M.C.A. – Master of Computer Applications

CURRICULUM & SYLLABI

Regulations 2018

(Applicable to candidates admitted in the academic year 2018-2019 onwards)

K.S.R. College of Engineering

(Autonomous)
K.S.R. Kalvi Nagar, Tiruchengode – 637 215
Namakkal (Dt), Tamilnadu, India
Email : info@ksrce.ac.in Website : www.ksrce.ac.in

		K.S.R. COLLEGE OF ENGINEERING (Autonomous) (Approved by AICTE & Affiliated to Anna University) K.S.R. Kalvi Nagar, Tiruchengode - 637 215						CURRICULUM PG R - 2018		
Department		Computer Applications								
Programme		Master of Computer Applications								

SEMESTER - I

SI.No.	Course Code	Course Name	Category	Hours/ Week			Credit	Maximum Marks		
				L	T	P	C	CA	ES	Total
THEORY										
01	BA18131	Accounting and Financial Management	FC	3	2	0	3	30	70	100
02	CA18112	Digital Fundamentals and Computer Organization	PC	3	2	0	3	30	70	100
03	CA18113	Data Structures	PC	3	0	0	3	30	70	100
04	CA18114	Database Management Systems	PC	3	0	0	3	30	70	100
05	CA18115	Problem Solving Using 'C'	PC	3	0	0	3	30	70	100
PRACTICAL										
06	CA18121	Data Structures Lab	PC	0	0	3	2	50	50	100
07	CA18122	Database Management Systems Lab	PC	0	0	3	2	50	50	100
08	CA18123	C Programming Lab	PC	0	0	3	2	50	50	100
		Total		15	4	9	21		800	

SEMESTER - II

SI.No.	Course Code	Course Name	Category	Hours/ Week			Credit	Maximum Marks		
				L	T	P	C	CA	ES	Total
THEORY										
01	CA18211	Operating Systems	PC	3	0	0	3	30	70	100
02	CA18212	Design and Analysis of Algorithms	PC	3	0	0	3	30	70	100
03	MA18233	Discrete Mathematics	FC	3	0	0	3	30	70	100
04	EC18234	Microprocessor and its Applications	FC	3	2	0	4	30	70	100
05	CA18215	Object Oriented Programming Using C++	PC	3	0	0	3	30	70	100
PRACTICAL										
06	CA18221	Algorithms Lab	PC	0	0	3	2	50	50	100
07	EC18252	Microprocessor and Microcontroller Laboratory	FC	0	0	3	2	50	50	100
08	CA18223	Object Oriented Programming Lab	PC	0	0	3	2	50	50	100
		Total		15	2	9	22		800	

	K.S.R. COLLEGE OF ENGINEERING (Autonomous) (Approved by AICTE & Affiliated to Anna University) K.S.R. Kalvi Nagar, Tiruchengode - 637 215	CURRICULUM PG R - 2018

Department	Computer Applications
Programme	Master of Computer Applications

SEMESTER - III

SI.No.	Course Code	Course Name	Category	Hours/ Week			Credit	Maximum Marks		
				L	T	P	C	CA	ES	Total
THEORY										
01	CA18311	Data Communication and Networks	PC	3	0	0	3	30	70	100
02	CA18312	Software Engineering	PC	3	2	0	3	30	70	100
03	CA18313	Java Programming	PC	3	0	0	3	30	70	100
04	CA18314	Computer Graphics and Multimedia	PC	3	2	0	3	30	70	100
05	CA18315	Information and Network Security	PC	3	0	0	3	30	70	100
PRACTICAL										
06.	CA18321	Networks Lab	PC	0	0	3	2	50	50	100
07.	CA18322	Java Programming Lab	PC	0	0	3	2	50	50	100
08.	CA18323	Computer Graphics and Multimedia Lab	PC	0	0	3	2	50	50	100
09.	HR18041	Career Building Skills I	EEC	0	2	0	0	50	50	100
		Total		15	6	9	21		900	

SEMESTER - IV

SI.No.	Course Code	Course Name	Category	Hours/ Week			Credit	Maximum Marks		
				L	T	P	C	CA	ES	Total
THEORY										
01	CA18411	C# and .NET	PC	3	2	0	3	30	70	100
02	CA18412	Object Oriented Analysis and Design	PC	3	2	0	3	30	70	100
03	CA18413	Web Technology	PC	3	0	0	3	30	70	100
04		Elective I	PE	3	0	0	3	30	70	100
05		Elective II	PE	3	0	0	3	30	70	100
PRACTICAL										
06.	CA18421	C# and .Net Lab	PC	0	0	3	2	50	50	100
07.	CA18422	Web Technology Lab	PC	0	0	3	2	50	50	100
08.	CA18423	Case Tools Lab	PC	0	0	3	2	50	50	100
09.	HR18042	Career Building Skills II	EEC	0	2	0	0	50	50	100
		Total		15	6	9	21		900	

		K.S.R. COLLEGE OF ENGINEERING (Autonomous) (Approved by AICTE & Affiliated to Anna University) K.S.R. Kalvi Nagar, Tiruchengode - 637 215						CURRICULUM PG R - 2018		
Department		Computer Applications									
Programme		Master of Computer Applications									
SEMESTER - V											
Sl.No.	Course Code	Course Name	Category	L	T	P	C	CA	ES	Total	
THEORY											
01	CA18511	Cloud Computing	PC	3	2	0	3	30	70	100	
02	CA18512	Software Testing & Quality Assurance	PC	3	0	0	3	30	70	100	
03	CA18513	Mobile Application Development	PC	3	2	0	4	30	70	100	
04	CA18514	Open Source Software	PC	3	0	0	3	30	70	100	
05		Elective III	PC	3	0	0	3	30	70	100	
PRACTICAL											
06.	CA18521	Software Testing Lab	PC	0	0	3	2	50	50	100	
07.	CA18522	Open Source Software Lab	PC	0	0	3	2	50	50	100	
08.	CA18523	Mobile Application Development Lab	PC	0	0	3	2	50	50	100	
Total				15	4	9	22		800		

SEMESTER - VI										
Sl.No.	Course Code	Course Name	Category	L	T	P	C	CA	ES	Total
THEORY										
PRACTICAL										
01.	CA18621	Project work	EEC	0	0	24	12	50	50	100
Total				0	0	24	12		100	

K.S.R. COLLEGE OF ENGINEERING (Autonomous) (Approved by AICTE & Affiliated to Anna University) K.S.R. Kalvi Nagar, Tiruchengode - 637 215		CURRICULUM PG R - 2018
Department	Computer Applications	
Programme	Master of Computer Applications	

List of Electives

ELECTIVE - I (SEMESTER - IV)

Sl.No.	Course Code	Course Name	Category	Hours/ Week			Credit	Maximum Marks		
				L	T	P	C	CA	ES	Total
01	MA18461	Operations Research	PE	3	0	0	3	30	70	100
02	CA18462	TCP/IP	PE	3	0	0	3	30	70	100
03	CA18463	Unix and Network Programming	PE	3	0	0	3	30	70	100
04	CA18464	Data Science & Big Data Technology	PE	3	0	0	3	30	70	100
05	CA18465	Middleware Technology	PE	3	0	0	3	30	70	100
06	CA18466	Supply Chain Management	PE	3	0	0	3	30	70	100

ELECTIVE - II (SEMESTER - IV)

Sl.No.	Course Code	Course Name	Category	Hours/ Week			Credit	Maximum Marks		
				L	T	P	C	CA	ES	Total
01	MA18467	Numerical Methods	PE	3	0	0	3	30	70	100
02	CA18468	Software Project Management	PE	3	0	0	3	30	70	100
03	CA18469	Advanced Operating Systems	PE	3	0	0	3	30	70	100
04	CA18470	E-Learning Techniques	PE	3	0	0	3	30	70	100
05	CA18471	Soft Computing	PE	3	0	0	3	30	70	100
06	CA18472	Digital Image Processing	PE	3	0	0	3	30	70	100
07	CA18473	Mobile Computing	PE	3	0	0	3	30	70	100

ELECTIVE - III (SEMESTER - V)

Sl.No.	Course Code	Course Name	Category	Hours/ Week			Credit	Maximum Marks		
				L	T	P	C	CA	ES	Total
01	CA18581	Linguistic Computing	PE	3	0	0	3	30	70	100
02	CA18582	Advanced Databases	PE	3	0	0	3	30	70	100
03	CA18583	Bio-Informatics	PE	3	0	0	3	30	70	100
04	CA18584	Artificial and Neural Networks	PE	3	0	0	3	30	70	100
05	BA18585	M-Commerce	PE	3	0	0	3	30	70	100
06	BA18586	Organizational Behavior	PE	3	0	0	3	30	70	100
07	BA18587	Health Care Information Systems	PE	3	0	0	3	30	70	100

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018

<u>SEMESTER - I</u>

		L	T	P	C
BA18131	ACCOUNTING AND FINANCIAL MANAGEMENT	3	2	0	3

Objectives:
1. *To learn the accounting principles and preparation of final accounts.*
2. *To know costing and various cost methods.*
3. *To analyze various financial statements.*
4. *To study about budgets and budgetary control*
5. *To gain knowledge in financial management and investment decisions.*

UNIT - I   FINANCIAL ACCOUNTING   [9]
Financial Accounting - Definition - Accounting Principles - Concepts and Conventions - Journalizing Transactions and Ledger Posting - Trial Balance. Final Accounts: Trading Account - Profit and Loss Account - Balance Sheet. Depreciation: Straight Line Method - Written Down Value Method.

UNIT - II   COST ACCOUNTING   [9]
Meaning – Objectives - Elements of Cost – Components - Cost Sheet – Classification – Methods. Marginal Costing and Cost Volume Profit Analysis - Break Even Analysis. Methods of Valuing Material Issue: FIFO – LIFO – Weighted Average Cost Method – Standard Price Method

UNIT - III   FINANCIAL ANALYSIS   [9]
Financial Statement Analysis - Types - Techniques - Ratios Analysis - Classification of Ratios - Funds Flow Analysis: Preparation of Fund Flow Statement - Cash Flow Analysis: Preparation of Cash Flow Statement - Difference Between Fund Flow Analysis and Cash Flow Analysis.

UNIT - IV   BUDGETS AND BUDGETARY CONTROL   [9]
Budgets and Budgetary Control – Meaning – Limitations – Classification - Sales Budget - Production Budget - Cost of Production Budget – Cash Budget – Master Budget – Flexible Budgeting - Zero Base Budgeting.

UNIT - V   FINANCIAL MANAGEMENT   [9]
Introduction – Objectives – Functions – Role of Financial Manager – Investment Decisions: Capital Budgeting – Accounting Rate of Return – Net Present Value - Pay Back Period – Profitability Index – Internal Rate of Return.

Total = 45 Periods

Course Outcomes: On Completion of this course, the student will be able to
1. *Describe the basic concept of accounting principles and balance sheet.*
2. *Identify the methods of valuing material issues and gain the knowledge of financial analysis.*
3. *Describe the various concepts of fund flow analysis and cash flow analysis.*
4. *Express the basic concept of budget and its disadvantages.*
5. *Identify the role of financial manager and gain the knowledge of investment decisions*

Text Book :

1   S.N.Maheswari, "Financial and Management Accounting", Sultan Chand & Sons, 5th Edition, 2010.
2.   M Y Khan, P K Jain, "Financial Management Text, Problems & Cases", 6th edition, TMH, 2011.

Reference Books :

1   N. Ramachandran, Ramkumar Kakani, "Financial Accounting for Management", Second Edition,TMH, 2008.
2   S.N.Maheshwari, "Financial Management Principles and Practice", Sultan Chand & Sons, 2007.

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018

<u>SEMESTER - I</u>

| CA18112 | DIGITAL FUNDAMENTALS AND COMPUTER ORGANIZATION | L 3 | T 2 | P 0 | C 3 |

Prerequisite: Digital Fundamentals

Objectives:
1. *To learn the deep knowledge about digital technologies.*
2. *To know Components and Representation.*
3. *To learn the Register and Micro operations.*
4. *To realize the Computer organization.*
5. *To know the Memory Organization.*

UNIT - I   DIGITAL LOGIC CIRCUITS   [9]
Digital Computers – Logic Gates – Boolean Algebra – Map Simplification –Combinational Circuits–Flip Flops – SR Flip Flop – D Flip Flop – JK Flip Flop – T Flip Flop- Edge Triggered flip flops– Sequential Circuits- Flip flop Input Equations – State Table – State Diagram – Design Example – Design Procedure.

UNIT - II   DIGITAL COMPONENTS AND DATA REPRESENTATION   [9]
Integrated Circuits – Decoders – Multiplexers – Memory unit – Random Access Memory – Read Only Memory – Types of ROMs – Data types – Complements- (r-1)'s Complement – (r's) Complement – Fixed Point Representation – Integer Representation – Arithmetic Addition - Arithmetic Subraction.

UNIT - III   REGISTER TRANSFER AND MICROOPERATIOS   [9]
Register Transfer Language - Register Transfer - Bus and Memory Transfers – Arithmetic micro operations – Binary Adder - Binary Adder Subtractor – Binary Incrementer —Logic Microoperatios – list of Logic Micro operations – Hardware Implementation - Shift Microoperatios.

