investigations, interpret data and provide conclusions in investigating complex problems related to Computer Science & Engineering.

CO5: An ability to engage in continuing professional development and life-long learning.

Unit 1: Overview of Database Systems: Introduction: Database system, Characteristics (Database Vs File System), Database Users, Advantages of Database systems, Database applications. DBMS Architecture -DBMS vendors and their products.

Data Models: Introduction; types of data models, Concepts of Schema, Instance and data independence; Three tier schema architecture for data independence; Database system structure, environment, Centralized and Client Server architecture for the database.

Case Study:

1. Describe the differences between Database systems and File based systems
2. Study about database models and their advantages and dis-advantages

Unit 2: Relational Model: Introduction to relational model, Codd's rules, concepts of domain, attribute, tuple, relation, constraints (Domain, Key constraints, integrity constraints) and their importance , concept of keys (super key, candidate key, primary key, surrogate key, foreign key) , relational Algebra & relational calculus.

Normalization: Purpose of Normalization or schema refinement, concept of functional dependency, normal forms based on functional dependency(1NF, 2NF and 3 NF), Boyce-codd normal form(BCNF)

Case Study:

Describe Relational model and normalization for database design

Unit 3: Entity Relationship Model: Introduction, Representation of entities, attributes, entity set, relationship, relationship set, constraints, sub classes, super class, inheritance, specialization, generalization using ER Diagrams,

BASIC SQL: Database schema, data types, DDL operations (create, alter, drop, rename), DML operations (insert, delete, update), basic SQL querying (select and project) using where clause, arithmetic & logical operations, aggregation, grouping, ordering.

Case Study:

- 1.Examine issues in data storage and query processing using SQL.
- 2.Create, maintain and manipulate a relational database using SQL

Unit 4: SQL: Nested queries/ sub queries, implementation of different types of joins, SQL functions(Date, Numeric, String, Conversion functions), Creating tables with relationship, implementation of key and integrity constraints, views, relational set operations , Transaction Control Language: commit, Rollback, Savepoint , DCL :Grant, Revoke.

Case Study:

Try to convert some sample data to information and show how it can you be used in decision making.

Unit 5: PL/SQL: Introduction, Structure , Control Structures , Cursors , Procedure , Function , Packages , Exception Handling ,Triggers.

Unstructured database : Introduction and its types


Transaction processing Concepts : Transaction State, Implementation of Atomicity and Durability, Concurrent Executions.

Case Study:

Outline the role and issues in Transaction management of data such as efficiency, privacy, security.

Suggested Text Books

1. Database Management Systems, 3rd Edition ,Raghurama Krishnan, Johannes Gehrke, TMH
2. Database System Concepts,5th Edition ,Silberschatz, Korth, TMH


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II B.Com. Honours (Computer Applications)

Semester-IV

(Practical)

Syllabus

LIST OF EXPERIMENTS

SQL:

Cycle-I: Aim: The marketing company wishes to computerize its operations by using the following tables.

Table Name: Client Master

Description: Used to store client information

Column Name	Data Type	Size	Attribute
CLIENT_NO	Varchar2	6	Primary key
NAME	Varchar2	20	Not null
ADDRESS1	Varchar2	30	
ADDRESSSS	Varchar2	30	
CITY	Varchar2	15	
PINCODE	Varchar2	8	
STATE	Varchar2	15	
BAL_DUE	Number	10,2	

Table Name: Product Master

Description: Used to store product information

Column Name	Data Type	Size	Attribute
PRODUCT_NO	Varchar2	6	Primary key
DESCRIPTION	Varchar2	15	Not null
PROFIT_PERCENT	Number	4,2	Not null
UNIT_MEASUE	Varchar2	10	
QTY_ON_HAND	Number	8	
REORDER_LVL	Number	8	
SELL_PRICE	Number	8,2	Not null, cannot be 0
COST_PRICE	Number	8,2	Not null,cannot be 0

Table Name: Salesman master

Description: Used to store salesman information working for the company.

Column Name	Data Type	Size	Attribute
SALESMAN_NO	Varchar2	6	Primary key
SALESMAN_NAME	Varchar2	20	Not null
ADDRESS1	Varchar2	30	
ADDRESS2	Varchar2	30	
CITY	Varchar2	20	
PINCODE	Number	8	
STATE	Vachar2	20	
SAL_AMT	Number	8,2	Not null, cannotbe0
TGT_TO_GET	Number	6,2	Not null, cannotbe0
YTD_SALES	Number	6,2	Not null
REMARKS	Varchar2	20	

Table Name: SALES_ORDER

Description: Used to store client orders

Column Name	Data Type	Size	Attribute
ORDER_NO	Varchar2	6	Primary key
CLIENT_NO	Varchar2	6	Foreign Key
ORDER_DATE	Date		
DELY_ADDRESS	Varchar2	25	
SALESMAN_NO	Varchar2	6	Foreign Key
DELY_TYPE	Char	1	Delivery:part(p)/full(f)anddefault' F'
BILL_YN	Char	1	
DELY_DATE	Date		Can'tbe lessthanorderdate
ORDER_STATUS	Varchar2	10	Values("InProgress","Fulfilled", "Back Order", "Cancelled)

Table Name: SALES_ORDER_DETAILS

Description:Used to store client's order with details of each product ordered.

ColumnName	Data Type	Size	Attribute
ORDER_NO	Varchar2	6	Primary key references SALES_ORDER table
PRODUCT_NO	Varchar2	6	Foreign Key references SALES_ORDER_table
QTY_ORDERED	Number	8	
QTY_DISP	Number	8	
PRODUCT_RATE	Number	10,2	Foreign Key

Solve the following queries by using the above tables.

1. Retrieve the list of names, city, and the state of all the clients.
2. List all the clients who are located in 'Mumbai' or 'Bangalore'.
3. List the various products available from the product_mastertable.
4. Find the names of salesmen who have a salary equal to Rs.3000.
5. List the names o fall clients having 'a' as the second letter in their names.
6. List all clients whose Baldue is greater than value 1000.
7. List the clients who stay in a city whose first letter is 'M'.
8. List all information from the sales-order table for orders placed in the month of July.
9. List the products whose selling price is greater than 1000 and less than or equal to 3000.
10. Find the products whose selling price is greater than 1000 and also find the new selling price as the original selling price of 0.50.

Cycle-II Supplier

Aim: A manufacturing company deals with various parts and various suppliers supply these parts. It consists of three tables to record its entire information. Those are as follows.

Supplier (Supplier_No, Sname, City, status) Part(Part_no, pname, color, weight, city, cost)

Shipment (supplier No, Part_no, city) JX (project_no, project_name, city)

SPJX (Supplier no, part_no, project_no,city)

1. Get supplier numbers and status for suppliers in Chennai with status>20.
2. Get project names for projects supplied by supplier 'S'.
3. Get colors of parts supplied by supplier S.
4. Get part numbers for parts supplied to any project in Mumbai.

5. Find the id's of suppliers who supply a red or pink parts.

Cycle-III Employee Database

Aim: An enterprise wishes to maintain a database to automate its operations. Enterprise is divided into certain departments and each department consists of employees. The following two tables describe the automation schemas.

Emp(Empno, Ename, Job, Mgr, Hiredate, Sal, Comm, Deptno)

Dept(Deptno, Dname, Loc)

1. List the details of employees who have joined before the end of September '81.
2. List the name of the employee and designation of the employee, who does not report to anybody.
3. List the name, salary and PF amount of all the employees (PF is calculated as 10% of salary)
4. List the names of employees who are more than 2 years old in the organization.
5. Determine the number of employees, who are taking commission.
6. Update the employee salary by 20%, whose experience is greater than 12 years.
7. Determine the department does not contain any employees.
8. Create a view, which contains employee name and their manager names working in sales department.
9. Determine the employees, whose total salary is like the minimum salary of any department.
10. List the department numbers and number of employees in each department.

PL/SQL PROGRAMS

1. Write a PL/SQL program to check the given string is palindrome or not.
2. The HRD manager has decided to raise the employee salary by 15% write a PL/SQL block to accept the employee number and update the salary of that employee. Display appropriate messages based on the existence of the record in the Emp table.
3. Write a PL/SQL program to display the top 10 rows in the Emp table based on their job and salary.
4. Write a PL/SQL program to raise the employee salary by 10% for department number 30 people and also maintain the raised details in the rais table.
5. Create a procedure to update the salaries of Employees by 20%, for those who are not getting commission
6. Write a PL/SQL procedure to prepare an electricity bill by using following table.
Table used: Elect

Name	Null?	Type
MNNO	NOT NULL	NUMBER(3)
CNAME		VARCHAR2(20)
CUR_READ		NUMBER(5)
PREV_READ		NUMBER(5)
NO_UNITS		NUMBER(5)
AMOUNT		NUMBER(8,2)
SER_TAX		NUMBER(8,2)
NET_AMT		NUMBER(9,2)

7. Create a trigger to avoid any transactions (insert, update, delete) on EMP table on Saturday & Sunday.

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II B.Sc. Honours (Computer Science)
Semester-III

Title of the Paper: Object Oriented Programming Using Java

MODEL QUESTION PAPER

Time: 3 Hours

Max Marks: 70

Section-A

I. Answer any FIVE questions. Each Question Carries 4 Marks (5 X 4= 20 M)

1. Define object-oriented programming and how it differs from procedural programming.
2. What are the key features of Java?
3. Explain the use of command-line arguments in Java.
4. What is the purpose of the 'this' keyword in Java?
5. Define inheritance and its importance in object-oriented programming.
6. What is method overriding, and how does it relate to polymorphism?
7. How are interfaces different from abstract classes in Java?
8. What is the role of the 'try', 'catch', and 'finally' blocks in exception handling?
9. Explain the differences between multiple processes and multiple threads.
10. What is a layout manager in GUI programming with Swing?

Section-B

II. Answer All question. Each Question Carries 10 Marks (5 X 10= 50 M)

11. Describe the basic concepts of object-oriented programming, and explain how they are implemented in Java.

(OR)

12. Discuss the use of control statements in Java with examples.
13. Explain the usage of arrays and string manipulation methods in Java.

(OR)

14. What are constructors in Java? Explain the concept of overloading constructors with examples.

15. Discuss the importance of polymorphism in Java, with examples of dynamic binding and method overriding.

(OR)

16. Explain the concept of abstract classes and methods in Java. Provide examples.

17. How is exception handling managed in Java? Discuss the types of exceptions and provide examples of checked and unchecked exceptions.