UNIT - IV   BASIC COMPUTER ORGANIZATION AND DESIGN   [9]
Instruction Codes – Computer Registers - Common Bus System – Computer Instructions-Instruction Set Completeness – Timing and   Control – Instruction Cycle – Memory reference Instructions – AND to AC – ADD to AC – LDA :Load to AC – STA: Store AC – Input Output Interrupt.

UNIT - V   MEMORY ORGANIZATION   [9]
Memory Hierarchy – Main Memory – Auxiliary Memory – Associative Memory – Cache Memory – Associative mapping – Direct Mapping Writing into Cache – Cache Intialization– Virtual Memory – Memory Management Hardware – Segmented Page Mapping – Memory Protection.

                                                                    Total = 45 Periods

Course Outcomes: On Completion of this course, the student will be able to
1. *Gain the knowledge of arithmetic operation.*
2. *Identify the types of combinational circuits.*
3. *Review the concept of interrupts and types of buses.*
4. *Summarize the concept of basic operational concepts and addressing modes.*
5. *Outline types of RAM, ROM memories and secondary storage devices.*

Text Book :

1   M. Morris Mano, "Computer System Architecture" Third Edition PHI Learning 2009.

Reference Books :

1   William Stallings, "Computer Organization and Architecture", Sixth Edition, Pearson Education,2004

2   M. Morris Mano , "Digital Logic & Computer Design" Pearson 2012.

3   David E. Culler, Jaswinder Paul Singh, Anoop Gupta:Parallel Computer Architecture: Hardware / Software Approach, Elsevier Science, 2008.

K.S.R. COLLEGE OF ENGINEERING (Autonomous)　　　　　R 2018

<u>SEMESTER - I</u>

CA18113	DATA STRUCTURES	L 3	T 0	P 0	C 3

Prerequisite:

Objectives:
1. *To master the design and data structure applications of linear data structures, tree, and graph Structures*
2. *To know various algorithm design and analysis techniques.*

UNIT - I　　　　DATA STRUCTURES　　　　　　　　　　　　　　　　　　**[9]**

Introduction – Arrays – Structures – Stack: Definition and Examples, Representing Stacks - Queues and Lists: Queue and its Representation, Lists – Applications of Stack, Queue and Linked Lists.

UNIT - II　　　　TREES　　　　　　　　　　　　　　　　　　　　　　　**[9]**

Binary Trees – Operations on Binary Trees - Binary Tree Representations – Node Representation, Internal and External Nodes, Implicit Array Representation – Binary Tree Traversals – Huffman Algorithm – Representing Lists as Binary Trees.

UNIT - III　　　　SORTING AND SEARCHING　　　　　　　　　　　　　**[9]**

General Background – Exchange Sorts – Selection and Tree Sorting – Insertion Sorts – Merge and Radix Sorts – Basic Search Techniques – Tree Searching – General Search Trees – Hashing.

UNIT - IV　　　　GRAPHS AND THEIR APPLICATIONS　　　　　　　　**[9]**

Graphs – An Application of Graphs – Representation – Transitive Closure - Warshall's Algorithm – Shortest Path Algorithm – A Flow Problem – Dijkstra's Algorithm – An Application of Scheduling - Linked Representation of Graphs – Graph Traversals.

UNIT - V　　　　STORAGE MANAGEMENT　　　　　　　　　　　　　　**[9]**

General Lists: Operations, Linked List Representation, Using Lists, Freeing List Nodes - Automatic List Management: Reference Count Method, Garbage Collection, Algorithms, Collection and Compaction.

Total　= 45 Periods

Course Outcomes: On Completion of this course, the student will be able to
1. *Express the concept of list data structure and its implementations*
2. *Compare the concept of binary, binary search and binary tree traversals.*
3. *Know the concept of sorting and its types.*
4. *Apply the concept of graph and its representation.*
5. *Gain the knowledge about the list concepts.*

Text Book :

1　Weiss "Data Structures and Algorithm Analysis in C″, Addison Wesley, Second Edition, 2010.

Reference Books :

1　Robert Kruse & Clovis L. Tondo ″Data Structures and Program Design in C",Prentice Hall 2nd edition.,1991.

2　Tanaenbaum A.S.,Langram Y. Augestein M.J "Data Structures using C" Pearson Education, 2004.

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018

<u>SEMESTER –I</u>

		L	T	P	C
CA18121	**DATA STRUCTURES LAB**	0	0	3	2

Prerequisite: Data Structures

Objectives:
1. *To develop programming skills in design and implementation of data structures and their applications*

LIST OF EXPERIMENTS:

1. Represent the given Sparse Matrix using One Dimensional Array and Linked List.
2. Create a Stack and do the following Operations Using Arrays and Linked Lists.
(I) Push
(II) Pop
(III) Peep
3. Create a Program for Infix, Prefix and Postfix Notation Using Stack Operation.
4. Create a Queue and do the following Operations Using Arrays and Linked Lists.
(I)Add
(II) Remove
5. Implement the Operations on Singly Linked List, Doubly Linked List and Circular Linked List.
6. Create a Binary Search Tree and do the following Traversals.
(I) In-Order
(II) Pre Order
(III) Post Order
7. Implement the following Operations on a Binary Search Tree.
(I) Insert a Node
(II) Delete a Node
8. Sorting the given List of Numbers using Heap and Quick Sort.
9. Perform the following Operations in a given Graph.
(I) Depth First Search
(II) Breadth First Search
10. Find the Shortest Path in a given Graph using Dijkstra's Algorithm.

Total : 45 Periods

Course Outcomes: On Completion of this course, the student will be able to
1. *Demonstrate the array and linked list implementation of list ADT..*
2. *Demonstrate traversal of stack and queue using ADT.*
3. *Implement the operation of list and binary search tree ADT.*
4. *Implement the operation of binary search tree.*
5. *Perform depth first search and breadth first search.*

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018

<u>SEMESTER - I</u>

CA18114	DATABASE MANAGEMENT SYSTEMS	L T P C
		3 0 0 3

Prerequisite:

Objectives:

1. *Emphasize the need, role, importance and uses of databases in application development*
2. *Design E-R modeling for a given situation and provide the foundation for development of relational database structure.*
3. *Identify the advantages of the database approach over the file based data storage system.*
4. *Distinguish between different models of file organizing, storing and using of data.*
5. *Know the relational model and relational algebra operations.*
6. *Normalize the relational tables applying normalization rules.*
7. *Apply PL/SQL procedural interfaces statement on relational tables as per requirements*

UNIT - I   INTRODUCTION   **[9]**

Database System Applications – Purpose of Database System. VIEW OF DATA: Data Abstraction – Instances and Schemas – Data Models – Relational Database – Database Design –The Entity Relationship model.

UNIT - II   STORAGE AND FILE STRUCTURE   **[9]**

Overview of physical storage media – Magnetic Disks – Tertiary Storage – Storage Access. FILE ORGANIZATION: Fixed Length Records – Variable Length Records. ORGANIZATION OF RECORDS IN FILES: Sequential File Organization – Multi table Clustering File Organization – Data Dictionary Storage.

UNIT - III   RELATIONAL MODEL   **[9]**

Structure of Relational Databases –Fundamental Relational Algebra Operation. TRANSACTIONS: Transaction Concept – Transaction State – Implementation of Atomicity and Durability – Concurrent Execution-Serializability.

UNIT - IV   SQL   **[9]**

Background – Data Definition- Basic Structure of SQL Queries – Set Operations – Aggregate Functions –Nested sub queries – Views – Joined Relations. RELATIONALDATABASE DESIGN: Atomic Domain and First Normal Forms. DECOM POSITION USING FUNCTIONAL DEPENDENCIES: Keys and Functional Dependencies – Third Normal Form Boyce Codd Normal Form.

UNIT - V   INTRODUCTION OF PL/SQL   **[9]**

Advantages of PL/SQL –The Generic PL/ SQL Block. PL/SQL: Data types –Variables – Constants – Control Structures Cursors – Exception Handling –Procedures and Functions –Packages – Triggers.

Total = 45 Periods

Course Outcomes: On Completion of this course, the student will be able to

1. *Express the knowledge of data base systems and analyze the various data models.*
2. *Employ the concept of data definition language and data manipulation language.*
3. *Express the knowledge of secondary storage device to store the data.*
4. *Describe the knowledge of query processing and its operations.*
5. *Apply the various concurrency control techniques in database transactions.*

Text Book :

1.Abraham Silberschatz ,Henry F.Korth ,S.Sudarshan ,"Database System Concepts", 5th Ed., Tata McGraw –Hill, Singapore, Reprint 2016 UNITS: I, II, III & IV

2.Ivan Bayross,"The Programming Languages of Oracle", 3rd Edition, BPB Publications, New Delhi, Reprint 2018. Unit: V

Reference Books :

1.C.J Date 'An Introduction to Database System", Pearson Education, New Delhi, Reprint 2015

2.P.S.Deshpande "SQL & PL/SQL for Oracle 10g", Dream Tech Press,NewDelhi, Reprint 2017.

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018

<u>SEMESTER –I</u>

		L	T	P	C
CA18122	DATABASE MANAGEMENT SYSTEMS LAB	0	0	3	2

Prerequisite:

Objectives:

LIST OF EXPERIMENTS

01. DDL, DML and DCL Queries

02. Aggregate Functions and Set Operations

03. Normalization

04. Joins

05. Nested Sub Queries and Correlated Sub Queries

06. Views

   PL/SQL

07. Cursors

08. Procedures

09. Functions

10. Packages

11. Triggers

12. Exception Handling

Total : 45 Periods

Course Outcomes: On Completion of this course, the student will be able to
1. *Populate and query a database using DML/DDL commands.*
2. *Design a table and apply aggregate function and set operations.*
3. *Normalize the database using normalization rules.*
4. *Apply PL/SQL for query processing.*
5. *Design nested sub queries and correlated sub queries for a given problem.*
6. *Use PL/SQL stored procedure, stored functions, cursors and packages to query the database*

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018

<u>SEMESTER - I</u>

CA18115	PROBLEM SOLVING USING ' C '	L 3	T 0	P 0	C 3

Prerequisite: Programming in C

Objectives:

1. *The objective of learning is to develop problem-solving skills and couple them with top down design principles, it also the way to competent at algorithm design and program implementation. it provides useful guidance in separating the tasks of learning how to develop computer algorithms and implementing them in programming language like c.*

UNIT - I   INTRODUCTION TO COMPUTER PROBLEM SOLVING   [9]

Introduction – The Problem Solving Aspect – Top Down Design – Implementation of Algorithms – Program Verification – Efficiency of Algorithms – Analysis of Algorithms.

UNIT - II   FUNDAMENTAL ALGORITHMS   [9]

Introduction – Exchanging the Values – Counting – Factorial Computation – SINE Computation – Base Conversion – Factoring Methods – Array Techniques.

UNIT - III   INTRODUCTION TO C LANGUAGE   [9]

Overview of C – Constants, Variables and Data Types – Operators and Expressions – Managing Input/output Operations – Formatted I/O – Decision Making – Branching –- IF, Nested IF – Switch – Go to – Looping- while, Do, for Statements.

UNIT - IV   ARRAYS, FUNCTIONS, STRUCTURES AND UNIONS   [9]

Arrays – Dynamic and Multi-Dimensional Arrays – Character Arrays and Strings – String Handling Functions – User Defined Functions – Categories of Functions – Recursion – Structures and Unions – Array of Structures – Structures and Functions

UNIT - V   POINTERS AND FILE MANAGEMENT   [9]

Pointers – Declaration, Accessing a Variable, Character Strings, Pointers to Functions and Structures – File Management in C – Dynamic Memory Allocation – Linked Lists – Preprocessors.

Total = 45 Periods

Course Outcomes: On Completion of this course, the student will be able to

1. *Recognize the introduction about the problem solving methods.*
2. *Capture the fundamentals of c - constants, variables and data types, different operators and expressions in c Language.*
3. *Describe different input and output operations with different formats and programs using different branching and looping statements.*
4. *Obtain knowledge about user defined functions and scope of variables in c.*
5. *Identify the concept of file, file operations and types of files.*

Text Book :

1   R.G.Dromey "How to Solve it by Computer", Pearson Education, India, 2007.

2.   Herbert Schildt, C – The Complete Reference, McGraw Hill, New York, 2000.

Reference Books :

1   Deitel and Deitel "C How to Program", Addisson Wesley, 2001.

2   Brian W.Kernighan & Dennis Ritchie "C Programming Language", PHI, 1990.

3   Byron.S.Gottfried "Schaum's Outline of Programming with C", 2nd Edition, 1996.

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018

<u>SEMESTER –I</u>

		L	T	P	C
CA18123	C PROGRAMMING LAB	0	0	3	2

Prerequisite: Programming in C

Objectives:
  1. *The main objective of programming in C is to develop the problem solving techniques.*

LIST OF EXPERIMENTS

1. Display the following:
(i) Floyds triangle   (ii) Pascal Triangle.

2. Generate the following series of numbers:

(i) Armstrong numbers between 1 to 100. (ii) Prime Numbers between 1 to 50. (iii) Fibonacci Series up to N numbers.

3. Manipulate the Strings with Following Operations
i) Concatenating two strings. ii) Reversing the String. iii) Finding Length of the String. iv)Determine Palindrome String.

4. Find the Summation of the Following Series
(i) Sine   (ii) Cosine (iii) Exponential.

5. Simulate Following Banking Operations Using Functions.
(i) Deposit (ii) Withdrawal (iii) Balance Enquiry.

6. Implement Using Recursion
(i) Fibonacci Number Generation. (ii) Factorial.

7. Implement the Array Using Following Concepts.
i)To Find Both the Largest and Smallest Number in a List of Integers.
ii) To Perform the Addition, Multiplication of Two Matrix.

8. Write a Program that Implements the Following Concepts of Function.
I) Function with No Arguments and No Return Value. ii) Function with No Arguments but Return Value.
iii) Function with Arguments but No Return Value. iv) Functions with Arguments and Return Value.

9. Generate Student Mark Sheets Using Structures.
10. Perform String Operations Using Pointers.
11. Write a Program to Create a File Having the Fields Namely Roll No, Student Name, Sex (Male/Female), Result (Pass /Fail)

Total : 45 Periods

Course Outcomes: On Completion of this course, the student will be able to
  1. *Demonstrate the ability to use the editor, compiler, and linker to create source, object, and executable code*
  2. *Debugging of a simple 'C' program.*
  3. *Gain the knowledge of the string and its operation.*
  4. *Use various string handling arrays as part of the problem solution.*
  5. *Reveal the concept of function and recursive function.*
  6. *Implement the concept of structure data type as part of the solution and Utilize pointers to efficiently solve problems.*

K.S.R. COLLEGE OF ENGINEERING (Autonomous)

R 2018

SEMESTER - II

CA18211   OPERATING SYSTEMS

L	T	P	C
3	0	0	3

Prerequisite:

Objectives:

1. *To get a comprehensive knowledge of the architecture of distributed systems, understand the deadlock and their solutions in distributed environments, to get the knowledge of failure recovery and fault tolerance to know the security issues and protection mechanisms for distributed environments, to get knowledge of multiprocessor operating system.*

UNIT - I   INTRODUCTION   [9]

Definition of OS - Mainframe System - Desktop Systems - Multi Processor System – Distributed - Clustered - Real Time Systems - Handheld Systems - Operating System Structure – System Components - Services - System Calls - System Programs - System Design and Implementation.

UNIT - II   PROCESS MANAGEMENT   [9]

Concepts - Process Scheduling - Operations on Processes - Co-Operating Processes – Inter Process Communication - CPU Scheduling - Scheduling Concepts - Criteria – Scheduling Algorithms - Multiprocessor Scheduling - Real Time Scheduling.

UNIT - III   PROCESS SYNCHRONIZATION   [9]

Critical Section - Synchronization Hardware – Semaphores - Problems of Synchronization - Critical Regions – Monitors – Deadlocks – Characterization - Handling Deadlocks – Deadlock Prevention – Avoidance – Detection - Deadlock Recovery.

UNIT - IV   MEMORY MANAGEMENT   [9]

Storage Hierarchy - Storage Management Strategies – Contiguous - Non Contiguous Storage Allocation - Single User - Fixed Partition - Variable Partition – Swapping - Virtual Memory – Basic Concepts - Multilevel Organization - Block Mapping – Paging – Segmentation – Page Replacement Methods – Locality - Working Sets.

UNIT - V   I/O AND FILE SYSTEMS   [9]

Disk Scheduling - File Concepts - File System Structure - Access Methods - Directory Structure – Protection – Directory Implementation - Allocation Methods - Free Space Management – Case Study: Linux System, Windows,.

Total = 45 Periods

Course Outcomes: *On Completion of this course, the student will be able to*

1. *Identify with the basics of operating systems and its components.*
2. *Examine the scheduling algorithms, know about the critical section problem.*
3. *Describe classical synchronization problem and semaphores.*
4. *Classify the storage management, paging and segmentation.*
5. *Know disk structure and disk scheduling algorithms and analyze the concept of allocation methods, directory structure and free space management.*

Text Book :

1   Silberschatz and Galvin, Operating System Concepts, 6th Edition, John Wiley & Sons, Inc., 2018.

Reference Books :

1   Milankovic M., Operating System Concepts and Design, 2nd Edition, McGraw Hill, 1992.

2   P.C.Bhatt, An Introduction to Operating Systems-Concepts and Practice, Prentice Hall Of India, 2004.

3   H.M.Deitel, An Introduction to Operating Systems, 2nd Edition, Pearson Education, 2002.

K.S.R. COLLEGE OF ENGINEERING (Autonomous)

R 2018

SEMESTER - II

CA18212	DESIGN AND ANALYSIS OF ALGORITHMS	L	T	P	C
		3	0	0	3

Prerequisite:

Objectives:
1. Knowing general problem solving strategies like divide and conquer method greedy method, dynamic, backtracking and branch and bound
2. To introduce the mathematical aspects of Analyzing an algorithm
3. Measuring algorithm performance for best-case, worst-case & average-case
4. To study the concepts of P-NP hard and complete problems
5. To introduce the various advanced algorithm such as Approximation• algorithms and Randomized algorithms

UNIT - I   INTRODUCTION   [9]

Fundamentals of algorithmic problem solving - Important problem types - Fundamentals of the analysis of algorithm efficiency - analysis frame work Asymptotic notations - Mathematical analysis for recursive and non-recursive algorithms.

UNIT - II   DIVIDE AND CONQUER METHOD,GREEDY METHOD   [9]

Divide and conquer methodology - Merge sort - Quick sort - Binary search - Binary tree traversal - Multiplication of large integers - Strassen's matrix multiplication - Greedy method - Prim's algorithm - Kruskal's algorithm - Dijkstra's algorithm.

UNIT - III   DYNAMIC PROGRAMMING   [9]

Computing a binomial coefficient - Warshall's and Floyd' algorithm - Optimal binary search tree - Knapsack problem - Memory functions – Randomized algorithms.

UNIT - IV   BACKTRACKING,BRANCH AND BOUND   [9]

Backtracking - N-Queens problem - Hamiltonian circuit problem – Subset sum problem - Branch and bound - Assignment problem - Knapsack problem - Travelling salesman problem.

UNIT - V   NP-HARD AND NP-COMPLETE PROBLEMS   [9]

P & NP problems - NP-complete problems - Approximation algorithms 51 for NP-hard problems - Traveling salesman problem - Knapsack problem.

Total = 45 Periods

Course Outcomes: *On Completion of this course, the student will be able to*

1. Analyze the iterative and Recursive algorithms
2. Design and Implement Problem Solving Techniques such as Divide and Conquer, Greedy method, Dynamic Programming, Backtracking and Branch and Bound.
3. Analyze the efficiency of NP Problems
4. Work with advanced algorithms and its complexity analysis

Text Book :

1   Anany Levitin "Introduction to the Design and Analysis of Algorithms" Pearson Education, 2012

2   Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, "Introduction to algorithms", Prentice Hall, 2009.

Reference Books :

1   Ellis Horowitz, Sartaj Shani and Sanguthevar Rajasekaran, "Fundamentals of Computer Algorithms", Universities Press, Hyderabad, Second Edition, 2008.
2   Sara Basse and Allen Van Gelder, "Computer Algorithms – Introduction to Design & Analysis", Pearson Education, New Delhi, Third Edition, 2000.

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018

<u>SEMESTER –II</u>

CA18221	ALGORITHMS LAB	L	T	P	C
		0	0	3	2

Prerequisite: Data Structures Lab

Objectives:
1. To write programs on Basic Sorting methods
2. To write programs using Divide and Conquer
3. To write programs on Tree and Graph applications
4. To write programs using Greedy and Dynamic Programming
5. To write programs using Back Tracking and Branch & Bound

LIST OF EXPERIMENTS

1. Apply the divide and Conquer technique to arrange a set of numbers using merge sort method.

2. Perform Stassen's matrix multiplication using divide and conquer method.

3. Solve the knapsack problem using greedy method.

4. Construct a minimum spanning tree using greedy method.

5. Construct optimal binary search trees using dynamic programming method of problem solving.

6. Find the solution for traveling salesperson problem using dynamic programming approach.

7. Perform graph traversals.

8. Implement the 8 Queens Problem using backtracking.

9. Implement knapsack problem using backtracking.

10. Find the solution of traveling salesperson problem using branch and bound technique.

Total : 45 Periods

Course Outcomes: On Completion of this course, the student will be able to
1. On completion of the course, students should be able to Write programs on Basic Algorithm design methods
2. Write programs using Divide and Conquer
3. Write programs on Tree and Graph applications
4. Write programs using Greedy and Dynamic Programming
5. Write programs to solve problems based on Back Tracking
6. Write programs to solve problems on Branch & Bound

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018

SEMESTER - II

MA18233	DISCRETE MATHEMATICS	L 3	T 0	P 0	C 3

Objectives:
1. To study the mathematical logics and its applications and to familiarize with the basics of set theory.
2. To study the concepts of Graph theory.
3. To know the concepts of Formal Languages & Finite Automata.

UNIT - I   MATHEMATICAL LOGIC   [9]

Propositions and Logical Operators - Truth Table - Propositions Generated by a Set, Equivalence and Implication - Basic Laws - Some more Connectives – Functionally Complete Set of Connectives - Normal Forms - Proofs in Propositional Calculus.

UNIT - II   BASIC SET THEORY   [9]

Basic Definitions - Venn Diagrams and Set Operations - Laws of Set Theory - Principle of Inclusion and Exclusion – Partitions - Permutation and Combination – Relations - Properties of Relations - Matrices of Relations - Closure Operations on Relations - Functions - Injective, Subjective and Bijective Functions.

UNIT - III   GRAPH THEORY   [9]

Basic Definitions – Degree – Graph Connectivity – Euler and Hamilton Graphs - Planar Graph – Graph Coloring.

UNIT - IV   FORMAL LANGUAGES   [9]

Languages and Grammars - Phrase Structure Grammar - Classification of Grammars - Pumping Lemma for Regular Languages-Context Free Languages.

UNIT - V   FINITE STATE AUTOMATA   [9]

Finite State Automata-Deterministic Finite State Automata(DFA), Non Deterministic Finite State Automata (NFA)-Equivalence of DFA and NFA-Equivalence of NFA and Regular Languages.

Total = 45 Periods

Course Outcomes: *On Completion of this course, the student will be able to*
1. Interpret the basics of mathematical logic.
2. Acquire knowledge in set theory.
3. Apply the concepts of Graph Theory.
4. Develop their skills in languages and grammars.
5. Interpret the concepts of finite state automata.

Reference Books :

1   Kenneth H Rosen, "Discrete Mathematics", 9th Edition, Tata McGraw Hill 2013.

2   J.P.Tremblay, R.Manohar "Mathematical Structures with Applications to Computer Science"TataMcGrawHill Ed. 2014.

3   Hopcroft & Ullman, "Introduction to Automata Theory, Languages and Computation", Narosa Publishing House, Delhi, 2015.

4   Swapan Kumar Chakraborty & BikashKantiSarkar, "Discrete Mathematics" Oxford University Press, 2014.

5   Taha H. A. , "Operations Research: An Introduction " 7th Edition, Pearson Education, 2015.

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   **R 2018**

<u>SEMESTER - II</u>

EC18234	MICROPROCESSOR AND ITS APPLICATIONS	L	T	P	C
		3	2	0	4

Prerequisite: Digital Fundamentals and Computer Organization

Objectives:
1. *To study about the basic concepts of microprocessor (8085).*
2. *To study about 8086 microprocessor and its programming.*
3. *To study about applications of 8085/86 microprocessor.*
4. *To learn about advanced microprocessor.*
5. *To study about concepts of microcontrollers.*

UNIT - I   INTRODUCTION   [12]

Introduction to Microprocessor and Microcontroller-Architecture of 8085 Microprocessor- Instruction Set and Addressing Modes of 8085 –Assembly Language Programs of 8085.

UNIT - II   8086 MICROPROCESSOR   [12]

Architecture of 8086-Instruction Set and Addressing Modes of 8086 Microprocessor- Assembly Language Programs and Commands of 8086.

UNIT - III   APPLICATIONS OF 8085/8086 MICROPROCESSORS   [12]

Seven Segment Display-Measurements of Electrical Quantity and Physical Quantities-Traffic Control-Stepper Motor.

UNIT - IV   PENTIUM AND RISC PROCESSOR   [12]

Pentium Intel Architecture-Operating Modes-Segmentation-Pin Description of Pentium Processor-Bus Interfacing-Pentium MMX-Pentium Pro, Pentium II and Pentium III:P6 Family Processor-Pentium IV Processor-RISC Processor.

UNIT - V   MICROCONTROLLER   [12]

Architecture of 8051 Microcontroller-Memory Organization-Serial Communication-Interrupts- Instruction Set and Addressing Modes.

Total (L : 45 T : 15) = 60 Hours

Course Outcomes: *On Completion of this course, the student will be able to*
1. *Considerateing how the processor stores and manipulates data, the basic arithmetic and logical operations performed by the 8085 microprocessor.*
2. *Learning the architecture and functioning of 8086.*
3. *Knowing the concept of applications of 8085 / 8086 micro processors.*
4. *Know the architecture of Pentium Intel and its description processors.*
5. *Design various types of serial communication function, addressing modes.*

Text Book :

1   Soumitrakumarmandal,"Microprocessors and Microcontrollers", Architecture, Programming and Interfacing using 8085, 8086 and 8051, Tata McGraw Hill, 2012.