(OR)

18. Describe thread synchronization and inter-thread communication with examples.

19. Explain the MVC architecture in Swing GUI programming and describe the usage of any two layout managers.

(OR)

20. Discuss event handling in Java. Explain how mouse and keyboard events are handled.

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II B.Sc. Honours (Computer Science)

Semester-III

Title of the Paper: Data Structures Using C
MODEL QUESTION PAPER

Time: 3 Hours

Max Marks: 70

Section-A

I. Answer any FIVE questions. Each Question Carries 4 Marks (5 X 4= 20 M)

1. What is space complexity, and how does it affect algorithm performance?
2. Describe the different types of data structures with examples.
3. Explain how linked lists are represented in memory.
4. What is the advantage of a circular singly linked list over a singly linked list?
5. How is a stack represented using an array?
6. What are circular queues, and how are they different from linear queues?
7. What is the difference between linear search and binary search?
8. Explain the working of insertion sort.
9. What is a complete binary tree, and how does it differ from a regular binary tree?
10. What is the adjacency matrix representation of a graph?

Section-B

II. Answer All question. Each Question Carries 10 Marks (5 X 10= 50 M)

11. Define and explain asymptotic notation with examples.
(OR)
12. Write an algorithm for inserting an element into a two-dimensional array.
13. Explain the different types of linked lists and their advantages and disadvantages.
(OR)
14. Write the algorithm to traverse a doubly linked list and explain its time complexity.
15. Discuss the tower of Hanoi problem and its solution using recursion.
(OR)
16. Explain the implementation of circular queues using a linked list with an algorithm.
17. Compare and contrast binary search and indexed sequential search.
(OR)
18. Write an algorithm for merge sort and explain its time complexity.
19. Discuss binary tree traversal methods with examples.
(OR)
20. Explain the concept of graph traversal and compare DFS and BFS



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II B.Sc. Honours (Computer Science)
Semester-III
Title of the Paper: Computer Organization
MODEL QUESTION PAPER

Time: 3 Hours

Max Marks: 70

Section-A

I. Answer any FIVE questions. Each Question Carries 4 Marks

(5 X 4= 20 M)

1. Write the purpose of register transfer language in computer organization.
2. Define bus and memory transfers with a brief example.
3. What are addressing modes in CPU architecture?
4. Explain the concept of control memory.
5. What is associative memory?
6. Describe the concept of memory hierarchy.
7. What are peripheral devices in a computer system?
8. Define asynchronous data transfer.
9. How is floating point representation used for data in computers?
10. What is the difference between instruction pipeline and arithmetic pipeline?

Section-B

II. Answer All question. Each Question Carries 10 Marks

(5 X 10= 50 M)

11. Discuss the different types of micro-operations and their functions within a CPU.
(OR)
12. Explain the basic instruction cycle and its phases in computer organization.
13. Describe micro-programmed control and hard-wired control. Compare both.
(OR)
14. Explain the various instruction formats in a Central Processing Unit (CPU) with examples.
15. Explain the working and importance of cache memory in computer systems.
(OR)
16. Discuss the mapping techniques used in cache memory.
17. Explain programmed I/O and Direct Memory Access (DMA) with examples.
(OR)
18. Discuss the role of an Input-Output Processor (IOP) and how it works in managing data transfer.
19. Describe the algorithm for floating-point addition and subtraction
(OR)
20. Explain parallel processing and describe the concepts of pipelining in computer architecture.

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II B.Sc. Honours (Computer Science)

Semester-III

Title of the Paper: Operating Systems
MODEL QUESTION PAPER

Time: 3 Hours

Max Marks: 70

Section-A

I. Answer any FIVE questions. Each Question Carries 4 Marks

(5 X 4= 20 M)

1. What is an operating system and its basic functions?
2. Differentiate between time-sharing and multiprogramming systems.
3. What is the role of system calls in an operating system?
4. Define process hierarchy and explain its significance.
5. What is deadlock, and what are the necessary conditions for its occurrence?
6. Explain the concept of semaphores in process synchronization.
7. What is paging in memory management?
8. Differentiate between physical and virtual address space.
9. Explain the concept of file allocation methods.
10. What are pipes in operating systems and how are they used?

Section-B

II. Answer All question. Each Question Carries 10 Marks

(5 X 10= 50 M)

11. Discuss the history and evolution of operating systems and how they have shaped modern computing.
(OR)
12. Compare and contrast real-time operating systems with batch processing systems.
13. Explain the various process scheduling algorithms, with a focus on non-preemptive and preemptive scheduling.
(OR)
14. Discuss the threading model in operating systems and explain the role of thread libraries.
15. What is deadlock avoidance? Discuss various strategies for avoiding deadlock in a system.
(OR)
16. Explain the classical synchronization problem of producer-consumer using semaphores.
17. Discuss the fixed and variable partitioning strategies in memory allocation.
(OR)
18. Explain virtual memory and the paging technique used in modern operating systems.
19. Describe disk scheduling algorithms and their significance in improving system performance.
(OR)
20. Explain the concept of shared memory and how it helps in inter-process communication.

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II B.Com. Honours (Computer Applications)

Semester-III

Title of the Paper: E COMMERCE AND WEB DESIGNING
MODEL QUESTION PAPER

Time: 3 Hours

Max Marks: 70

Section-A

I. Answer any FIVE questions. Each Question Carries 4 Marks

(5 X 4= 20M)

1. Explain about E-Commerce with 5-C Model.
2. Explain about actors and stakeholders.
3. Explain about PROCUREMENT PLATFORM
4. Explain about differences between B2b and B2c.
5. Write important technology for technology in ISM.
6. Explain about Cyber Money.
7. Explain about HTML attributes.
8. Explain about block quote elements in HTML.
9. Explain about span and div elements.
10. Explain about RGB values for color.

Section-B

II. Answer All question. Each Question Carries 10 Marks

(5 X 10= 50 M)

11. Explain about advantages and disadvantages in e-commerce.
(OR)
12. Describe seven steps for fundamental sales process in e-commerce.
13. Explain about the process model and its variants.
(OR)
14. Explain about B2B Basics. The different types of B2B e-commerce.
15. Explain about foundations of risk management.
(OR)
16. Explain about payment procedures.
17. What is HTML? Explain the structure of HTML program.
(OR)
18. Explain different types of text elements in HTML.
19. What is CSS? Explain about CSS syntax and styles.
(OR)
20. Explain about font properties in CSS.

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II B.Com. Honours (Computer Applications)

Semester-III

Title of the Paper:
MODEL QUESTION PAPER

Time: 3 Hours

Max Marks: 70

Section-A

I. Answer any FIVE questions. Each Question Carries 4 Marks (5 X 4= 20M)

1. Define digital marketing and explain its key components.
2. What are the advantages of digital marketing over traditional marketing?
3. Briefly describe the types of online advertising.
4. Explain the significance of A/B testing in online advertising campaigns.
5. What are the essential elements of an effective e-mail marketing strategy?
6. Discuss the importance of segmentation in e-mail marketing.
7. List and explain the popular social media platforms used for marketing purposes.
8. What is social media engagement, and why is it crucial for businesses?
9. Explain the importance of keyword research in SEO.
10. Differentiate between on-page and off-page SEO techniques.

Section-B

II. Answer All question. Each Question Carries 10 Marks (5 X 10= 50 M)

11. Explain the key challenges faced in digital marketing and how to overcome them.
(OR)
12. Discuss the role of data analytics in shaping digital marketing strategies.
13. Describe the different types of online advertising and their effectiveness.
(OR)
14. Explain the importance of targeting and personalization in online advertising.
15. Outline the steps involved in creating a successful e-mail marketing campaign.
(OR)
16. Discuss the challenges and solutions for ensuring e-mail deliverability and open rates.
17. Examine the strategies used in social media marketing to build brand loyalty.
(OR)
18. Discuss the impact of social media algorithms on content visibility and marketing strategies
19. Describe the process of optimizing a website for search engines.
(OR)
20. Explain the significance of back links in SEO and how to build them effectively

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II BA/BBA/B.Com/B.Sc

Semester-III

Title of the Paper: Information and Communication Technology

MODEL QUESTION PAPER

Time: 2 Hours

Max Marks: 50

SECTION-A

Answer any FIVE of the following questions.

(5 × 10 = 50)

1. Explain the term "Internet applications" with examples.
2. What is meant by Internet Addressing?
3. Explain about social media?
4. What are the components of an E-mail message?
5. Explain about Username and password in detail
6. Describe the purpose of Google forms & Google documents.
7. What are the copyright issues associated with the Internet?
8. What measures can be taken to ensure secure E-mails?
9. Describe the concept of E-mail threats and provide examples.
10. Explain about the advantages of Swayam and NPTEL.

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II BA/BBA/B.Com/B.Sc

Semester-III

Title of the Paper: Information and Communication Technology

Blue Print

Time: 2 Hours

Max Marks: 50

SECTION-A

Answer any FIVE of the following questions.

(5 × 10 = 50)

Topics	Questions Given	No. of Questions to be Answered	Allotted Marks
UNIT-1	3	05	50
UNIT-2	3		
UNIT-3	4		

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II B.Sc. Honours (Computer Science)
Semester-IV
Title of the Paper: Database Management Systems
MODEL QUESTION PAPER

Time: 3 Hours

Max Marks: 70

Section-A

I. Answer any FIVE questions. Each Question Carries 4 Marks

(5 X 4= 20 M)

1. Define Data, Information with examples.
2. List any five drawbacks of File Based Systems?
3. Define generalization and specialization with examples.
4. Write a short note on different types of attributes.
5. What are Codd's Rules? Mention any five rules.
6. What is Tuple Relational Calculus? Explain.
7. List any four aggregate functions in SQL and explain.
8. What is View in SQL? Explain how it is created?
9. Write the basic structure of a PL/SQL block.
10. What is PL/SQL? How is it different from SQL?

Section-B

II. Answer All question. Each Question Carries 10 Marks

(5 X 10= 50 M)

11. Explain the classification of DBMS in detail.

OR

12. Describe the three-schema architecture with a neat diagram.

13. Explain the basic building blocks of an ER diagram with examples.

OR

14. Discuss the IS-A relationship and attribute inheritance in EER.

15. What is Normalization? Explain 1NF, 2NF, 3NF in detail?

OR

16. Discuss different types of keys in the relational model with examples.

17. Explain different categories of SQL commands with examples (DDL, DML and DCL).

OR

18. Discuss JOIN operations in SQL: INNER JOIN, LEFT JOIN, RIGHT JOIN and FULL JOIN with examples.

19. Describe PL/SQL data types and operator precedence in detail.

OR

20. What are database triggers? Explain BEFORE and AFTER triggers with examples.

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II B.Sc. Honours (Computer Science)

Semester-IV

Title of the Paper: Object Oriented Software Engineering
MODEL QUESTION PAPER

Time: 3 Hours

Max Marks: 70

Section-A

I. Answer any FIVE questions. Each Question Carries 4 Marks

(5 X 4= 20 M)

1. Define software engineering. Why is it important?
2. Explain polymorphism with a small code snippet or example.
3. Define software requirement specification (SRS). What are its key components?
4. What are use cases? Give an example.
5. Define unit testing with an example.
6. Explain the importance of code quality in software construction.
7. What is the need for software version control?
8. Define refactoring. Give two common refactoring techniques.
9. What is the purpose of Agile software development?
10. What are Scrum methodologies? Name any two.