Reference Books :

1   Ramesh G,"Microprocessor Architecture Programming and Applications with 8085", Pen tram international Publishing (India) Pvt.Ltd,5th Edition,2009

2   R.Theagarajan,"Microprocessor and Microcontroller", Scitech Publishing (I) Pvt Ltd, 2nd Edition.

3   Barry B. Brey, "Intel Microprocessors, The 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium, PentiumPro Processor, PentiumII, PentiumII, Pentium IV, Architecture, Programming & Interfacing", Seventh Edition, PHI Learning /   Pearson Education, 2006

K.S.R. COLLEGE OF ENGINEERING (Autonomous)

R 2018

SEMESTER –II

EC18252	MICROPROCESSOR AND MICROCONTROLLER LABORATORY	L	T	P	C
		0	0	3	2

Prerequisite: Digital Fundamentals and Computer Organization

Objectives:
1. *Develop assembly language programs based on 8085, 8086 microprocessors and 8051microcontroller.*
2. *To know about peripheral interfacing with microprocessors and microcontroller.*

LIST OF EXPERIMENTS
1. 8085 Microprocessor
   (i) Arithmetic Operations
   (ii) Array Processing
2. 8086 Microprocessor
   (i) Arithmetic Operations (ii) Sorting and Searching (iii) String Manipulation
3. 8051Microcontroller
   (i) Arithmetic Operations
   (ii) Logical and Bit Manipulation
4. Peripheral Interfacing
   (i) Programmable peripheral interface (8255) using 8085. (ii) Keyboard and display controller (8279) using 8086.
   (iii) Stepper motor using 8085.

Total : 45 Periods

Course Outcomes: On Completion of this course, the student will be able to
1. *Develop assembly language programming for 8085 microprocessor.*
2. *To know assembly language programs for 8086 microprocessor.*
3. *Illustrate programming concepts of microcontroller.*
4. *Demonstrate programming with peripherals.*
5. *Design and develop the programming using simulation software.*

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018

<u>SEMESTER - II</u>

CA18215	OBJECT ORIENTED PROGRAMMING USING C++	L	T	P	C
		3	0	0	3

Prerequisite: Problem Solving and Programming in C

Objectives:
1. *To provide the idea about the concept of objects and classes.*
2. *To gain knowledge about overloading, inheritance and polymorphism.*

UNIT - I   OBJECT ORIENTED PROGRAMMING   [9]

Programming Paradigms - Object Oriented Programming - OOPS Concept - Advantages of OOPS - Difference Between C and C++ - Introduction to C++ - C++ Declarations - Control Structures - Arrays and Pointers.

UNIT - II   CLASSES AND OBJECTS   [9]

Classes and Objects - Functions in C++ - Inline Functions - Friend Function - Passing Objects to Functions - Array of Objects - Static Member Variable and Member Functions - Pointers to Objects – Dynamic Allocation Operators – Working with Strings – Manipulators – Typecasting – This Pointer - Default Arguments.

UNIT - III   CONSTRUCTOR AND OPERATOR OVERLOADING   [9]

Constructor and Destructor – Parameterized Constructor - Multiple Constructor in a Class - Constructor with Default Arguments - Copy Constructor - Dynamic Constructor– Overloading: Function Overloading – Overloading Unary Operators – Overloading Binary Operators – Operator Overloading Using Friend Function – Assertions.

UNIT - IV   INHERITANCE AND TEMPLATES   [9]

Inheritance – Types of Inheritance – Virtual Base Class - Virtual Functions - Pure Virtual Functions - Templates – Function Template and Class Template.

UNIT - V   APPLICATIONS WITH FILES AND EXCEPTION HANDLING   [9]

Introductions – File Stream Classes – Steps of File Operations - Checking for Errors- Finding End of File – File Opening Modes- File Pointers and Manipulators – Sequential Reads and Write Operations – Random Access Operations – Error Handling Functions- Command Line Arguments – Binary & ASCII Files-Exception Handling.

Total = 45 Periods

Course Outcomes: *On Completion of this course, the student will be able to*
1. *Implement the basic concept of C++, declaration, control structure, arrays and pointers.*
2. *Comprehend the concept of classes, objects, static data and member functions.*
3. *Identify with the concept of constructer, destructor.*
4. *Recognize reusability concept through different types of inheritance.*
5. *Illustrate the concept of error handling, command line arguments.*

Text Book :

1   D.S.Malik, "C++ Programming from problem Analysis to Program Design", 2017 Third Edition.

2   Ira Pohl, "Object-Oriented Programming Using C++", Pearson Education, 2008, Second Edition.

Reference Books :

1   Kamthane, "Object Oriented Programming with ANSI and Turbo C++", Pearson Education, 2009.

2   E. Balagurusamy, "Object Oriented Programming with C++", PHI, 2017, Fourth Edition.

3   Stanley B.Lijjman Josee Lajoie, "C++ Primer"2004,Fifth Edition

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018

SEMESTER –II

		L	T	P	C
CA18223	OBJECT ORIENTED PROGRAMMING LAB	0	0	3	2

Prerequisite: Problem Solving and Programming in C

Objectives:
1. At the end of the course students should be familiar with the main features of the C++ language.
2. Be able to write a C++ program to solve a well specified problem.
3. Create a C++ program written by someone else.
4. Be able to debug and test C++ programs;
5. To know how to read C++ doc library documentation and reuse library code.
6. To make the students understand the features of object oriented principles and familiarize them with virtual functions, templates and exception handling.
7. To make the students to develop applications using C++.

LIST OF EXPERIMENTS

1. Simple C++ Programs to Implement Various Control Structures.
   a. If statement
   b. Switch case statement and do while loop
   c. For loop
   d. While loop
2. Programs to Understand Structure & Unions.
   a. Structure
   b. union
3. Programs to Understand Pointer Arithmetic.
4. Functions & Recursion.
   a. Recursion
   b. function
5. Inline Functions.
6. Programs to Understand Different Function Call Mechanism.
   a. Call by reference & Call by Value
7. Constructors & Destructors.
8. Use of "this" Pointer. Using class
9. Programs to Implement Inheritance and Function Overriding.
   a. Multiple inheritance –Access Specifiers
   b. Hierarchical inheritance – Function Overriding /Virtual Function
10. Programs to Understand Friend Function & Friend Class.
    a. Friend Function
    b. Friend class

Total : 45 Periods

Course Outcomes: On Completion of this course, the student will be able to
1. Students will be able to apply the computer programming techniques to solve practical problems.
2. Students will be able to understand the concepts and implementation of constructors and destructors.
3. Students will be able to develop software applications using object oriented programming language in C++
4. Student can be able to understand and use the basic programming constructs of C++
5. Students are able to learn C++ data types, memory allocation/de allocations, functions and pointers.
6. Students are able to apply object oriented programming concepts to software problems in C++

K.S.R. COLLEGE OF ENGINEERING (Autonomous)　　　　　　R 2018

SEMESTER - III

		L	T	P	C
CA18311	DATA COMMUNICATION AND NETWORKS	3	0	0	3

Prerequisite: Computer Networks

Objectives:
1. *To provide the deep knowledge about the communications based on transmission media, protocol models and finally about different layers of networks.*

UNIT - I　　　　DATA COMMUNICATIONS　　　　　　　　　　　　　　　[9]

Components – Direction of Data Flow – Networks – Components and Categories – Types of Connections – Topologies – Protocols and Standards – ISO / OSI Model – Transmission Media – Coaxial Cable – Fiber Optics.

UNIT - II　　　　DATA LINK LAYER　　　　　　　　　　　　　　　　[9]

Error – Detection and Correction – Parity – LRC – CRC– Flow Control and Error Control - Stop and Wait – Go Back-N ARQ – Selective Repeat ARQ- Sliding Window – HDLC- LAN - Ethernet IEEE 802.3 - IEEE 802.4 – IEEE 802.5 - IEEE 802.11 – FDDI – Bridges.

UNIT - III　　　　NETWORK LAYER　　　　　　　　　　　　　　　　[9]

Internetworks – Packet Switching and Datagram Approach – IP Addressing Methods – Sub Netting – Routing – Distance Vector Routing – Link State Routing – Routers.

UNIT - IV　　　　TRANSPORT LAYER　　　　　　　　　　　　　　　[9]

Duties of Transport Layer – Multiplexing – Demultiplexing – Sockets – User Datagram Protocol (UDP) – Transmission Control Protocol (TCP) – Congestion Control – Quality of Services (QOS) – Integrated Services.

UNIT - V　　　　APPLICATION LAYER　　　　　　　　　　　　　　　[9]

Domain Name Space (DNS) – SMTP – FTP – HTTP - WWW – Security – Cryptography.

　　　　　　　　　　　　　　　　　　　　　　　　　　　　　Total = 45 Periods

Course Outcomes: *On Completion of this course, the student will be able to*
1. *Know the concept of components, categories and ISO/OSI model of networks.*
2. *Describe the concept of various error detection techniques and flow, error control.*
3. *Compare the concept of circuit switching and packet switching.*
4. *Appraise user datagram and transmission control protocol.*
5. *Identify the purpose of domain name space, email and FTP.*

Text Book :

1　Behrouz A. Forouzan, "Data communication and Networking", Tata McGraw-Hill, 2012.

Reference Books :

1　James F.Kurose & KeithW.Ross,"Computer Networking: A Top-Down Approach Featuring TheInternet",PE, 2005.

2　Andrew S. Tanenbaum, "Computer Networks", PHI, Fourth Edition, 2010.

3　William Stallings, "Data and Computer Communication", Sixth Edition, Pearson Education, 2010.

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018

SEMESTER –III

CA18321	NETWORKS LAB	L	T	P	C
		0	0	3	2

Prerequisite: Computer Networks

Objectives:
1. *To learn socket programming and to analyze the performance of protocols in different Layers in computer networks.*

LIST OF EXPERIMENTS

01. Applications using TCP Sockets

    A. Echo Client and Echo Server.

    B. File Transfer.

02. Applications using UDP Sockets

    A. DNS.

03. Applications using Raw Sockets

    A. Ping.

04. RPC

05. Shortest Path Routing Protocols

06. Sliding Window Protocol

07. Implementation of ARP

08. Implementation of RARP

09. Development of Applications Multiuser Chat

10. Development of Applications URL Web Page Downloading

Total : 30 Periods

Course Outcomes: On Completion of this course, the student will be able to
1. *Demonstrate the applications using TCP sockets like echo client, echo server and file transfer.*
2. *Illustrate the applications using raw sockets like ping, trace route.*
3. *Experiments using shortest path routing protocols.*
4. *Develop an application such as HTTP and E-Mail.*
5. *Perform the concept of multiuser chat application.*

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018

SEMESTER - III

		L	T	P	C
CA18312	SOFTWARE ENGINEERING	3	2	0	3

Prerequisite: System Analysis and design

Objectives:
1. *To know the deep knowledge about software and its basic concepts.*
2. *Acquire knowledge about the models and the requirements of software.*
3. *To be familiar with the designs of software and its principles.*
4. *To learn the basic idea about the software testing and configuration.*
5. *To gain the exposure on managing the project.*

UNIT - I   SOFTWARE PROCESS   [9]

Introduction –Process Models: A Generic Process Model-Process Assessment and Improvement- Prescriptive Process Models - Specialized Process Models- Unified Process-Personal and Team Process Models-Process Technology-Product and Process.

UNIT - II   SOFTWARE REQUIREMENTS   [9]

Requirement Analysis-Scenario Based Modeling-UML Models that Supplement the Use Case- Data Modeling Concepts-Class Based Modeling-Requirement Modeling Strategies – Flow Oriented Modeling.

UNIT - III   DESIGN CONCEPTS AND PRINCIPLES   [9]

The Design process- Design Concepts-The Design Model-Architectural Design – Software Architecture – Architectural Genres - Architectural Styles – Architectural Design.

UNIT - IV   SOFTWARE TESTING   [9]

Strategic Approach to Software Testing-Strategic Issues- Validation Testing- System Testing- The Art of Debugging-Testing Conventional Applications –Software Configuration Management- White Box Testing- Basis Path Testing – Control Structure Testing- Black Box Testing.

UNIT - V   SOFTWARE PROJECT MANAGEMENT   [9]

Project Management Concepts–Process and Project Metrics- Risk Management- Maintenance and Reengineering-Metrics in the Process and Project Domains, Metrics for Software Quality.