Section-B

II. Answer All question. Each Question Carries 10 Marks

(5 X 10= 50 M)

11. Describe the Software Development Life Cycle (SDLC) in detail.

OR

12. Explain the main concepts of Object-Oriented Programming (OOP) with examples.

13. What are design patterns? Describe any two design patterns with UML examples.

OR

14. Describe different UML modelling techniques with suitable diagrams.

15. Explain various levels of software testing with examples: Unit, Integration and System testing.

OR

16. Explain the basic concepts of software construction.

17. Explain the process of code review and code inspection. How do they improve software quality?

OR

18. Explain the basics of software maintenance. What are the different types of maintenance?

19. Explain Model-Driven Engineering (MDE). How does it help in building software?

OR

20. Write a detailed note on Service-Oriented Architecture (SOA). How does it support modern applications?

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II B.Sc. Honours (Computer Science)

Semester-IV

Title of the Paper: DATA COMMUNICATION AND COMPUTER NETWORKS
MODEL QUESTION PAPER

Time: 3 Hours

Max Marks: 70

Section-A

I. Answer any FIVE questions. Each Question Carries 4 Marks

(5 X 4= 20 M)

1. Explain briefly LAN and WAN.
2. Define guided transmission media with two examples.
3. What are the design issues in the data link layer?
4. What is the role of the medium access control (MAC) sublayer?
5. What is the difference between IPv4 and IPv6?
6. Write a short note on internetworking.
7. Write a short note on Connection Oriented and Connection less services.
8. What is the role of the transport layer in networking?
9. What is FTP? How does FTP differ from HTTP?
10. Write a short note on the TELNET.

Section-B

II. Answer All question. Each Question Carries 10 Marks

(5 X 10= 50 M)

11. Explain the OSI model with its seven layers and their functions.
OR
12. Explain the architecture and working of the Public Switched Telephone Network (PSTN).
13. What are Error Detection and Error Correction Techniques in detail?
OR
14. Compare Circuit, Packet and Message Switching.
15. What is Routing? Explain any two routing algorithms in detail.
OR
16. Explain IPV4 in detail with a neat diagram.
17. Explain UDP and TCP protocols in detail.
OR
18. Explain the working of a simple transport protocol.
19. Explain the Domain Name System (DNS) in detail.
OR
20. Describe how electronic mail works.

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II B.Com. Honours (Computer Applications)

Semester-IV

**Title of the Paper: DATABASE MANAGEMENT SYSTEM WITH ORACLE
MODEL QUESTION PAPER**

Time: 3 Hours

Max Marks: 70

Section-A

I. Answer any FIVE questions. Each Question Carries 4 Marks

(5 X 4= 20M)

1. What is a Database Management System (DBMS), and what is its purpose?
2. Define the following: (a) Attribute (b) Tuple (c) Relation (d) Domain.
3. Explain the concept of Generalization using ER diagram.
4. Explain TCL commands.
5. Explain the structure of a PL/SQL block.
6. What is a data model, and why is it important in database design?
7. What are integrity constraints?
8. Explain DDL operations.
9. Write a SQL query to retrieve all columns from a table called employees.
10. Explain the difference between a predefined exception and a user-defined exception in PL/SQL.

Section-B

II. Answer All question. Each Question Carries 10 Marks

(5 X 10= 50 M)

11. Explain three tier schema architecture for data independence.

OR

12. Explain types of database users. Mention some of the advantages of database systems.

13. Explain Relational algebra operations in brief with examples.

OR

14. What are super key and candidate key? Explain briefly with example.

15. What are aggregate functions in SQL? List them and briefly describe their purpose.

OR

16. What is ORDER BY and GROUP BY clauses in SQL? Explain briefly.

17. Explain types of joins in SQL with example.

OR

18. What is a view in SQL? Explain its purpose with example.

19. What is a PL/SQL procedure? Explain its structure and provide an example of a simple procedure.

OR

20. What is a cursor in PL/SQL? Explain the difference between implicit and explicit cursors in PL/SQL.

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Panel of Examiners & Question Paper setters


Panel of Examiners

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Pictures & Attendance Sheet

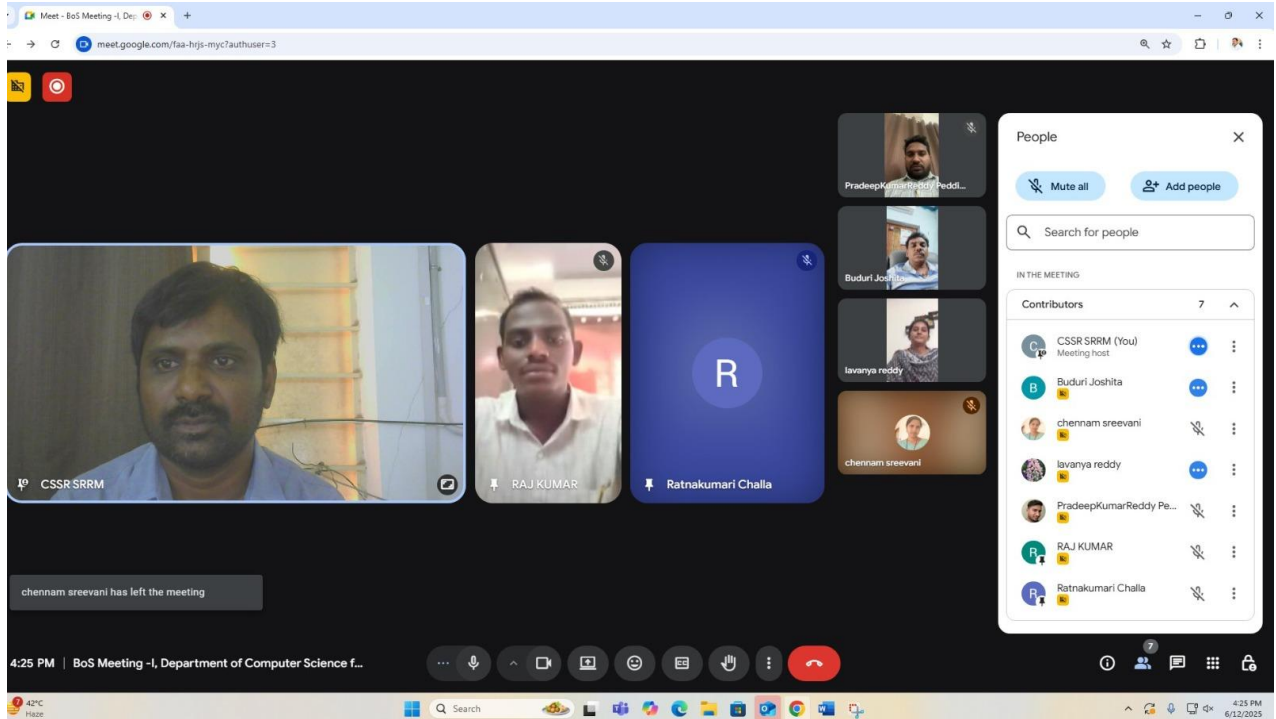
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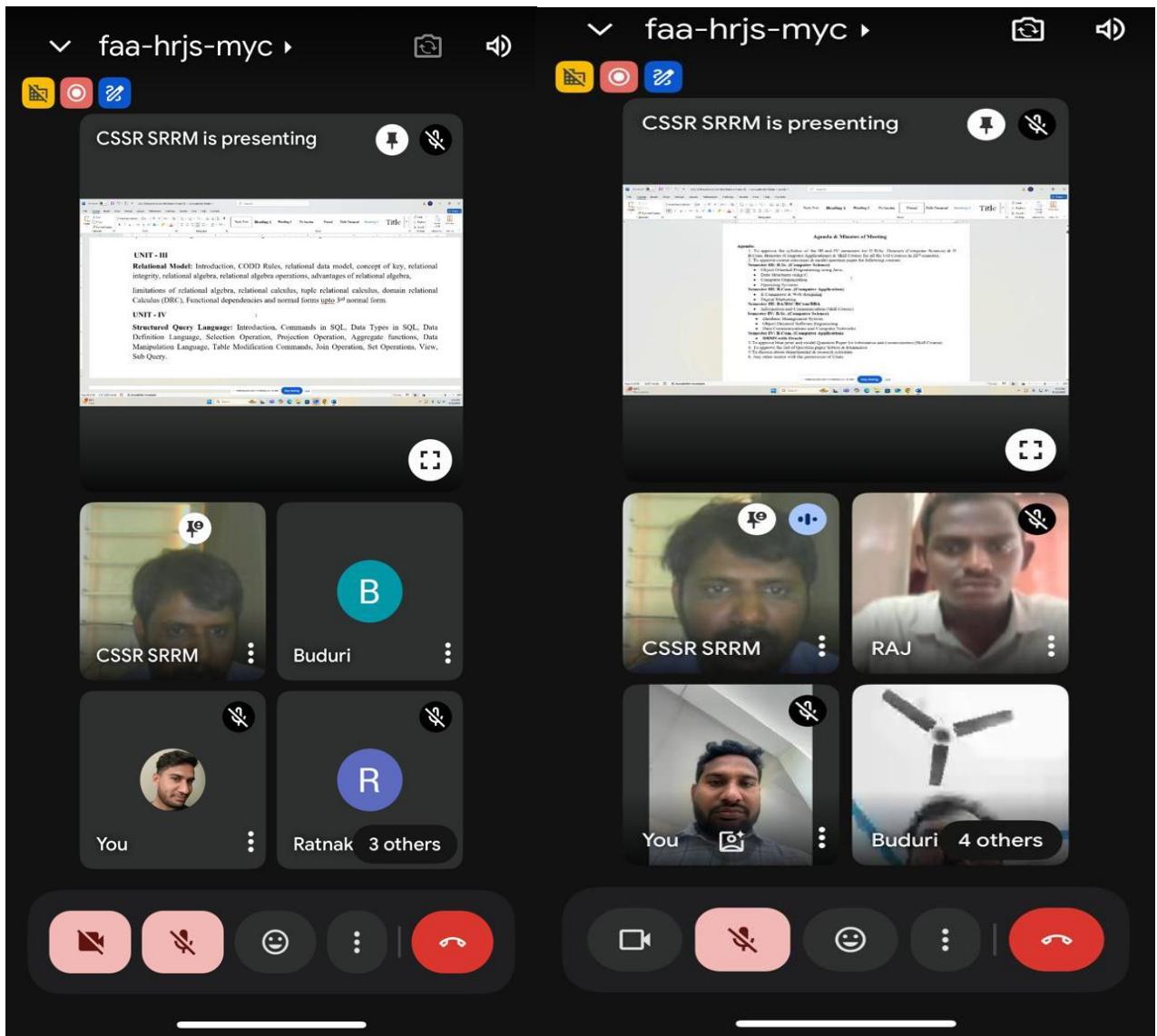
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Attendance Sheet:

	A	B	C	D	E	F	G
1	First name	Last name	Email	Duration	Time joined	Time exited	
2	Ratnakumari	Challa	ratn*****@***.com	57 min	3:28 PM	4:25 PM	
3	Buduri	Joshita	bred*****@***.com	1 hr 32 min	2:53 PM	4:25 PM	
4	RAJ	KUMAR	gong*****@***.com	1 hr 33 min	2:53 PM	4:25 PM	
5	PradeepKumarReddy	PeddiReddy	prad*****@***.com	1 hr 34 min	2:51 PM	4:25 PM	
6	lavanya	reddy	lava*****@***.com	1 hr 27 min	2:58 PM	4:25 PM	
7	LOKESWARA	REDDY	loke*****@***.com	1 hr 16 min	2:51 PM	4:13 PM	
8	Cssrcomputer	science&applications	cssr*****@***.com	23 min	3:01 PM	3:25 PM	
9	chennam	sreevani	chen*****@***.com	1 hr 14 min	2:58 PM	4:25 PM	
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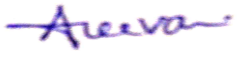
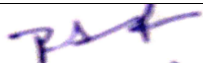
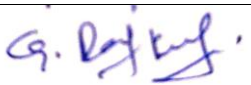
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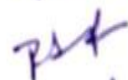





By
 Aravind
 P.S.
 G. Rajesh.

Attendance Sheet

Sl. No.	Category	Name	Designation	Signature
1	In charge of the Department	K. Sreenivas Reddy	Head	
2	Faculty Member	I.Sreevani	Lecturer	
3	Faculty Member	P. Pradeep Kumar Reddy	Lecturer	
4	Faculty Member	G. Raj Kumar	Lecturer	
5	Two experts from Outside the Parent University nominated by Academic Council	Dr. Ch.Ratna Kumari Assistant Professor RGUKT-Andhra Pradesh Ph: 9441603196 Email: ratnamala3784@gmail.com	Assistant Professor	Online attended
		N. Lavanya Department of Computer Science Sri Venkateswara Degree & PG College, Ananthapuram Ph: 9494931000	Lecturer	Online attended
6	One Expert Nominated by Vice Chancellor	Dr.B. Reddiaah Department of Computer Science & Technology Yogi Vemana University, Kadapa Ph:9000601602 Email: b.reddaiah@yyu.edu.in	Associate Professor	Online attended
7	One representative from Industry/ Corporate allied areas nominated by the Principal	G. Vinay Kumar, Jyothi & Company, Mandy Complex, Proddatur, YSR Ph:9246942311	Industrialist	Absent
8	Alumni nominated by the Principal	Y.C. Lokeswara Reddy, M.Sc. (Computer Science) Ph:9652262519	Alumni	Online attended

CSSR & SRRM DEGREE & PG COLLEGE
(Autonomous)

Kamalapuram - 516289, Kadapa, A.P.



Board of Studies
Minutes of the Meeting-I (Virtual)
Academic Year: 2025-2026

Department of Computer Science & Applications

Dated: 12/06/2025

CONTENTS

1. Agenda & Minutes of Meeting
2. Course Structure
3. Syllabus with Course Outcomes
4. Model Question Paper
5. Pics & Signature Sheet



Department of Computer Science & Applications

The Board of studies meeting – I for the academic year 2025-2026 for the Department of Computer Science & Applications was held through Virtual Mode on 12/06/2025 at 3:00 p.m. in the Department of computer science & Application.

Agenda & Minutes of Meeting

Agenda:

1. To approve the syllabus of the III and IV semesters for II M.Sc. Computer Science
2. To approve course outcomes & model question paper for following courses:

Semester III: M.Sc. Computer Science

- Python Programming.
- Big Data Analytics.
- Cryptography and Network Security
- Computer Ethics (Open Elective) for other PG Course (M.Com)
- Data Visualization Tools (Skill Oriented Course) only for M.Sc. Computer Science

Semester IV: M.Sc. Computer Science

- Cloud Computing
 - Artificial Intelligence and Machine Learning
 - Internet of Things
 - Software Project Management (Internal Elective)
3. To approve blue print and model Question Paper for Data Visualization Tools (Skill Oriented Course)
 4. To approve & discuss the CIA & SEE pattern and practical for Data Visualization Tools (Skill Oriented Course)
 5. Any other matter with the permission of Chair.

RESOLUTIONS

In BoS meeting, all the panel members have discussed and unanimously approved the following agendas:

1. The members of board discussed and approved the course structure for PG course IIIrd & IVth semester of M.Sc Computer Science.
2. The Members approved the Course outcomes & Model Question Paper for the subjects/papers.
3. The members of the BoS approved blue print and model Question Paper for Data Visualization Tools (Skill Oriented Course)
4. The members of the BoS approved the pattern of CIA & SEE and practical for 100 marks

CIA & SEE: 50 Marks

Continuous Internal Assessment:

10 marks for CIA

Semester End Examinations:

40 marks for SEE

The semester end examination is for 40 marks with the time duration of 2 Hours

Practical's:50 Marks

The semester end examination is for 50 with the time duration of 2 hours.

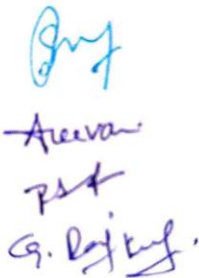
For Record Writing & Submission: 10 Marks

For Program Writing & Execution: 30 Marks

For Viva-Voce : 10 Marks

Total : 50 Marks

5. The members of BoS decide to organise departmental activities and to enhance the research activities


A series of handwritten signatures in blue and purple ink, including a large blue signature at the top, followed by 'A. Arora', 'P. S.', and 'G. Rajkumar'.

II M.Sc. Computer Science

Semester-III

Course Structure

Sl.No	Title of Paper	No. Hours/ week	Credits	CIA	SEE	Total
1	Python Programming	4	4	25	75	100
2	Big Data Analytics	4	4	25	75	100
3	Cryptography and Network Security	4	4	25	75	100
4	Computer Ethics(Open Elective)	4	4	25	75	100
5	Data Visualization Tools (Skill Oriented Course)Theory	4	4	10	40	50
	Data Visualization Tools (Skill Oriented Course) Practical	2		-	50	50
6	Python Programming Practical	4	4	-	100	100

Computer Ethics (Open Elective)-For Other PG Courses (M.Com)

II M.Sc. Computer Science

Semester-IV

Course Structure

Sl.No	Title of Paper	No. Hours/ week	Credits	CIA	SEE	Total
1	Cloud Computing	4	4	25	75	100
2	Artificial Intelligence and Machine Learning	4	4	25	75	100
3	Internet of Things	4	4	25	75	100
4	Software Project Management(Internal Elective)	4	4	25	75	100
5	Cloud Computing Practical	4	4	-	100	100
6	Project Work	4	4	-	100	100

Software Project Management (Internal Elective)-Within the Department

II M.Sc. Computer Science

Semester-III

PYTHON PROGRAMMING

COURSE OBJECTIVES:

- To understand programming concepts and key feature of Python including Files I/O
- To study OOPs concepts of Python and to understand relationship between class and object in Python
- To write efficient programming using Python and graphical user interface (GUI) programming by Python.
- To study database concepts and database connection in Python and also different operations on database

COURSE OUTCOME:

CO1: Learn and implement programming skills in Python and learn language elements and characteristics, including data types, operators, and control structures.

CO2: Implementing Python OOPs concepts in writing programs.

CO3: Learn to develop applications, graphical user interface (GUI).

CO4: Learn to design and connect database using Python.

UNIT1:

Python Features, Python History, Python Applications, Python Example, Variables, Data Types, Keywords, Literals, Operators, Comments, If else, Loops, For Loop, While Loop, Break, Continue, Pass, Strings, Lists, Tuples, List Vs Tuple, Sets, Dictionary, Functions, Built-in Functions, Lambda Functions,

Files I/O, Modules, Exceptions, Date, Regex, Sending Email, Read CSV File, Write CSV File, Read Excel File, Write Excel File, Assert, List Comprehension, Collection Module, Math Module, OS Module, Random Module, Statistics Module, Sys Module, IDEs, Arrays, Command Line Arguments

UNIT 2:

Python OOPs Concepts: Python OOPs Concepts, Creating classes in Python, Creating an instance of the class, Delete the Object, Constructors, Creating the constructor in python, Python Non-Parameterized Constructor, Parameterized Constructor, default Constructor, Python built-in class functions, Built-in class attributes, Inheritance, Types of inheritances, The is sub class(sub, sup) method, The is instance (obj, class) method, method overloading, Data abstraction in python

UNIT 3:

GUI Programming : Python Tkinter (GUI), Button, Canvas, Check button, Entry, Frame, Label, List box, Menu button, Menu, Message, Radio button, Scale, Scrollbar, Text open link, Label, Frame, Message Box.

UNIT 4:

Python Database connection: Environment Setup, Database Connection, Creating New Database, Creating Tables, Insert Operations, Read Operations, Update Operations, Join Operations, Performing Transactions

TEXT BOOKS:

1. Kenneth A. Lambert, The Fundamentals of Python: First Programs, 2011, Cengage Learning.
2. Think Python First Edition, by Allen B. Downey, Orielly publishing

REFERENCE BOOKS:

1. Introduction to Computation and Programming Using Python. John V. Guttag, The MIT Press.
2. James Payne, Beginning Python using Python 2.6 and Python 3, Wrox publishing
3. Paul Gries, Practical Programming: An Introduction to Computer Science using Python 3, The Pragmatic Bookshelf, 2nd edition (4 Oct. 2013)
4. Charles Dierach, Introduction to Computer Science using Python

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G. Rajkumar.