Total = 45 Periods

Course Outcomes: *On Completion of this course, the student will be able to*
1. *Know the basic concept of process model and process technology.*
2. *Describe the various models in software requirement technique strategies.*
3. *Describe the concept of design of software.*
4. *Apply the concept of software testing strategies.*
5. *Predict the software project.*

Text Book :

1   Roger S.Pressman, Software Engineering- A practitioners Approach, McGraw Hill International Ed., 7th Ed., 2010.

Reference Books :

1   Ian Summerville, Software Engineering, Pearson education Asia, 6th edition, 2006

2   PankajJalote- An Integrated Approach to Software Engineering, Springer Verlag, 1997

3   James F Peters and Witold P, "Software Engineering – An Engineering Approach",John and Sons, Delhi, 2000

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018

SEMESTER - III

CA18313	JAVA PROGRAMMING	L	T	P	C
		3	0	0	3

Prerequisite: Object Oriented Programming using C++

Objectives:
1. *To gain the basic knowledge programming concepts of java.*
2. *To know how to import user defined package, to create thread program and stringmethods.*
3. *To learn about the input/output and networking package classes and methods.*
4. *To learn about the abstract windowing toolkit and applet package classes and methods.*
5. *To know the basic concept of swing, JDBC and servlet.*

UNIT - I   OVERVIEW OF JAVA   [9]

Object Oriented Programming Concepts- Introduction- Lexical Issues- Data Types- Variables and Arrays Operators – Control Statements – Methods –Method Overriding.

UNIT - II   PACKAGES   [9]

Packages – Importing Packages- I/O Package – Interfaces – Exception Handling – Multithreaded Programming- String Operations. The Java I/O Classes– File – Byte Streams – The Character Streams – Serialization.

UNIT - III   JAVA PACKAGES: AWT, APPLET   [9]

AWT Package: AWT Classes – Window Fundamentals – Working with Graphics– Working with Color – Working with Fonts – Applet Package: Applet Basics – Applet Architecture – Reading and Writing in Console – Print Writer class.

UNIT - IV   JAVA SWING   [9]

Java Swing-Applet-Icons and Labels-Text Fields-Buttons-Combo Box-Tabbed Panes-Scroll Panes-Trees-Tables-Exploring Swing.

UNIT - V   SOFTWARE DEVELOPMENT USING SERVLET   [9]

JDBC – Servlets – Life Cycle of a Servlet – The Servlet API –Servlet and Http Package.

                                     Total = 45 Periods

Course Outcomes: *On Completion of this course, the student will be able to*
1. *Recognize the basic object oriented programming concepts and know the origin of java programming.*
2. *Identify different operations through single packages and understanding the String concepts.*
3. *Learning the concept of java I/O packages.*
4. *Gain the concept of AWT package.*
5. *Describe the concept of server side programming and perform database connectivity using JDBC.*

Text Book :

1. Herbert Schildt" The Complete Reference JAVA", 10th Edition-, Tata McGraw Hill, 2017.

Reference Books :

1. Herbert Schildt,"The Complete Reference", 8th Edition-, Tata McGraw Hill, 2011.

2. Kogent,"Java 6 Programming Black Book" Edition 2011, Kogent Learning Solutions.

3. Steven Holzner, "Java2(JDK 5 Edition) Programming" 2008 edition

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018

SEMESTER –III

CA18322   JAVA PROGRAMMING LAB

L	T	P	C
0	0	3	2

Prerequisite: C++ Lab

Objectives:
To make the students clear in core java concepts

LIST OF EXPERIMENTS

1. Write a Java Program to Illustrate the use of Object Oriented Programming Concepts

2. Write a Java Program to Illustrate the use of Overriding.

3. Write a Java Program to Implement String Handling Functions.

4. Write a Java Program to Implement File Operations.

5. Create a Calculator Using AWT Controls and use Event Handling for Calculations.

6. To Illustrate a Java Program to Implement Java Database Connectivity

7. Create a Java Application using Packages.

8. Create a Java Application using Database Connectivity

9. To Develop an Applet Program using Swing.

10. To Develop a Java Application using Servlet.

Total : 30 Periods

Course Outcomes: On Completion of this course, the student will be able to
   1. *Demonstrate the concepts of overriding.*
   2. *Implement the exception handling concept.*
   3. *Perform the concept of downloading web pages.*
   4. *Perform the programs using applet.*
   5. *Develop a program using Servlet.*

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018

<u>SEMESTER - III</u>

CA18314	COMPUTER GRAPHICS AND MULTIMEDIA	L	T	P	C
		3	2	0	3

Prerequisite: Data Structures & Photoshop

Objectives:
1. *To learn the basics of computer graphics.*
2. *To create transformations in 2D and 3D graphics.*
3. *Knowing multimedia techniques utilized in text, audio, video, graphics & animation.*

UNIT - I   INTRODUCTION   [9]

Introduction, Application area of Computer Graphics, Overview of Graphic System, Video-Display Devices, Raster-Scan Systems, Random Scan Systems, Graphics Monitors, Work Stations and Input Devices-Output Primitives: Points and Lines, DDA and Bresenham's Line Drawing Algorithms, Mid-Point Circle Algorithm.

UNIT - II   2D TRANSFORMATIONS AND VIEWING, CLIPPING CONCEPTS   [9]

2-D Geometrical Transformations: Translation, Scaling, Rotation, Reflection and Shear Transformation Matrix Representations and Homogeneous Co-Ordinates, Composite Transformations, Transformations Between Coordinates- 2-D Viewing : The Viewing Pipe-Line, Viewing Coordinate Reference Frame, Window to View-Port Co-Ordinate Transformations, Viewing Function, Cohen-Sutherland Line Clipping Algorithms, Sutherland- Hodgeman Polygon Clipping Algorithm.

UNIT - III   3D TRANSFORMATIONS & VISIBLE SURFACE DETECTIONS TECHNIQUES   [9]

3-D Geometric Transformations: Translation, Rotation, Scaling, Reflection and Shear Transformation and Composite Transformations-Visible Surface Detection Methods: Classification, Back-Face Detection, Depth-Buffer, Scan-Line, Depth Sorting.

UNIT - IV   OVERVIEW OF MUTIMEDIA   [9]

Introduction-Multimedia Presentation and Production-Characteristics of a Multimedia Presentation-Multiple Media – Hardware and Software Requirements –Use of Multimedia-Steps for Creating a Multimedia Presentation-Digital Representation- Analog Representation-Video Display Systems-Video Adapter Card-Video Display Cable-LCD

UNIT - V   MULTIMEDIA SYSTEMS AND APPLICATIONS   [9]

Introduction –Text-Types of Text – Font-Text Compression-File Formats- Image-Image Types-File Formats -Graphics – Advantage of Graphics –Use of Graphics-Audio-Nature of Sound Waves –Fundamentals Characterics of Sound-Elements of Audio System-Loudspeaker -MIDI-MIDI Messages-Audio Processing Software-Video-Transmission of Video Signals – Video File Formats-Video Editing Software-Animation-Uses of Animation-Key Frames & Tweening-Types of Animation-Animation Software-File Formats.

Total = 45 Periods

Course Outcomes: *On Completion of this course, the student will be able to*
1. *Recognize different types of output primitives in graphics system.*
2. *Implement the basics of transformations.*
3. *To create the application of clipping algorithms.*
4. *Knowledge about the features of different types of multimedia.*
5. *Knowledge about various multimedia applications.*

Text Book :

1   Computer Graphics C version" Donald Hearn and M. Pauline Baker, Pearson/PHI, 2nd Impression 2012.(I-III)

2   Ranjan Parekh, "Principles of Multimedia", Reprint 2010, Tata McGraw-Hill Education. (IV Unit & V Unit)

Reference Books :

1   Computer Graphics Second edition", Zhigand xiang, Roy Plastock, Schaum's outlines, Tata Mc- Grew hill edition.

2   Procedural elements for Computer Graphics, David F Rogers, Tata Mc Grew hill, 2nd edition.

3   Ralf Steinmetz, Klara steinmetz, "Multimedia Computing, Communications and Applications", 2004, Pearson edu.

4   Prabat K Andleigh and Kiran Thakrar, "Multimedia Systems and Design", PHI, 2003.

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018

SEMESTER –III

| CA18323 | COMPUTER GRAPHICS AND MULTIMEDIA LAB | L T P C |
| | | 0 0 3 2 |

Prerequisite: C, C++, Photoshop, Flash

Objectives:
1. *To develop the graphics programming skills.*
2. *To develop the multimedia skills.*

LIST OF EXPERIMENTS

01. To Implement the Graphics Concepts for Creating A Circle & Ellipse.

02. To Implement the Concepts of 2D Transformations

03. To Implement the Concepts of 2D Composite Transformations

04. To Implement the Concepts of 3D Transformations

05. To Implement the Concepts of 3D Composite Transformations

06. To Implement the Concepts of Clipping

07. Image Editing using Photoshop

    a. Color Model - RGB, CMY.

    b.Cropping

    C.Converting Into Different File Formats

    D.Noise Reduction

08. Change A Circle Into A Square using Flash.

09. Create An Animation using Flash With Action Script .

10. Create an Animation Showing the Animals in ZOO using Flash & Action Script. (Duration of   Show Is 10 Minutes & use Sound Clips, Video Clips and Images)

Total : 30 Periods

Course Outcomes: On Completion of this course, the student will be able to
1. *Preparing to use the concepts of 2D and 3D transformations and composite transformations*
2. *Handling visible surface detection*
3. *Implement the concept of clipping*
4. *Develop the concept of image editing tools using Photoshop*
5. *Create a animation using flash*

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018
SEMESTER - III

CA18315	INFORMATION AND NETWORK SECURITY	L	T	P	C
		3	0	0	3

Prerequisite: Networks

Objectives:
1. *To know the role of access control in information systems.*
2. *To explain the cryptanalysis for various ciphers.*
3. *To exemplify the attacks on software and its solutions.*
4. *To explore the operating system security mechanisms.*
5. *To learn the methods to prevent the system and network intrusions.*

UNIT - I   INTRODUCTION   [9]

Information Security: Introduction, Need for information security-security approaches-principles of security-Plain Text and Cipher Text-substitution and Transposition Techniques-Encryption and Decryption-Symmetric and Asymmetric Cryptography-Stenography-key range and key size-types of attacks.

UNIT - II   SYMMETRIC KEY CRYPTOGRAPHIC ALGORITHMS   [9]

Algorithm types and modes-overview of symmetric key cryptography- DES –Working principles of DES - IDEA RC5 – BLOWFISH– AES-Introduction.

UNIT - III   ASYMMETRIC KEY CRYPTOGRAPHIC ALGORITHMS   [9]

Overview of asymmetric key cryptography- RSA algorithm-symmetric and asymmetric key cryptography together-Digital signatures—Message digest-Attacks on Digital Signature-Public Key Infrastructure: Introduction-Digital certificates.

UNIT - IV   INTERNET SECURITY PROTOCOLS   [9]

Basic concepts-SSL-SHTTP-TLS-SET-SSL versus SET- 3D secure protocol -Email security-WAP security-security in GSM User Authentication Mechanisms: Introduction-Authentication basics-passwords -Authentication tokens-certificate based authentication-biometrics authentication-Kerberos-SSO approaches

UNIT - V   NETWORK SECURITY   [9]

Brief Introduction to TCP/IP- firewalls-IP security-Virtual Private Networks case studies on cryptography and security.

                                                            Total = 45 Periods

Course Outcomes: *On Completion of this course, the student will be able to*
1. *Exercise the access control mechanism for better authentication and authorization.*
2. *Perform cryptanalysis for various ciphers.*
3. *Apply solutions to overcome the attacks on software.*
4. *Deploy the various techniques to secure the operating systems.*
5. *Develop solutions to guard against system and network intrusions.*

Text Book :

1 Atul Kahate, "Cryptography and Network Security", Tata McGraw-Hill, 3rd Edition 2013.

Reference Books :

1 William Stallings, "Cryptography and Network Security - Principles and Practices", Prentice Hall   of India, Third Edition, 2011.

2 Bruce Schneier, "Applied Cryptography", John Wiley & Sons Inc, 2011.

3 Michael E.Whitman, Herbert J.Mattord, "Principles of Information Security", Cengage Learning India Private Limited, 4th Edition, 2012.

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018

SEMESTER - III

| HR18041 | CAREER BUILDING SKILLS – I | L 0 | T 2 | P 0 | C 0 |

Prerequisite: Basic Communication Skills

Objectives:
1. *To expose the student to the concepts of communication and provide them problem solving skills.*

UNIT - I   EFFECTIVE ENGLISH – WRITTEN AND SPOKEN ENGLISH   [08]

Basic Rules of Grammar - Parts of Speech – Tenses – Verbs. Sentence Construction - Vocabulary – Idioms & Phrases – Synonyms – Antonyms. Dialogues and Conversations – Essay writing. Exercises to Practice and Improve these Skills.

UNIT - II   ART OF COMMUNICATION & THE HIDDEN DATA INVOLVED   [04]

Verbal Communication - Effective Communication - Active listening and reproducing – Non Verbal Communication - Body Language of Self and Others,Communication in global society - Using tehnology of communication

UNIT - III   WORLD OF TEAMS   [04]

Self Enhancement - Importance of Developing Assertive Skills- Developing Self Confidence – Developing Emotional Intelligence, Importance of Team work – Team vs. Group - Attributes of a Successful Team – Barriers Involved, Working with Groups – Dealing with People- Group Decision Making.

UNIT - IV   QUANTITATIVE APTITUDE I   [07]

Speed Math– HCF & LCM – Ratio & Proportions – Profit & Loss – Number System – Simple Interest & Compound Interest

UNIT - V   REASONING I   [07]

Odd Man Out – Coding and Decoding – Mathematical Operations – Arithmetic Reasoning – Seating Arrangement

Total = 30 Periods

Course Outcomes: *On Completion of this course, the student will be able to*
1. *Student able to compete the competitive exams and improve the communication skills.*

Text Book :

1   Jeff Butterfield, Soft Skills for Everyone, Cengage Learning India Pvt Ltd, New Delhi, 2011 edition

2   E.Suresh,P.Srihari&J.Savithri –Communication Skills and Soft Skills: An Integrated Approach, 2011 ed.,Pearson, Delhi.

3   Abhijit Guha, Quantitative Aptitude for Competitive Examinations, , 4th edition, TMH

Reference Books :

1   Bhatnagar Nitin Communicative English for Engineers and Professionals,2010 edition of Pearson Pub,New Delhi.

2   V.Sasikumar,P.KiranmaiDutt&GeethaRajeevan,Listening&Speaking,Reprint 2007 Pearson Education, New Delhi.

3   R.V.Praveen, Quantitative Aptitude and Reasoning, PHI

4   R.S.Agarwal, Quantitative Aptitude, 3rd edition,TMH

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018

SEMESTER - IV

CA18411	C# AND .NET	L	T	P	C
		3	2	0	3

Prerequisite: Object Oriented Programming Using C++

Objectives:
1. *To properly plan and code increasingly more difficult object- oriented, event-driven programs using .NET.*
2. *To create user-friendly window based and web based applications.*
3. *To build simple applications using AJAX tools in .NET and also in XML.*

UNIT - I   .NET FRAMEWORK   [9]
.NET Architecture – Framework Base Classes and Libraries – Namespaces - Assemblies – C# .NET- Declaration – Decision – Iteration Statements, Inheritance – Operator Overloading –Errors and Exceptions – Arrays and Collections – Delegates and Events – Garbage Collection and Resource Management.

UNIT - II   WINDOWS APPLICATION AND ADO.NET   [9]
Introduction – Working with Menus and Dialog boxes - Architecture of ADO.NET – Connected and Disconnected Database – Working with Data Binding and Datasets.

UNIT - III   BUILDING WEB APPLICATIONS   [9]
Introduction – State Managem ent – Data Access – Data Components and the Dataset – Building a Data Access Component–Adapter Class– Data View Class- Rich Data Controls-Formatting the Grid View –Sorting the Grid View-Data View & Form View.

UNIT - IV   BUILDING WEB APPLICATIONS WITH AJAX EXTENSIONS   [9]
User Controls-Adding Code to User Control – Themes and Master Pages – MVC,MVP - Themes-Master Page Design– Website Navigation-Sitemaps –Tree View- Control –Menu Control – Resources and Localization-W hat is AJAX? – ASP.NET and AJAX – ASP.NET Server –Side Support for AJAX – AJAX Client Support – Getting Familiar with AJAX – The Timer – Updating Progress .

UNIT - V   XML AND WEB SERVICES   [9]
Introduction – Writing and Reading XML Programmatically – JSON - Displaying XML Content with XSL – XML Data Binding –Overview of Web Services – Web Services Standards and Protocols – Creating a W eb Service – Using a Web Service – Securing Web Service⏍

Total = 45 Periods

Course Outcomes: *On Completion of this course, the student will be able to*
1. *Explore the .NET architecture and its classes.*
2. *Discuss about the windows application with ADO.NET.*
3. *Building of web applications with basic concepts.*
4. *Appraise building web applications with AJAX extensions.*
5. *Working with the XML programming concepts and with ADO.NET.*

Text Book :

1   John Sharp, "Visual C# 2005 Step by Step ", Microsoft, Prentice Hall of India (P) Ltd., 2015(Unit 1, 2).

Reference Books :

1   Matthew MacDonald and Mario Szpuszta, "Pro ASP.NET 2.0 in C# 2005", A Press(Unit 3, 5[XML]).

2   Kathleen Kalata "Web Applications using ASP.NET 2.0", Cenage Learning, 2007 (Unit 5 [web Service]).

3   Microsoft ASP.NET 4 Step by Step, George Shepherd, PHI Learning Private Limited, 2010 (Unit [AJAX]).

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018

SEMESTER –IV

CA18421	C# AND .NET LAB	L T P C	
		0 0 3 2	

Prerequisite: Object Oriented Programming Using C++ Lab

Objectives:
1. *To properly plan and code increasingly more difficult object- oriented, event-driven programs using C#.*
2. *To incorporate web programming concepts into the ASP.NET environment.*
3. *To create user-friendly screens, forms, etc. using the windows controls available in C#.*
4. *To manipulate database concept in ADO.NET.*
5. *To create simple web service.*

LIST OF EXPERIMENTS
1. A Bank Collects an Interest on 10% on loans given u p to Rs.5000, 12% for Loans between Rs.5001 and Rs.10000 and 15% for loans above Rs.10000. Write a Console Application to find One Year Interest for a given amount according to the above Lending Policy.

2. Define a Class Named amount. It should have the two variables, Namely Rupees and Paise. It should have One Method to Read in the Values of These Two Variables. Write an Operator Overloading Method for Adding two amounts. Write a Method to Display Amount1, Amount2 and Total Amount. Within the Main () Method Create the Objects Amount1, Amount2. Make Use of the Operator Overloading Method to Compute the Total Amount.

3. Create Student Personal Details using Windows Application.

4. Develop a Standard Calculator Widget using W indows Form.

5. Create a Library Book Details Form and using Menu Items Add Edit And Delete the Book Details using Dialog Boxes in windows Forms.

6. Create a Student Details Database. Use Dataset with a Datagridview Control to Display the Student's Details in Windows Forms.

7. Create an ASP.NET Application t o Get a User Name and Store It Session Information. W rite an Application to Retrieve the User Name Stored in Session.

8. Create a Simple Database Component Using ASP.NET.

9. Develop a .NET Application to Read and Write XML Data.

10. Develop a W eb Service.

Total : 30 Periods

Course Outcomes: On Completion of this course, the student will be able to
1. *Implement overloading concept for calculating total amount.*
2. *Develop a standard calculate widget using windows form.*
3. *Perform student database in windows form and develop ASP .NET application.*
4. *Develop simple database components using ASP .NET.*
5. *Illustrate the concept of web services.*

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018

SEMESTER - IV

CA18412	OBJECT ORIENTED ANALYSIS AND DESIGN	L	T	P	C
		3	2	0	3

Prerequisite: System Analysis and Design

Objectives:
1. *To learn the basic principles of objects and object oriented system development life cycle.*
2. *Learn to apply the unified modeling language (UML) to elementary object- oriented analysis and design concepts.*
3. *Knowing he object oriented analysis process.*
4. *Effectively use system requirements to drive the development of a robust design model.*
5. *Showing how implementation & storage details of a system can be modeled.*

UNIT - I   INTRODUCTION   [9]

An Overview of Object Oriented Systems Development – Object basics: Object State and Properties – Object Behavior & Methods – Messages – Data Abstraction - Encapsulation– Class Hierarchy – Object   Relationships & Associations – Aggregation – Identity – Dynamic Binding – Persistence – Object Oriented System Development Life Cycle

UNIT - II   METHODOLOGIES AND UML   [9]

Introduction –Modeling Technique: Rumbaing, Booch, Jacobson Methods – Patterns – Frameworks – Unified Approach – Unified Modeling Language: Static and Dynamic Models – UML Diagrams – Class Diagram – Use Case Diagrams – Case Study of Dynamic modeling.

UNIT - III   OBJECT ORIENTED ANALYSIS PROCESS   [9]

Identifying Use Case: Business Object Analysis – Use Case Driven Object Oriented Analysis – Use Case Model – Documentation – Classification – Identifying Object- Relationships- Attributes and Methods – Super– Sub Class – Case Study of Analysis Process

UNIT - IV   OBJECT ORIENTED DESIGN PROCESS   [9]

Design Process – Designing Classes: Class Visibility – Refining Attributes – Methods and Protocols – Packaging and Managing – Designing Interface Objects: Macro and Micro Level Processes – Case Study of Design Process.

UNIT - V   CODING AND TESTING   [9]

Mapping design to code – Testing: Issues in OO Testing – Class Testing – OO Integration Testing – GUI Testing – OO System Testing.

Total = 45 Periods

Course Outcomes: *On Completion of this course, the student will be able to*
1. *Recognizing the object state and properties, object behavior & methods and messages.*
2. *Discuss about the modeling technique: rumbaing, booch, jacobson methods.*
3. *Appraise use case driven object oriented analysis and use case model.*
4. *Identify the class visibility, refining attributes, methods and protocols.*
5. *Compare objects oriented databases vs. traditional databases.*

Text Book :

1   Ali Bahrami, "Object Oriented System Development", McGraw Hill International Edition, 2014

Reference Books :

1   Craig L, "Applying UML and Patterns", 3rd Edition, Pearson, 2009.

2   Grady B, James R, Ivar J, "The Unified Modeling Language User Guide", Addison Wesley Long man,4thEd.2008.

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018

SEMESTER –IV

CA18423   CASE TOOLS LAB

L	T	P	C
0	0	3	2

Prerequisite: Software Engineering

Objectives:
1. *To highlight the importance of object-oriented analysis and design and its limitations*
2. *To show how we apply the process of object-oriented analysis and design to software development*
3. *To point out the importance and function of each UML model throughout the process of object-oriented analysis and   design and explaining the notation of various elements in these models*
4. *To provide the necessary knowledge and skills in using object-oriented CASE tools*

LIST OF EXPERIMENTS

1. To develop a problem statement and Statement of Work.

2. Develop an IEEE standard SRS document. Also develop risk management and project plan (Gantt chart).

3. Identify Use Cases and develop the Use Case model.

4. Identify the business activities and develop an UML Activity diagram

5. Identity the conceptual classes and develop a domain model with UML Class diagram.

6. Using the identified scenarios find the interaction between objects and represent those using UML Interaction
    Diagrams.

7. Draw the State Chart diagram.

8. Identify the User Interface, Domain objects, and Technical services. Draw the partial layered, logical
    architecture Diagram with UML package diagram notation and patterns

9. Draw Component and Deployment diagrams.

10. Practice forward engineering and reverse engineering

Total : 30 Periods

Course Outcomes: On Completion of this course, the student will be able to
1. *Construct various UML models (including use case diagrams, class diagrams, interaction diagrams, state chart diagrams, activity diagrams, and implementation diagrams) using the appropriate notation using the Rational Software Suite*
2. *Recognize the role and function of each UML model in developing object-oriented software*
3. *Work with object oriented CASE tools*

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018

SEMESTER - IV

		L	T	P	C
CA18413	WEB TECHNOLOGY	3	0	0	3

Prerequisite: JAVA Programming

Objectives:
1. *To learn basics of web designing.*
2. *To know about dynamic webpage creation.*
3. *To gain the knowledge of bean programming.*
4. *To learn about server side programming.*
5. *To study about web technology.*

UNIT - I   HTML & XML   [9]

HTML- Forms, Frames, Tables, Simple Web Page Design, Introduction to XML-XML Versus HTML, Electronic Data Interchange(EDI),XML Terminology, Introduction to Document Type Declaration (DTD), Element Type Declaration Attribute Declaration, Limitation of DTDs, Introduction to Schema, Complex Types, Extensible Style Sheet Language Transformations.

UNIT - II   DYNAMIC HTML   [9]

Dynamic HTML – Cascading Style Sheet, Java Script –Introduction, Control Structure, Functions, Arrays, Standard Objects, Event Model, Simple Web Page Design.

UNIT - III   BEAN PROGRAMMING   [9]

Java Bean - Introduction, Advantages of Java Beans, Introspection, Bound and Constrained Properties, Persistence, Customizers, The Java Bean API, A Bean Example.

UNIT - IV   SERVER SIDE PROGRAMMING   [9]

Introduction to Java Servlet and JSP, Creating and Testing Servlets, Servlet Examples, Session Management.

UNIT - V   JAVA WEB TECHNOLOGIES   [9]

Introduction to JSP, JSP and JDBC, Apache Struts, Java Server Faces (JSF), Enterprise Java Bean (EJB), EJB Architecture-Overview, Types of EJB, Session Bean, JNDI Lookup.

Total = 45 Periods

Course Outcomes: *On Completion of this course, the student will be able to*
1. *Implement the concept of HTML and design a web page using HTML.*
2. *Demonstrate the java script program using CSS Window and document objects and their properties.*
3. *Know the concept of java swing and java bean.*
4. *Demonstrate the servlets to invoke data from HTML forms using Java.*
5. *Know the concept of EJB components.*

Text Books :
1. *Achyut S G & Atul K,"WebTechnologies-TCP/IP,Web/JavaProgramming,&Cloud Computing"3rded,9th reprint 2013.*
2. *Herbert Schildt, "JavaTM: The Complete Reference", 11th Edition, Oracle Press, Tata McGraw Hill, 2014*

Reference Books :

1   Deital & Deital, Internet and World Wide Web – How to program, Pearson, 2011

2   Margaret Levine Young and Doug Muder,"Internet:The Complete Reference" 1st Ed,Tata Mcgrawhill, 2011.

3   Kogent, "Java 6 Programming Black Book" Edition 2011, Kogent Learning Solution.

K.S.R. COLLEGE OF ENGINEERING (Autonomous)　　　　　　　R 2018

SEMESTER –IV

CA18422　　　　　　　WEB TECHNOLOGY LAB

L	T	P	C
0	0	3	2

Prerequisite: JAVA Programming Lab

Objectives:
1. *To Design effective WebPages.*
2. *To create dynamic WebPages using DHTML.*
3. *Create applications using advanced java tools.*

LIST OF EXPERIMENTS

1. Create a Web Page Using HTML.

2. Create a Interactive Web Page using HTML and CSS..

3. Design a XML Document to Store Information About a Student In a College. The Information Must Include Register　Number. Name, Name of the College, Branch, Year of Joining and E-Mail Id. Make Up Simple Data for Three Students. Create a CSS Style Sheet and Use It To Display the Document.