II M.Sc. Computer Science **Semester-III**

BIG DATA ANALYTICS

COURSE OBJECTIVES:

- To explore the fundamental concepts of big data analytics
- To understand the concept of Hadoop and learn to build blocks using Hadoop with different nodes.
- To learn different components of Hadoop and to understand Hadoop file system.
- To understand the applications using Map Reduce Concept

COURSE OUTCOME:

CO1: Work with big data platform and understand the fundamentals of various big data analysis techniques

CO2: Analyze Hadoop concepts for building blocks with different nodes.

CO3: Understand different components of Hadoop and file system of Hadoop.

CO4: Analyze the HADOOP and Map Reduce technologies associated with big data analytics

CO5: Explore the applications of Big Data

UNIT 1:

Introduction to Big Data: Big Data-definition, Characteristics of Big Data (Volume, Variety, Velocity), Data in the Warehouse and Data in Hadoop, why is Big Data Important? Patterns for Big Data Development

UNIT 2:

Introduction to Hadoop: Hadoop- definition, understanding distributed systems and Hadoop, Comparing SQL databases and Hadoop, Understanding Map Reduce, counting words with Hadoop-running your first program, History of Hadoop, Starting Hadoop - The building blocks of Hadoop, Name Node, Data Node, Secondary Name Node, Job Tracker and Task Tracker, Map Reduce -A Weather Dataset, Analyzing the Data with Unix Tools, Analyzing the Data with Hadoop, Scaling Out, Hadoop Streaming, Hadoop Pipes.

UNIT 3:

HDFS: Components of Hadoop -Working with files in HDFS, Anatomy of a Map Reduce program, Reading and writing

The Hadoop Distributed File system -The Design of HDFS, HDFS Concepts, The Command-Line Interface, Hadoop File system, The Java Interface, Data Flow, Parallel Copying with distcp, Hadoop Archives

UNIT 4:

Map Reduce Advanced Programming: Writing basic Map Reduce programs - Getting the patent data set, constructing the basic template of a Map Reduce program, Counting things, Adapting for Hadoop's API changes, Streaming in Hadoop, Improving performance with combiners, Advanced Map Reduce – Chaining Map Reduce jobs, joining data from different sources, creating a Bloom filter

TEXT BOOKS:

1. Dirk deRoos, Chris Eaton, George Lapis, Paul Zikopoulos, Tom Deutsch ,—Understanding Big Data Analytics for Enterprise Class Hadoop and Streaming Data, 1st Edition, TMH,2012.
2. Hadoop: The Definitive Guide by Tom White, 3rd Edition, O'reilly
3. Hadoop in Action by Chuck Lam, MANNING Publ.
4. Hadoop in Practice by Alex Holmes, MANNING Publ.

REFERENCE BOOKS:

1. Data Divination: Big Data Strategies, 1st Edition, Pam Baker, Bob Gourley, Cengage

II M.Sc. Computer Science

Semester-III

CRYPTOGRAPHY AND NETWORK SECURITY

COURSE OBJECTIVES:

- To understand basics of Cryptography and Network Security.
- To be able to secure a message over insecure channel by various means
- To learn about how to maintain the Confidentiality, Integrity and Availability of a data.
- To understand various protocols for network security to protect against the threats in the networks.

COURSE OUTCOME:

CO1: Understand the most common type of cryptographic algorithm

CO2: Provide security of the data over the network.

CO3: Understand the Public-Key Infrastructure

CO4: Understand security protocols for protecting data on networks

CO5: Understand vulnerability assessments and the weakness of using passwords for authentication

CO6: Be able to configure simple firewall architectures

CO7: Do research in the emerging areas of cryptography and network security.

UNIT 1:

Introduction: Security trends, OSI Security Architecture, Security Attacks, services and mechanisms, Model for Network Security.

Classical techniques: Symmetric Cipher model, Substitution Techniques, Transposition Techniques, Steganography.

Modern techniques: Simplified DES, block cipher principles, data encryption standard, strength of DES, differential and linear crypt analysis, block cipher design principles and modes of operations. Algorithms: Triple DES, international data encryption algorithm, characteristics of advanced symmetric block ciphers.

UNIT 2:

Conventional encryption: Placement of encryption function, traffic confidentiality, key distribution.

Public key cryptography: Principles of public key cryptosystems, RSA algorithm, key management, Diffie- Hellmen key exchange.

Message authentication and hash functions: Authentication requirements and functions, Message Authentication, Hash functions, security of hash functions and Macs

UNIT 3:

Authentication applications: Kerberos, X.509 directory authentication service. Electronic mail security: Pretty good privacy, S/MIME.

UNIT 4:

System Security: Intruders, Intrusion detection, Password management. Malicious Software: Virus and related threats, Virus counter measures. Firewall: Firewall design principles, Trusted systems.

TEXT BOOKS:

1. Cryptography and Network Security: Principles and Practice – William Stallings, Pearson Education.
2. Network Security Essentials (Applications and Standards) by William Stallings, Pearson Education.

REFERENCE BOOKS:

1. Fundamentals of Network Security by Eric Maiwald (Dreamtech Press)
2. Network Security – Private Communication in a Public World by Charlie kaufman, Radia Perlman and Mike Speciner, Pearson/PHI.
3. Introduction to Cryptography, Buchmann, Springer.

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G. Kaufman.

II M.Sc. Computer Science

Semester-III

COMPUTER ETHICS

COURSE OBJECTIVES:

- To provide knowledge about the ethical issues that arise as a result of increasing use of computers
- To discuss the responsibilities of those who work with computers,
- To discuss technical issues in using computer science and focus on a particular area such as software design, privacy, intellectual property rights , freedom of speech and liability hacking, viruses, computer crime, and employee surveillance.

COURSE OUTCOME:

CO1: Understand the basic concepts of ethics.

CO2: Describe the different methods of applying laws and regulations.

CO3: Analyze IT related ethical problems and to arrive at appropriate decisions

CO4: Apply concepts of computer ethics in organizational settings.

CO5: Deal with practical problems as related to ethical, political and social issues.

CO6: Integrate elements of problem and its solution in different settings.

CO7: Discuss failures of proposed solutions to different problem situations.

CO8: Discuss designing and developing code of ethics.

UNIT 1:

Understand the basic concepts of ethics. Contribution of ethics in security and privacy of IS. Technology used in the security of IS and regulations related to its implementation. Different methods of applying laws and regulations.

UNIT 2:

Ideas appropriate for analysis and problem solving. Theoretical build up of parts of ethics needed for an organizational IS. Analyse IT related ethical problems and to arrive at appropriate decisions. Concepts of computer ethics in organizational settings.

UNIT 3:

Practical problems as related to ethical, political and social issues. Integrate elements of problem and its solution in different settings. Failures of proposed solutions to different problem situations.

UNIT 4:

Competencies of technical and operations management related to ethical, Political and social issues. Designing and developing code of ethics. Ways of arriving at solutions related to IT ethical problems. Discussions and evaluate success and failure of solutions and cases

TEXT BOOKS:

Baase, Sara ,A Gift of Fire: Social, Legal, and Ethical Issues for Computing and the Internet, 4th ed, Prentice-Hall, ISBN: 0130082155

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II M.Sc. Computer Science **Semester-III**

Data Visualization Tools (Skill Oriented Course)

COURSE OBJECTIVES:

- To introduce visual perception and core skills for visual analysis
- To understand visualization for time-series analysis and ranking analysis
- To understand visualization for deviation analysis
- To understand visualization for distribution analysis and correlation analysis
- To understand visualization for multivariate analysis
- To understand issues and best practices in information dashboard design

COURSE OUTCOME:

CO1: Understand different analysis with visualization.

CO2: Ability to use the tools for data visualization.

UNIT I

CORE SKILLS FOR VISUAL ANALYSIS: Information visualization - effective data analysis- traits of meaningful data - visual perception - making abstract data visible - building blocks of information visualization - analytical interaction - analytical navigation - optimal quantitative scales - reference lines and regions - trellises and crosstabs - multiple concurrent views - focus and context - details on demand - over-plotting reduction - analytical patterns – pattern examples

UNIT II

TIME-SERIES, RANKING, AND DEVIATION ANALYSIS: Time-series analysis - time-series patterns - time-series displays - time-series best practices- part-to-whole and ranking patterns - part-to-whole and ranking displays - best practices - deviation analysis - deviation analysis displays - deviation analysis best practices

UNIT III

DISTRIBUTION, CORRELATION: Distribution analysis - describing distributions - distribution patterns - distribution displays - distribution analysis best practices - correlation analysis - describing correlations – correlation patterns - correlation displays - correlation analysis techniques and best practices

UNIT IV

MULTIVARIATE ANALYSIS: Multivariate analysis - multivariate patterns - multivariate displays - multivariate analysis techniques and best practices

TEXT BOOK:

1. Stephen Few, Now you see it: Simple Visualization techniques for quantitative analysis, Analytics Press, 2009.
2. Stephen Few, Information Dashboard Design: The effective visual communication of data, O'Reilly, 2006.
3. Edward R. Tufte, The visual display of quantitative information, Second Edition, Graphics Press, 2001.

REFERENCE BOOKS:

1. Nathan Yau, Data Points: Visualization that means something, Wiley, 2013.
2. Ben Fry, Visualizing data: Exploring and explaining data with the processing environment, O'Reilly, 2008.
3. Gert H. N. Laursen and Jesper Thorlund, Business Analytics for Managers: Taking business intelligence beyond reporting, Wiley, 2010.
4. Evan Stubbs, The value of business analytics: Identifying the path to profitability, Wiley, 2011.

II M.Sc. Computer Science

Semester-IV

CLOUD COMPUTING

COURSE OBJECTIVES:

- To introduce the broad perspective of cloud architecture and model
- To understand the concept of Virtualization and design of cloud Services
- To understand the infrastructure of cloud
- To apply different cloud programming model as per need.
- To understand the concepts of high-performance computing in cloud

COURSE OUTCOME:

CO1: Compare the strengths and limitations of cloud computing

CO2: Identify the architecture, infrastructure and delivery models of cloud computing

CO3: Apply suitable virtualization concept.

CO4: Understand the infrastructure of cloud.

CO5: Address the core issues of cloud computing such as security, privacy and interoperability.

UNIT-I:

Introduction: Cloud models-Evolution of Cloud Computing –System Models for Distributed and Cloud Computing – NIST Cloud Computing Reference Architecture – On-demand Provisioning – Elasticity in Cloud – deployment models – service models-cloud service providers **Virtualization:** Basics of Virtualization - Types of Virtualization - Implementation Levels of Virtualization -Virtualization Structures - Tools and Mechanisms – resource sharing and resource pooling - Desktop Virtualization – Server Virtualization.