4. Create an XML Document, wh ic h contains 10 user information. Implement a Program, which takes Userid as an Input and Returns The u ser d etails by taking the u ser Information from XML Document.

5. Create a Web Page with all types of Cascading Style Sheets using our College Information.

6. Client Side Scripts for Validating Web Form Controls Using DHTML.

7. Create a Java Bean to draw various Graphical Shapes and Display it using BDK.

8. Patient Information System: This Software can be used to keep track of the Patients' Information and Treatment Details in a Hospital or Clinic. using JSP, Servlet & JDBC.

9. Write a Program Java to Create Three-Tier Applications using JSP and Database for Conducting On-Line Examination for Displaying Student Mark List. Assume that Student Information is available in a Database which has been stored i n a Database Server.

10. Write a Program to Implement Banking Operation using EJB.

Total : 30 Periods

Course Outcomes: On Completion of this course, the student will be able to
1. *Demonstrate the Java program for socket using HTTP.*
2. *Design a XML document to store information about a student in a college.*
3. *Illustrate a web page with all types of cascading style sheets using our college information.*
4. *Perform a java bean to draw various graphical shapes and display it using BDK.*
5. *Design a program to implement banking operation using EJB.*

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018

<u>SEMESTER - IV</u>

		L	T	P	C
HR18042	CAREER BUILDING SKILLS – II	0	2	0	0

Prerequisite: Career Building Skills – I

Objectives:
1. *To inculcate people skills, time management and to enhance employability.*
2. *To enhance arithmetical & analytical ability.*

UNIT - I   INTERVIEW & GD   **[04]**

Interview Handling Skills – Self Preparation Checklist – Grooming Tips: Do's & Don'ts – Mock Interview & Feedback, GD Skills – Understanding the Objective and Skills Tested in a GD – General types of Gds – Roles in a GD – Do's & Don'ts – Mock GD & Feedback.

UNIT - II   PRESENTATION SKILLS   **[05]**

Presentation Skills – Stages Involved in an Effective Presentation – Selection of Topic, Content, Aids – Engaging the Audience – Time Management – Mock Presentations & Feedback.

UNIT - III   BUSINESS ETHICS   **[07]**

Grooming Etiquette – Telephone & E-Mail Etiquette – Dining Etiquette – Do's & Don'ts in a Formal Setting – How to Impress. Ethics – Importance of Ethics and Values – Choices and Dilemmas Faced – Discussions From News Headlines.

UNIT - IV   QUANTITATIVE APTITUDE II   **[07]**

Areas – Volumes – Heights & Distances – Partnerships & Shares – Chain Rule – Allegation & Mixtures – Time & Work – Pipes & Cisterns, Time and Distance, Problems on Trains.

UNIT - V   REASONING II   **[07]**

Blood Relations – Series Completion – Venn Diagrams – Direction Sense Test– Verbal Reasoning -1.

Total = 30 Periods

Course Outcomes: *On Completion of this course, the student will be able to*
1. *Student compete quantitative aptitude and they can manage time and stress.*

Text Book :

1. Jeff Butterfield, Soft Skills for Everyone, Cengage Learning India Pvt Ltd, New Delhi, 2011 edition.

Reference Books :

1. E.Suresh Kumar, P.Srihari & J.Savithri – Communication Skills and Soft Skills: An Integrated Approach, 2011 ed., Pearson New Delhi.

2. Abhijit Guha, Quantitative Aptitude for Competitive Examinations, , 4th edition, TMH

3. Bhatnagar Nitin Communicative English for Engineers and Professionals,2010 ed of Pearson Publication,Delhi.

4. V.Sasikumar, P.Kiranmai Dutt & Geetha Rajeevan,Listening&Speaking,Reprint 2007 Pearson Education, Delhi.

5. R.V.Praveen, Quantitative Aptitude and Reasoning, PHI.

6. R.S.Agarwal, Quantitative Aptitude, 3rd edition,TMH.

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018

SEMESTER - IV

			L	T	P	C
MA18461	OPERATIONS RESEARCH [ELECTIVE]		3	0	0	3

Prerequisite:

Objectives:
1. *To learn about the optimization techniques for decision making problem in engineering fields.*
2. *To know the concepts of transportation and assignment problems.*
3. *To study the concepts of project scheduling by network analysis.*
4. *To enumerate the concepts in stock control models.*
5. *To know the concepts of scheduling and replacement problems in mechanical engineering.*

UNIT - I   LINEAR PROGRAMMING PROBLEMS   [9]

Introduction – Scope and role of OR – Phases of OR – Limitations of OR – Linear Programming Problem – Formulation of Linear Programming Problem – Optimum Solution by Graphical Method – Simplex Method (Using Slack Variables).

UNIT - II   TRANSPORTATION AND ASSIGNMENT PROBLEMS   [9]

Transportation Models (Minimizing and Maximizing Cases) - Balanced and Unbalanced Cases – Initial Basic Feasible Solution by North West Corner Rule, Least Cost and Vogel's Approximation Methods. Check for Optimality by Modified Method Assignment Models (Minimizing and Maximizing Cases) – Balanced and Unbalanced Cases – Solution by Hungarian Method. Travelling Salesman Problem.

UNIT - III   NETWORK MODELS   [9]

Network – Fulkerson's Rule – Construction of a Network – Critical Path Method (CPM) – Optimistic, Pessimistic and Most Likely Time Estimates – Project Scheduling by PERT Analysis.

UNIT - IV   INVENTORY MODEL   [9]

Types of Inventory – Deterministic Inventory Models – EOQ and EBQ Models with and without Shortages – Quantity Discount Models - Price Breaks – Probabilistic Inventory Model.

UNIT - V   REPLACEMENT MODELS AND SEQUENCING   [9]

Replacement of items that Deteriorate with Time – Value of Money Changing with Time – Not Changing with Time – Optimum Replacement Policy – Individual and Group Replacement. Sequencing Problem – Assumptions – Processing of 'n' Jobs in 2 Machines 'n' Jobs with 'm' Machines

                                                                    Total : 45 Periods

Course Outcomes: *On Completion of this course, the student will be able to*
1. *Develop the decision making during the uncertain situations by linear programming approach.*
2. *Identify to minimize the transportation and assignment cost and maximizes the profit in industries.*
3. *Develop the network techniques in project scheduling.*
4. *Study the importance of stock controlling to maximize the profit.*
5. *Know and apply the replacement and sequencing methods in manufacturing engineering.*

Text Book :

1   P.K.Gupta and Man Mohan "Problems in Operations Research:, S.Chand and Co,12th edition,2014

Reference Books :

1   Hira and Gupta "Problems in Operations Research", S. Chand and Co,2002.

2   Wayne.L.Winston, Operations research applications and algorithms",Thomson learning,4th edition 2007.

3   Taha H.A," Operation Research", Pearson Education sixth edition,2003

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018

SEMESTER - IV

		L	T	P	C
CA18462	TCP/IP [ELECTIVE]	3	0	0	3

Prerequisite: Computer Network

Objectives:

1. *In-depth study of TCP/IP 5 layers. Topics include internet protocols (IPv4, IPv6, ICMP), addressing (ARP), auto- configuration (DHCP), transport control protocols (TCP), User Datagram Protocol (UDP), Domain Name Services (DNS), end-to-end services.*

UNIT - I   INTRODUCTION   [9]

History –Standards – Internet –- OSI model – Protocol suite – Addressing – Transmission Media – Local Area and Wide Area Networks – Switching – Connecting devices – IP Addressing

UNIT - II   INTERNET PROTOCOL   [9]

Subnetting – Super netting – IP Packets – Delivery and Forwarding of IP Packets –Datagram – Fragmentation – Options- Checksum – ARP –RARP-Internet Control Message Protocol – Internet Group Management Protocol.

UNIT - III   TCP & UDP   [9]

TCP Services –Features-Segmentation-TCP Connection-State Transition Diagram-Windows in TCP-Flow control – Error Control – Congestion Control –Timers-Package-User Datagram protocol – Services-Applications-Package

UNIT - IV   APPLICATION LAYER AND CLIENT SERVER MODEL   [9]

Concurrency – BOOTP – DHCP – Domain Name System – Name Space – Distribution – Resolution – Messages – Telnet – Rlogin –Network Virtual Terminal – Character Set – Controlling the Server – Remote Login.

UNIT - V   APPLICATION PROTOCOLS   [9]

File Transfer Protocol – Connections – Communication – Simple Mail Transfer Protocol – Simple Network Management Protocol – Hyper Text Transfer Protocol – Transaction – Request and Response messages.

Total : 45 Periods

Course Outcomes: *On Completion of this course, the student will be able to*

1. *Recognizing the network components, categories, topology and IP address and compare the ISO/OSI model with TCP/IP protocol suite.*
2. *Discuss about the functionality of various internet protocols and gain the knowledge of the different routing protocols and algorithms.*
3. *Appraise User datagram and transmission control protocols.*
4. *Gain the knowledge of congestion control and QOS techniques and purpose of DNS and client - server model.*
5. *Compare HTTP, HTTPs and FTP in world wide web*

Text Book :

1   Behrouz A. Forouzan, "TCP/IP Protocol Suite", Tata McGraw Hill Edition, 2010.

Reference Books :

1   Douglas E. Comer, David L. Stevens, "Internetworking with TCP/IP – Volume I,II III", PHI Pvt. Ltd., 2nd Ed. 2005.

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018
SEMESTER - IV

| CA18463 | UNIX AND NETWORK PROGRAMMING [ELECTIVE] | L 3 | T 0 | P 0 | C 3 |

Prerequisite: Operating System

Objectives:
1. *To study about concept of processes in UNIX operating systems*
2. *To learn different forms of synchronization between processes*
3. *To perform TCP and UDP communication in UNIX operating system*
4. *To learn the applications of client server communications*

UNIT - I   INTRODUCTION & FILE SYSTEM   [9]
Overview of UNIX OS - File I/O – File Descriptors – File Sharing - Files and Directories – File Types - File Access Permissions – File Systems – Symbolic Links - Standard I/O library – Streams and File Objects – Buffering - System Data Files and Information - Password File – Group File – Login Accounting – System Identification.

UNIT - II   PROCESSES   [9]

Environment of a UNIX Process – Process Termination – Command Line Arguments – Process Control – Process Identifiers - Process Relationships Terminal Logins – Signals –Threads

UNIT - III   INTER PROCESS COMMUNICATION   [9]

Introduction - Message Passing (SVR4)- Pipes – FIFO – Message Queues - Synchronization(SVR4) – Mutexes – Condition Variables – Read – Write Locks – File Locking – Record Locking –Semaphores –Shared Memory(SVR4).

UNIT - IV   SOCKETS   [9]

Introduction – Transport Layer – Socket Introduction - TCP Sockets – UDP Sockets - Raw Sockets – Socket Options - I/O Multiplexing - Name and Address Conversions

UNIT - V   APPLICATIONS   [9]
Debugging Techniques - TCP Echo Client Server - UDP Echo Client Server - Ping - Trace Route - Client Server Applications Like File Transfer and Chat.

Total : 45 Periods

Course Outcomes: *On Completion of this course, the student will be able to*
1. *Compare the system calls and library functions, different types of files and access permissions.*
2. *Creation of parent and child process and gain the knowledge of the signals and threads.*
3. *Identify the purpose of inter process communication system and locking procedure.*
4. *Recognizing the different multiplexing techniques.*
5. *Appraise the TCP, UDP sockets and raw sockets.*

Text Book :

1   W.Richard Stevens, Advanced programming in the UNIX environment, Addison Wesley, 2012.(Unit 1,2 &3).

Reference Books :

1   W.Stevens, Bill F,A R,"Unix Network Programming",V1,TheSockets Networking API,3rdEd.,PE,Nov 2007(4&5).

2   Meeta G, Tilak S and Rajiv S The 'C' Odyssey Unix –The open Boundless C ,1st Ed ,BPB Publications1992

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018

<u>SEMESTER - IV</u>

CA18464	DATA SCIENCE & BIG DATA TECHNOLOGY	L T P C
		3 0 0 3

Prerequisite: Cloud Computing

Objectives:
1. *To learn the basics of Big Data.*
2. *To learn the Technology and foundations.*
3. *To Exposed with Databases.*
4. *To understand the different ways of Data Analytics.*
5. *To understand Big Data Implementation and Real world.*

UNIT - I   GETTING STARTED WITH BIG DATA   [9]

Grasping the fundamentals of big data -Evolution of Data Management-Understanding the waves of Managing Data-Defining big data-Building a successful big data Management architecture, Examining Big Data Types-Defining Structured data-unstructured-Looking at real and non-real time requirements-Putting big data together, Old Meets New :Distributed Computing-history of distributed computing-Understanding the basic of Distributed Computing

UNIT - II   TECHNOLOGY FOUNDATIONS FOR BIG DATA   [9]

Digging into a big data Technology Components, Virtualization and how it supports distributed computing – Understanding   the basics of virtualization – Managing virtualization with hypervisor - abstraction and virtualization, Examining the Cloud and Big data.