UNIT-II:

Cloud Infrastructure: Architectural Design of Compute and Storage Clouds – Layered Cloud Architecture Development– Design Challenges - Inter Cloud Resource Management – Resource Provisioning and Platform Deployment – Global Exchange of Cloud Resources.

UNIT-III:

Programming Model: Parallel and Distributed Programming Paradigms – Map Reduce, Twister and Iterative Map Reduce – Hadoop Library from Apache – Mapping Applications - Programming Support. **Security in the Cloud:** Security Overview – Cloud Security Challenges – Access control mechanisms – Security Governance – Risk Management – Security Monitoring – Security Architecture Design – Virtual Machine Security.

UNIT-IV:

Enterprise Cloud-Based High-Performance Computing (HPC):

Overview of High Performance Computing (HPC) on Cloud-Enterprises HPC applications (High-performance grid computing, high-performance big data computing/analytics, high performance reasoning)-HPC Cloud vendor solutions: compute grids (Windows HPC, Hadoop, Platform Symphony ,Gridgain), data grids (Oracle coherence, IBM Object grid, Cassandra, HBase, Memcached, HPChardware (GPGPU, SSD, Infiniband, Non-blocking switches)

Text Book

1. Kai Hwang, Geoffrey C Fox, Jack G Dongarra, Distributed and Cloud Computing, FromParallelProcessing to the Internet of Things, 2012, 1st Edition, Morgan Kaufmann Publishers.

Reference Books

1. Katarina Stanoevska-Slabeva, Thomas Wozniak, SantiRistol, Grid and Cloud Computing – A Business Perspective on Technology and Applications, 2010, Springer.
2. John W. Rittinghouse and James F. Ransome, Cloud Computing: Implementation, Management, and Security”, 2010, CRC Press.
3. Toby Velte, Anthony Velte, Robert Elsenpeter, Cloud Computing, A Practical Approach, 2009, TMH.
4. George Reese, Cloud Application Architectures: Building Applications and Infrastructure in the Cloud O'Reilly, 2009.

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G. Rajkumar.

II M.Sc. Computer Science **Semester-IV**

Artificial Intelligence and Machine Learning

COURSE OBJECTIVES:

- To understand the concepts of machine learning.
- To appreciate supervised and unsupervised learning and their applications.
- To appreciate the concepts and algorithms of learning.
- To understand the basic theory underlying machine learning.
- To be able to formulate machine learning problems corresponding to different applications.
- To understand a range of machine learning algorithms along with their strengths and weaknesses.
- To be able to apply machine learning algorithms to solve problems of moderate complexity.

COURSE OUTCOME:

CO1: Understand different learning processes and their applications.

CO2: Ability to explore logic for solving various AI problems

CO3: Ability to understand what is learning and why it is essential to the design of intelligent machines.

CO4: Ability to design and implement various machine learning algorithms in a wide range of real-world applications.

UNIT-I:

Artificial Intelligence: Introduction, history, intelligent systems, foundations of AI, Applications, current trends in AI, tic-tac-tie game playing.

Problem solving: Introduction, state - space search, general problem solving, characteristics of problem, control strategies - exhaustive searches, heuristic search techniques, BFS, a* search, iterative-deepening a*, constraint satisfaction problems.

UNIT-II:

Problem reduction and game playing: Introduction, problem reduction, AO* search, game playing - Min Max algorithm, alpha beta pruning.

Knowledge representation: Introduction, approaches to knowledge representation, knowledge representation using semantic network, extended semantic networks for KR, knowledge representation using frames.

UNIT-III:

Machine Learning: A brief introduction to Machine Learning, Supervised Learning, Unsupervised Learning, Reinforcement Learning. Supervised Learning: Classification and Regression, Different ways to Combine Classifiers.

Unsupervised Learning: Clustering and Association, Nearest Neighbor Methods, K means Algorithms, Gaussian Mixture Models, SVM concepts, Decision Trees, Constructing Decision Trees, Ensemble Learning, Boosting, Bagging, Stacking. Reinforcement Learning: Overview, Q learning, Dynamic programming.

UNIT-IV:

Artificial neural networks: Introduction, artificial networks, single layer feed forward networks, multi layered forward networks and Back Propagation Algorithms, design issues of artificial neural networks.

Multi-layer Perceptron: Overview, Interpolations and Basis Functions, Radial Basis Functions and Spline, RBF Network, Curse of Dimensionality.

Text Books:

1. Artificial Intelligence- Saroj Kaushik, CENGAGE Learning.
2. Artificial intelligence, A modern Approach, 2nd ed, Stuart Russel, Peter Norvig, PEA
3. Artificial Intelligence- 3rd ed, Rich, Kevin Knight, Shiv Shankar B Nair, TMH
4. Introduction to Artificial Intelligence, Patterson, PHI
5. Machine Learning -Tom M. Mitchell, -MGH
6. Machine Learning: An Algorithmic Perspective, Stephen Marsland, Taylor & Francis

II M.Sc. Computer Science
Semester-IV
INTERNET OF THINGS

COURSE OBJECTIVES:

- To understand IoT Market perspective.
- To understand State of the Art – IoT Architecture.
- To understand Real World IoT Design Constraints, Industrial Automation and Commercial Building Automation in IoT.

COURSE OUTCOME:

CO1: Understand the architecture of IoT

CO2: Ability to develop small applications using IoT

UNIT-I:

Introduction to IoT:

An Overview of Internet of things, Physical Design of IoT, Logical Design of IoT, IoT Enabling Technologies. M2M Communication, Examples of IoTs, Difference between IoT and M2M, SDN and NFV for IoT. Design Principles for Connected Devices Internet Connectivity Principles, Internet connectivity, Application Layer Protocols: HTTP, HTTPS, FTP, Telnet.

UNIT-II:

Business Models for Business Processes in the Internet of Things, IoT/M2M systems LAYERS AND designs standardizations, Modified OSI Stack for the IoT/M2M Systems, ETSI M2M domains and High-level capabilities, Communication Technologies, Data Enrichment and Consolidation and Device Management Gateway Ease of designing and affordability

UNIT-III:

Design Principles for the Web Connectivity for connected-Devices, Web Communication Protocols for Connected Devices, Message Communication protocols for Connected Devices, Web Connectivity for connected Devices. Data Acquiring, Organizing and Analytics in IoT/M2M, Applications /Services /Business Processes, IOT/M2M Data Acquiring and Storage, Business Models for Business Processes in the Internet of Things, Organizing Data, Transactions, Business Processes, Integration and Enterprise Systems.

UNIT-IV:

Data Collection, Storage and Computing Using a Cloud Platform for IoT/M2M Applications/Services, Data Collection, Storage and Computing Using cloud platform Everything as a service and Cloud Service Models, IOT cloud-based services using the Xively (Pachube/COSM), Nimbits and other platforms Sensor, Participatory Sensing, Actuator, Radio Frequency Identification, and Wireless, Sensor Network Technology, Sensors Technology, Sensing the World.

Text Books:

1. Internet of Things: Architecture, Design Principles and Applications, Rajkamal, McGraw Hill Higher Education
2. Internet of Things, A. Bahgya and V. Madiseti, Univesity Press, 2015

Reference Books:

1. Designing the Internet of Things, Adrian McEwen and Hakim Cassimally, Wiley
2. Getting Started with the Internet of Things Cuno Pfister, Oreil

II M.Sc. Computer Science
Semester-IV
SOFTWARE PROJECT MANAGEMENT

COURSE OBJECTIVES:

- To know process of project planning for different software process.
- To learn cost estimation techniques during the analysis of the project.
- To understand quality concepts for ensuring the functionality of the software

COURSE OUTCOME:

CO1: Understand the activities during project scheduling of software application.

CO2: Learn risk management activities and resource allocation for the projects.

CO3: Applying the software estimation and recent quality standards for evaluation of software projects

CO4: Acquire knowledge and skills needed for the construction of highly reliable software project

CO5: Able to create reliable, replicable cost estimation that links to the requirements of project planning and managing.

UNIT I

Conventional Software Management: The waterfall model, conventional software Management performance.

Evolution of Software Economics: Software Economics, pragmatic software cost estimation.

Improving Software Economics: Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections.

The old way and the new: The principles of conventional software Engineering, principles of modern software management, transitioning to an iterative process.

UNIT II

Life cycle phases: Engineering and production stages, inception, Elaboration, construction, transition phases.

Artifacts of the process: The artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts.

Model based software architectures: A Management perspective and technical perspective.

Work Flows of the process: Software process workflows, Iteration workflows,

UNIT III

Checkpoints of the process: Major mile stones, Minor Milestones, Periodic status assessments.

Iterative Process Planning: Work breakdown structures, planning guidelines, cost and schedule estimating, Iteration planning process, Pragmatic planning.

Project Organizations and Responsibilities: Line-of-Business Organizations, Project Organizations, evolution of Organizations.

Process Automation: Automation Building blocks, The Project Environment.

UNIT –IV

Project Control and Process instrumentation: The seven core Metrics, Management indicators, quality indicators, life cycle expectations, pragmatic Software Metrics, Metrics automation.

Tailoring the Process: Process discriminants.

Future Software Project Management: Modern Project Profiles, Next generation Software economics, modern process transitions.

Text Books:

1. Software Project Management, Walker Royce: Pearson Education, 2005.

Reference Books:

1. Software Project Management, Bob Hughes and Mike Cotterell: Tata McGraw- Hill Edition.
2. Software Project Management, Joel Henry, Pearson Education.
3. Software Project Management in practice, PankajJalote, Pearson Education.2005.

Prof
Arava
Pst
G. Raju.

CSSR & SRRM DEGREE & PG COLLEGE (A)
Kamalapuram
II YEAR III SEMESTER MODEL PAPER
COMPUTER ETHICS

Time: 3 Hours

Max Marks:75

Section-A

I. Answer any FIVE questions

(5 X 3= 15M)

1. What is effective data analysis
2. Write about over-plotting reduction
3. Define the Time-series analysis
4. Write about deviation analysis best practices
5. Explain Distribution analysis
6. Write about correlation displays
7. multivariate displays
8. Explain Multivariate analysis

Section-B

II. Answer any FIVE question

(4X 15= 60M)

9. Explain about building blocks of information visualization
(OR)

10. Write about multiple concurrent views

11. Explain about whole and ranking displays
(OR)

12. Explain about deviation analysis displays

13. Explain about distribution analysis best practices.
(OR)

14. Explain correlation analysis techniques and best practices

15. Explain multivariate patterns

(OR)

16. Write about multivariate analysis techniques and best practices

Prof
Aruna
PS
G. Rajkumar

CSSR & SRRM DEGREE & PG COLLEGE (A)
Kamalapuram
II YEAR III SEMESTER MODEL PAPER
CRYPTOGRAPHY AND NETWORK SECURITY
COURES CODE

Time: 3 Hours

Max Marks:75

Section-A

I. Answer any FIVE questions

(5 X 3= 15M)

1. Write about Security trends
2. Explain data encryption standard
3. Explain about Principles of public key cryptosystems
4. Write about Hash functions.
5. Explain Kerbores.
6. Write about Pretty good privacy.
7. Explain Intrusion detection.

8. Explain Trusted systems.

Section-B

II. Answer any FIVE question

(4X 15= 60M)

9. Explain about of advanced symmetric block ciphers.
(OR)
10. Write about Model for Network Security.

11. Explain about Diffie-Hellmen key exchange.
(OR)
12. Explain about security of hash functions and Macs.
13. Explain about 509 directory authentication service.
(OR)
14. Define Pretty good privacy.
15. Write about Password management.
(OR)
16. Explain the Virus counter measures.

CSSR & SRRM DEGREE & PG COLLEGE (A)
Kamalapuram
II YEAR III SEMESTER MODEL PAPER
Python Programming

Time: 3 Hours

Max Marks:75

Section-A

I. Answer any FIVE questions

(5 X 3= 15M)

1. Explain Python Features.
2. Write about Strings.
3. Explain about OOPs Concepts.
4. What is method overloading?
5. Define Python Tkinter (GUI).
6. Write about Message Box.
7. Explain about Database Connection.
8. Write about Join Operations.

Section-B

II. Answer any FIVE question

(4X 15= 60M)

9. Explain about For Loop & While Loop.

(OR)

10. Write about Built-in class attributes.

11. What is inheritance? Types of inheritances (OR)

12. Explain about Data abstraction in python.

13. Explain about Menu button, Menu, Message?

(OR)

14. Define Radio button, Scale, Scrollbar.

15. Write about Environment Setup.

(OR)

16. Explain the Read Operations & Update Operations.

Py
Answer
PT
G. Rajkumar

CSSR & SRRM DEGREE & PG COLLEGE (A)
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II YEAR III SEMESTER MODEL PAPER
BIG DATA ANALYTICS

Time: 3 Hours

Max Marks:75

Section-A

I. Answer any FIVE questions (5 X 3= 15M)

1. Write about Big Data-definition
2. why is Big Data Important?
3. Explain about Understanding MapReduce
4. Write about Hadoop Pipes.
5. Explain Components of Hadoop
6. Write about Hadoop File system.
7. How to Getting the patent data set.
8. Explain creating a Bloom filter.

Section-B

II. Answer any FIVE question (4X 15= 60M)

9. Explain about Characteristics of Big Data.

(OR)

10. Write about Patterns for Big Data Development

11. Explain The building blocks of Hadoop

(OR)

12. Explain about JobTracker and Task Tracker.

13. Explain about Working with files in HDFS

(OR)

14. Define Parallel Copying with distcp

15. Write about constructing the basic template of a MapReduce program

(OR)

16. Explain the Chaining MapReduce jobs

Prof
Aravind
PT
G. Rajkumar

CSSR & SRRM DEGREE & PG COLLEGE (A)
Kamalapuram
II YEAR III SEMESTER MODEL PAPER
DATA VISUALIZATION TOOLS
(Skill Oriented Course Theory)

Time: 3 Hours

Max Marks: 40

Answer ALL questions.
Each question carries 10 marks.

(4 x 10 = 40)

1. Discuss the role of visual perception in data analysis.
Or
2. Explain the fundamentals building blocks of information visualisation.
3. Describe the different time-series patterns and their significance in data visualisation.
Or
4. Describe the best practices for visualising time-series data.
5. Explain different statistical measures used to describe distribution.
Or
6. Describe the various correlation analysis techniques used in data visualisation.
7. Describe different types of multivariate patterns that can be encountered in data analysis.
Or
8. Discuss the challenges associated with visualising multivariate data.

Prof
Aravind
PhD
G. Rajkumar

CSSR & SRRM DEGREE & PG COLLEGE (A)
Kamalapuram
II YEAR IV SEMESTER MODEL PAPER
Software Project Management

Time: 3 Hours

Max Marks:75

Section-A

I. Answer any FIVE questions

(5 X 3= 15M)

1. Explain the waterfall model.
2. Write principles of modern software management.
3. Define the artifact sets.
4. Write about Engineering and production stages.
5. Explain Major mile stones.
6. Write about Major mile stones.
7. The seven core Metrics
8. Explain Process discriminants.

Section-B


II. Answer any FIVE question

(4X 15= 60M)

9. Explain about pragmatic software cost estimation
(OR)
10. Write about improving software processes

11. Explain about Engineering and production stages.
(OR)
12. Explain about Software process workflows.
13. Explain about Automation Building blocks,
(OR)
14. Explain Work breakdown structures

15. Explain Management indicators
(OR)
16. Write about modern process transitions.


Arun
P. S.
G. Rajkumar.

CSSR & SRRM DEGREE & PG COLLEGE (A)
Kamalapuram
II YEAR IV SEMESTER MODEL PAPER
Internet of Things

Time: 3 Hours

Max Marks:75

Section-A

- I. Answer any FIVE questions (5 X 3= 15M)
1. Write about Physical Design of IoT
 2. Write about Decision Tree learning
 3. Modified OSI Stack for the IoT/M2M Systems
 4. Write about Communication Technologies
 5. Explain Web Communication Protocols for Connected Devices
 6. Write about Integration and Enterprise Systems.
 7. Explain Data Collection- M2M
 8. Explain Sensor Network Technology

Section-B

- II. Answer any FIVE question (4X 15= 60M)
9. Explain about Application Layer Protocols: HTTP, HTTPS, FTP, Telnet.
(OR)
 10. Write about Difference between IoT and M2M
 11. Explain about ETSI M2M domains and High-level capabilities
(OR)
 12. Explain about Data Enrichment and Consolidation and Device Management Gateway Ease of designing and affordability
 13. Explain about Organizing and Analytics in IoT/M2M
(OR)
 14. Explain Business Models for Business Processes in the Internet of Things
 15. Explain Storage and Computing Using a Cloud Platform for IoT/M2M Applications/Services.
(OR)
 16. Write about IOT cloud-based services using the Xively (Pachube/COSM).

Prof
Aravind
PSK
G. Rajkumar

CSSR & SRRM DEGREE & PG COLLEGE (A)

Kamalapuram

II YEAR IV SEMESTER MODEL PAPER

Cloud Computing

Time: 3 Hours

Max Marks:75

Section-A

I. Answer any FIVE questions

(5 X 3= 15M)

1. Evolution of Cloud Computing
2. Write about Server Virtualization.
3. Define the Design Challenges
4. Write about Global Exchange of Cloud Resources
5. Explain Map Reduce
6. Write about Virtual Machine Security.
7. data grids -Oracle coherence.
8. Explain Non-blocking switches

Section-B

II. Answer any FIVE question

(4X 15= 60M)

9. Explain about System Models for Distributed and Cloud Computing
(OR)
10. Write about Types of Virtualization
11. Explain about Architectural Design of Compute and Storage Clouds
(OR)
12. Explain about Inter Cloud Resource Management
13. Explain about Security Overview- Security in the Cloud
(OR)
14. Explain Risk Management
15. Explain Overview of High Performance Computing (HPC) on Cloud
(OR)
16. Write about HPC Cloud vendor solutions

Prof
Arun
P.S.
G. Rajkumar

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II YEAR IV SEMESTER MODEL PAPER
Artificial Intelligence and Machine Learning

Time: 3 Hours

Max Marks:75

Section-A

I. Answer any FIVE questions

(5 X 3= 15M)

1. Explain history of Artificial Intelligence
2. Write about general problem solving
3. Define problem reduction
4. Write about approaches to knowledge representation
5. Explain Supervised Learning
6. Write about Dynamic programming.
7. Explain artificial networks
8. Explain Curse of Dimensionality

Section-B

II. Answer any FIVE question

(4X 15= 60M)

9. Explain about foundations of AI

(OR)

10. Write about constraint satisfaction problems.

11. Explain about game playing - Min Max algorithm.

(OR)

12. Explain about knowledge representation using frames.

13. Explain about Different ways to Combine Classifiers.

(OR)

14. Explain SVM concepts

15. Explain multi layered forward networks and Back Propagation Algorithms

(OR)

16. Write about Radial Basis Functions and Spline

Pictures & Attendance Sheet

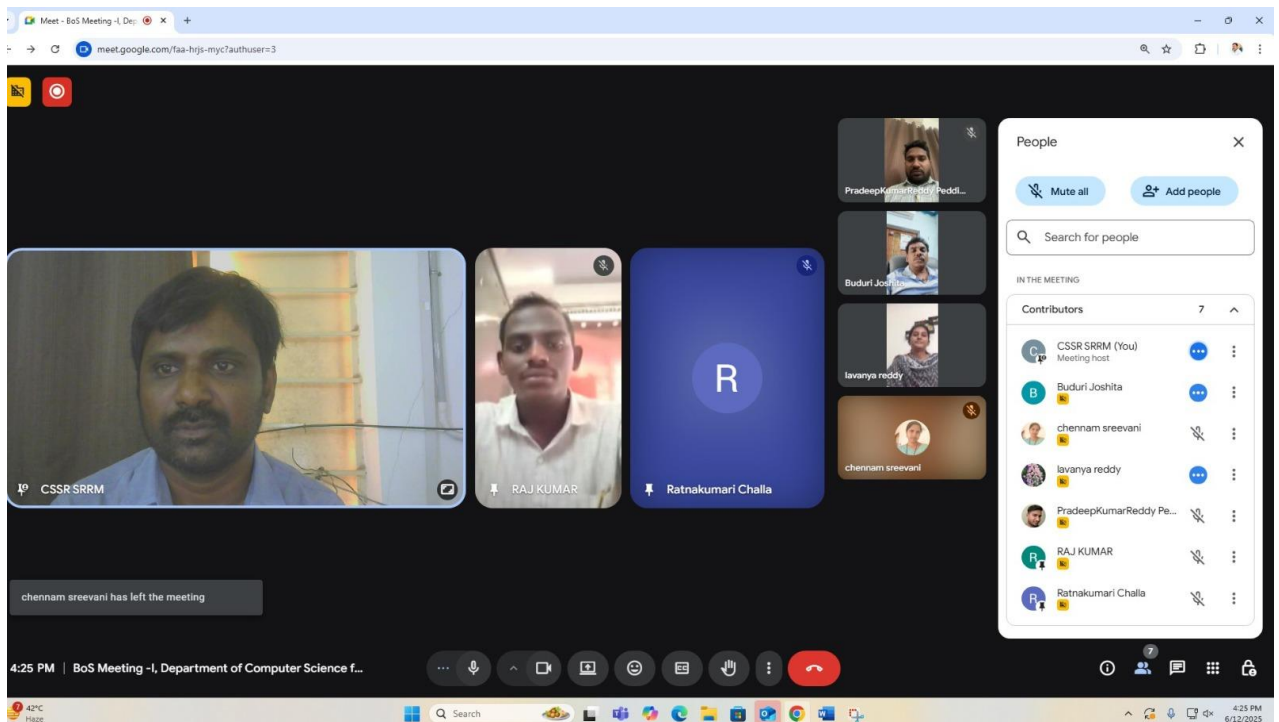
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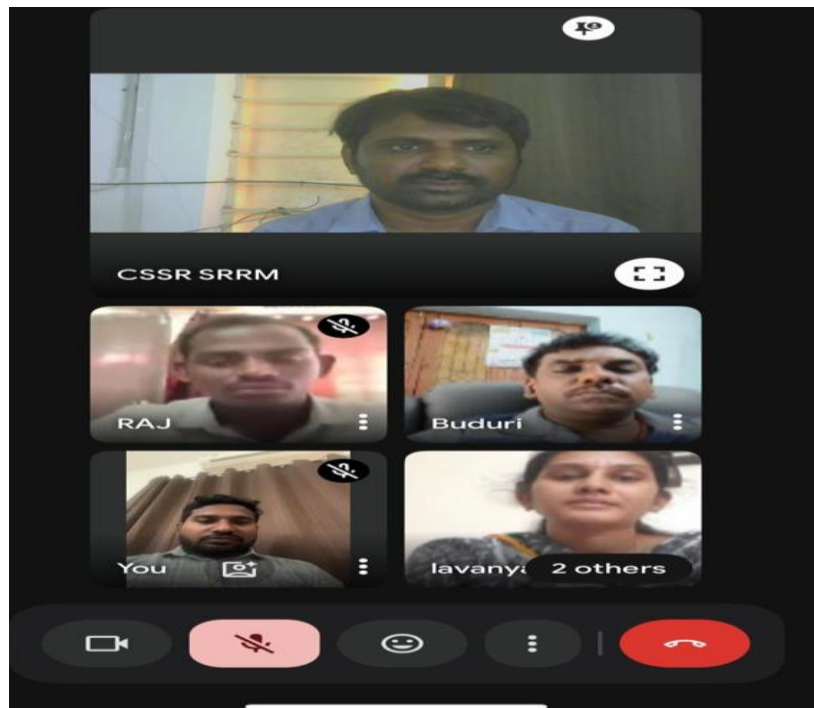
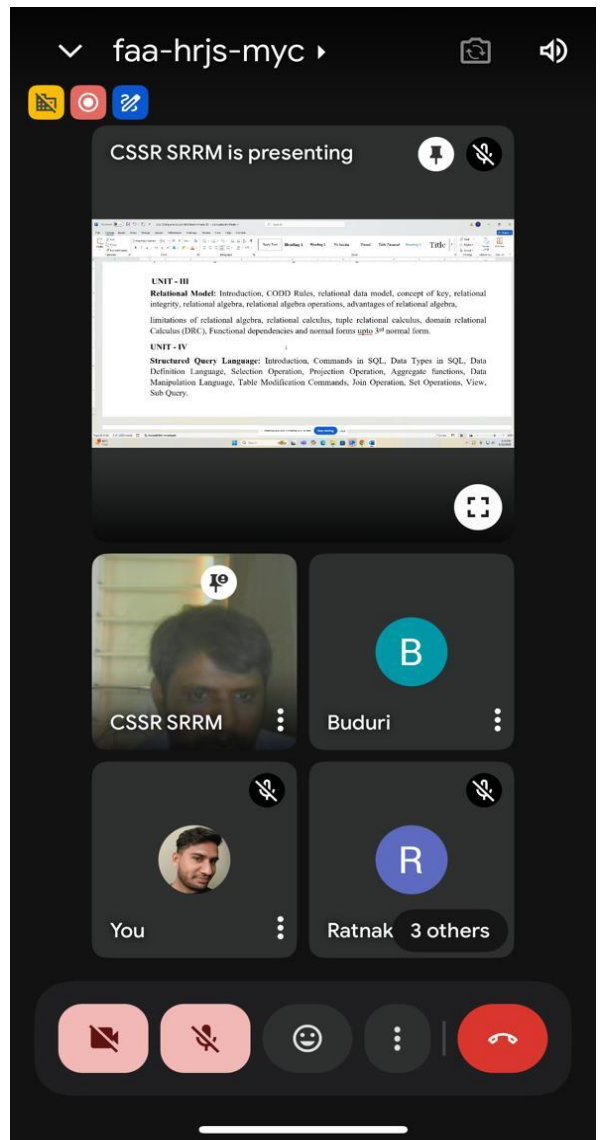
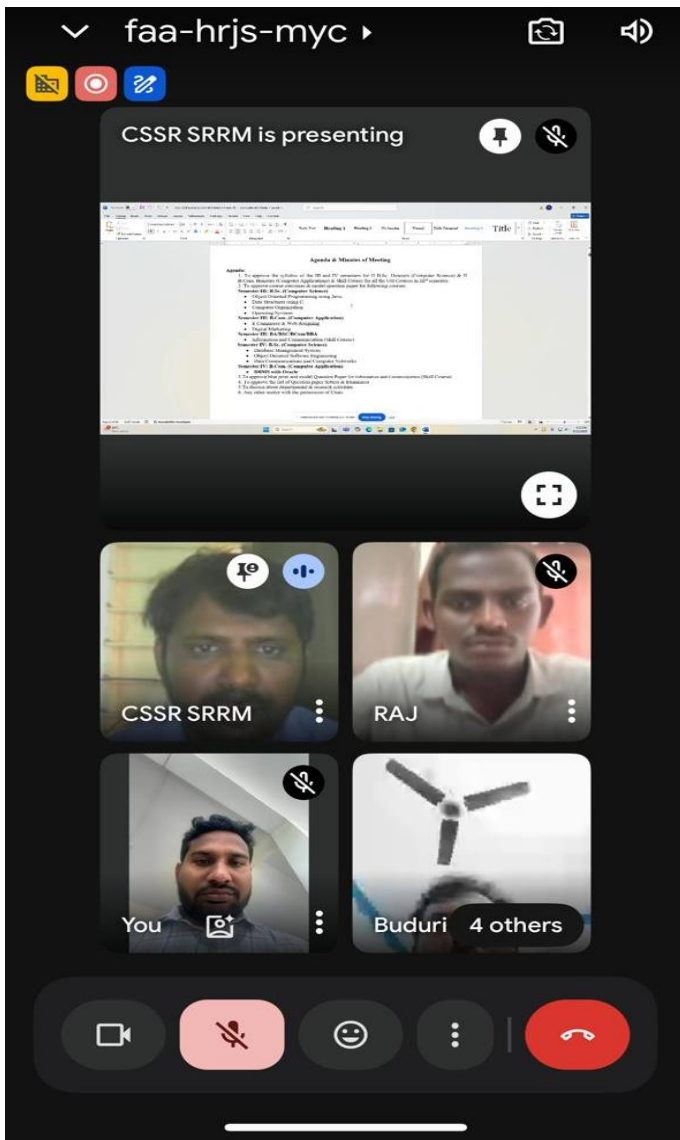
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Attendance Sheet:

	A	B	C	D	E	F	G
1	First name	Last name	Email	Duration	Time joined	Time exited	
2	Ratnakumari	Challa	ratn*****@***.com	57 min	3:28 PM	4:25 PM	
3	Buduri	Joshita	bred*****@***.com	1 hr 32 min	2:53 PM	4:25 PM	
4	RAJ	KUMAR	gong*****@***.com	1 hr 33 min	2:53 PM	4:25 PM	
5	PradeepKumarReddy	PeddiReddy	prad*****@***.com	1 hr 34 min	2:51 PM	4:25 PM	
6	lavanya	reddy	lava*****@***.com	1 hr 27 min	2:58 PM	4:25 PM	
7	LOKESWARA	REDDY	loke*****@***.com	1 hr 16 min	2:51 PM	4:13 PM	
8	Cssrcomputer	science&applications	cssr****@***.com	23 min	3:01 PM	3:25 PM	
9	chennam	sreevani	chen*****@***.com	1 hr 14 min	2:58 PM	4:25 PM	
10	CSSR	SRRM	admin@cssrandsrrmdc.ac.in	1 hr 35 min	2:51 PM	4:25 PM	
11							
12							


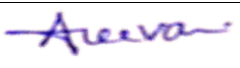

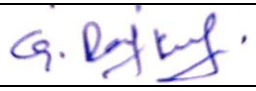
Pictures:





Prof
 Arava
 P. S.
 G. Raju.

Attendance Sheet

Sl. No.	Category	Name	Designation	Signature
1	In charge of the Department	K. Sreenivas Reddy	Head, Department of Computer Science & Applications	
2	Faculty Member	I.Sreevani	Lecturer	
3	Faculty Member	P. Pradeep Kumar Reddy	Lecturer	
4	Faculty Member	G. Raj Kumar	Lecturer	
5	Two experts from Outside the Parent University nominated by Academic Council	Dr. Ch.Ratna Kumari Assistant Professor RGUKT-Andhra Pradesh Ph: 9441603196 Email: ratnamala3784@gmail.com	Assistant Professor	Online Attended
		N. Lavanya Department of Computer Science Sri Venkateswara Degree & PG College, Ananthapuram Ph: 9494931000	Lecturer	Online Attended
6	One Expert Nominated by Vice Chancellor	Dr.B. Reddiaah Department of Computer Science & Technology Yogi Vemana University, Kadapa Ph:9000601602 Email: b.reddaiiah@yvu.edu.in	Associate Professor	Online Attended
7	One representative from Industry/ Corporate allied areas nominated by the Principal	G. Vinay Kumar, Jyothi & Company, Mandy Complex, Proddatur, YSR Ph:9246942311	Industrialist	Absent
8	Alumni nominated by the Principal	Y.C. Lokeswara Reddy, M.Sc. (Computer Science) Ph:9652262519	Alumni	Online Attended