UNIT - III   BIG DATA MANAGEMENT   [9]

Operational Databases-Key value pair databases -document databases -Columnar databases -Graph Databases -spatial Databases, Map Reduce Fundamentals-Tracing the origins of map reduce-Putting map and reduce Together, The Hadoop Foundation and Ecosystem.

UNIT - IV   ANALYTICS AND IMPLEMENTATION   [9]

Defining Big Data analytics –Understanding Text Analytics and big data- Text analytics Tools for Big data, dealing with real time data streams and complex processing-Security and Governance for Big Data Environments-Security in context with big data-Data Governance challenge-putting the right organizational structure in place.

UNIT - V   BIG DATA SOLUTIONS IN THE REAL WORLD   [9]

The Importance of Big Data to business-Big Data as a Business Planning Tool-Adding New Dimensions to the Planning cycle, Analyzing data in motion-Real world view-Streaming data with an Environmental Impact-Streaming data in the energy industry, Improving business processing with big data analytics :Real World View.

                                                                        Total : 45 Periods

Course Outcomes: *On Completion of this course, the student will be able to*
1. *Apply the Analytics methods.*
2. *Compare and contrast various computing.*
3. *Design distributed file systems.*
4. *Apply stream data model.*
5. *Use Techniques in Real World.*

Text Book :

1   Big Data for Dummies A wiley Brand", Judith Hurwitz, Alan Nugent, Dr.Fern Halper, Marcia Kaufman,Reprint: 2014.

Reference Books :

1   Anand Rajaraman and Jeffrey David Ullman, Mining of Massive Datasets, Cambridge University Press, 2012.

2   Bill Franks, Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with advanced analytics, John   Wiley & sons, 2012.

3   Glenn J. Myatt, Making Sense of Data, John Wiley & Sons, 2007 Pete Warden, Big Data Glossary, O"Reilly, 2011

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018

<u>SEMESTER - IV</u>

CA18465	MIDDLEWARE TECHNOLOGY [ELECTIVE]	L	T	P	C
		3	0	0	3

Prerequisite: Client-Server Technology

Objectives:
1. *To introduce the concepts, techniques and applications of middleware technology.*
2. *To know middleware components like COM, CORBA and EJB.*
3. *.To integrate COM wit CORBA*

UNIT - I   INTRODUCTION CLIENT / SERVER & MIDDLEWARE TECHNOLOGY   [9]

Client / Server- Server Types- Middleware – Client, Server and Operating System-Introduction to Distributed Object Technology-Middleware – Client/Server Building Blocks – Peer-to Peer Communications–RPC-Messaging-Java RMI-Overview of CORBA and DCOM.

UNIT - II   EJB ARCHITECTURE   [9]

EJB – EJB Architecture – Overview of EJB Software Architecture – View of EJB –Conversation – Building and Deploying EJBs – Roles in EJB.

UNIT - III   EJB APPLICATIONS   [9]

Types of Enterprise beans –Lifecycle of Beans-Steps in Developing an application using EJB Framework, EJB Deployment-EJB Session Beans – EJB Entity Beans – EJB Clients – Building an Application with EJB.

UNIT - IV   CORBA   [9]

Introduction and Concepts-CORBA Components-Architectural Features-Method Invocations-Static and Dynamic CORBA-Structure of CORBA IDL-Self Describing Data types-Building an application using CORBA-Advanced CORBA-CORBA Object Service-Object Location Service-Message Service-CORBA Component Model.

UNIT - V   COM   [9]

Evolution of DCOM, COM Client and Server, COM IDL, COM Interface-COM threading Model, Marshalling, Comparision of RMI, CORBA and DCOM.Programming Examples of RMI, CORBA and DCOM.

Total : 45 Periods

Course Outcomes: *On Completion of this course, the student will be able to*
1. *Recognize the client / server concepts.*
2. *Obtain the knowledge of EJB.*
3. *Built EJB application for any one concept.*
4. *Describe the concept of CORBA services and models.*
5. *To know the concept of COM and DCOM.*

Text Book :

1   Robert O, Dan H & Jeri E, "The Essential Client / Server Survival Guide", Golgotha Publications Pvt. Ltd., 2014.

2   G.Sudha Sadasivam, Radha Shankarmani,"Middleware &Enterprise Integration Technologies." 2010.

Reference Books :

1   Chris Britton and Peter Eye, "IT Architecture and Middleware", Pearson Education, 2 Edition, 2004.

2   Wolfgang Emmerich, "Engineering Distributed Objects", John Wiley, 2000.

3   Michah L, "Middleware Networks: Concept, Design and Deployment of Internet Infrastructure", Kluwer, 2000.

K.S.R. COLLEGE OF ENGINEERING (Autonomous)　　　　　R 2018
<u>SEMESTER - IV</u>

		L	T	P	C
CA18466	SUPPLY CHAIN MANAGEMENT [ELECTIVE]	3	0	0	3

Prerequisite: Accounting and Financial Management

Objectives:
1. *Understand how supply chain strategy can provide a competitive advantage for organizations analyze the balance between customer satisfaction level and inventory management policies leverage supplier and distributor capabilities within value generating business processes apply information systems to support collaboration and visibility of supply chains.*

UNIT - I　　　INTRODUCTION　　　　　　　　　　　　　　　　[9]

Supply Chain – Fundamentals, Importance, Decision Phases, Process View- Supplier-Manufacturer-Cluster Chain-Drivers of Supply Chain Performance-Structuring Supply Chain Drivers-Overview of Supply Chain Models and Modeling Systems.

UNIT - II　　　STRATEGIC SOURCING　　　　　　　　　　　　[9]

In-Sourcing and Out-sourcing – Types of Purchasing Strategies-Supplier Evaluation, Selection and Measurement-Supplier Quality Management-Creating a Word Class Supply Base-World Wide Sourcing.

UNIT - III　　　SUPPLY CHAIN NETWORK　　　　　　　　　　[9]

Distribution Network Design – Role, Factors Influencing, Options, Value Addition-Models for Facility Location and Capacity Location-Impact of Uncertainty on Network Design-Network Design Decision Trees-Distribution Center Location Models-Supply Chain Network Optimization Models.

UNIT - IV　　　PLANNING DEMAND,INVENTORY AND SUPPLY　　　[9]

Overview of Demand Forecasting in the Supply Chain-Aggregate Planning in the Supply Chain-Managing Predictable Variability-Managing Supply Chain Cycle Inventory-Uncertainty in the Supply Chain – Safety Inventory-Determination of Optimal Level of Product Availability-Coordination in the Supply Chain.

UNIT - V　　　CURRENT TRENDS　　　　　　　　　　　　　　[9]

E-Business – Framework and Role of Supply Chain in E-Business and b2b Practices-Supply Chain IT Framework-Internal Supply Chain management-Fundamentals of Transaction Management-Supply Chain in IT practice-Supplier Relationship Management-Information Systems development-Packages in Supply Chain –eSRM, eLRM, eSCM.Supply Base Management.

Total : 45 Periods

Course Outcomes: *On Completion of this course, the student will be able to*
1. *Understand the basic concept of supply chain management.*
2. *Obtain the knowledge about the supply chain strategy.*
3. *Discuss the knowledge about the supply chain network.*
4. *Analysis the balance between customer satisfaction levels.*
5. *Obtain the knowledge about the current trends of supply chain management.*

Text Book :

1　Sunil C and Peter M, Supply Chain Management-Strategy Planning and Operation,PE,3 nd Indian Reprint 2016.

2　Monczka et al., Purchasing and Supply Chain Management,Thonson Learning,2 edition Reprint,2002.

Reference Books :

1　Altekar Rahul V,Supply Chain Management-Concept and Cases,Prentice Hall India, 2005.

2　Shapiro Jeremy F,Modeling the Supply Chain,Thomson Learning,2 nd edition Reprint,2002 .

3　Ballou R H, Business Logistics and Supply Chain Management,Pearson Education,2nd edition Indian Reprint,2004.

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018

SEMESTER - IV

		L	T	P	C
MA18467	NUMERICAL METHODS	3	0	0	3

Prerequisite:

Objectives:
1. *To study the concepts and applications in solving polynomial and transcendental equations, simultaneous linear equations numerically and to acquire knowledge in interpolation techniques, numerical differentiation and integration*
2. *To understand the concepts of numerical solutions to ordinary differential equations and numerical solutions to boundary values problems*

UNIT - I   SOLUTION OF EQUATIONS AND EIGEN VALUE PROBLEMS   [9]

Solutions to polynomial and transcendental equations – Newton's method,Regula-falsi method – Solutions to simultaneous linear equations – Gauss Elimination method – Gauss Jorden method – Gauss-Seidel method-Eigen value of a matrix by power method

UNIT - II   INTERPOLATION AND APPROXIMATION   [9]

Newton's forward and backward difference interpolation techniques (equal intervals) – Lagrange's interpolation and Divided difference method (for unequal intervals)

UNIT - III   NUMERICAL DIFFERENTATION AND INTEGRATION   [9]

Numerical differentiation using Newton's forward and backward interpolation methods – Numerical integration by trapezoidal and Simpson's 1/3rd rules – Double integrals using trapezoidal rule

UNIT - IV   INITIAL VALUE PROBLEMS FOR ORDINAY DIFFERENTIAL EQUATIONS   [9]

Solving first order Differential Equations by Taylor series – Euler's and Modified Euler's Method – forth order Runga-Kutta Method – Milne's predictor and corrector method

UNIT - V   BOUNDARY VALUE PROBLEMS IN ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS   [9]

Solution of one dimensional heat equation by Bender – Schmidt and Crank – Nicolson method – Solution of One dimensional wave equation – Solution of two dimensional Poisson equations.

Total : 45 Periods

Course Outcomes: *On Completion of this course, the student will be able to*
1. *Solve polynomial transcendental equations and simultaneous linear equations numerically*
2. *Apply the interpolation techniques*
3. *Develop their skills in numerical differentiation and integration*
4. *Solve ordinary differential equations numerically*
5. *Apply the concepts of numerical solutions to boundary value problems*

Text Book :

1 Dr.B.S.Grawal "Numerical Methods in Engineering and Science",Khanna Publications,New Delhi, (2010) 9th Editions

Reference Books :

1 Sukhendu Dey and Shishir Gupta "Numerical Methods", Tata Mc Graw Hill Publishing Company (2013)

2 Dr.M.K.Venkataraman,"Numerical Methods in Science and Engineering",National Publishing Company (2012)

3 V.Geraid "Applied Numerical Analysis" Pearson Education,6th Edition (2012)

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018

SEMESTER - IV

CA18468   SOFTWARE PROJECT MANAGEMENT [ELECTIVE]

L	T	P	C
3	0	0	3

Prerequisite:

Objectives:
1. *To learn the basic idea about the software project management and it's planning activities.*
2. *To know about the project evaluation concepts and software estimation.*
3. *To get the role of software developers in getting exposure on software quality and risk management.*
4. *To be familiar with the project management process and its activities.*

UNIT - I   INTRODUCTION TO SOFTWARE PROJECT MANAGEMENT   [9]

Product Life Cycle: Introduction-Idea Generation-Prototype Development Phase-Alpha Phase- Beta Phase-Production Phase-Maintenance and Obsolescence Phase. Product Life Cycle Models: The Waterfall Model-The Prototyping Model-The Rapid Application Development (RAD) Model- Spiral Model and Its Variants. Process Models: The ISO-9001 Model-The Capability Maturity Model.

UNIT - II   SOFTWARE METRICS & SOFTWARE CONFIGURATION MANAGEMENT   [9]

Software Metrics: Introduction-The Metrics Roadmap-A Typical Metrics Strategy-What To Measure- Set Targets and Track Them-Understanding and Trying to Minimize Variability-Act on Data-People and Organizational Issues in Metrics Programs-Common Pitfalls to watch out for in Metrics Programs –Metrics Implementation Checklists and Tools. Software Configuration Management: Introduction-Definitions and Terminology-The Process and Activities of SCM-Configuration Status Accounting-Configuration Audit-Metrics in SCM-SCM Tools and Automation.

UNIT - III   SOFTWARE QUALITY ASSURANCE & RISK MANAGEMENT   [9]

Software Quality Assurance: Software Quality-Quality Important in Software-Quality Control and Quality Assurance-Cost and Benefits of Quality-Software Quality Analyst's Functions-Misconceptions about the SQA Role-Software Quality Assurance Tools- Organizational Structures-Profile of a Successful SQA-Measure of SQA Success-Pitfalls of SQA. Risk Management: Introduction- Risk Management and its important. Risk Management Cycle-Risk Identification-Risk Quantification-Risk Monitoring-Risk Mitigation-Practical Techniques and Metrics in Risk Management.

UNIT - IV   PROJECT MANAGEMENT PROCESS AND ACTIVITIES   [9]

Project Life Cycle: In-Stream Activities-Project Initiation: Activities During Project Initiation-Outputs, Quality Record and Project Initiation Phase-Interface to the Process Database. Project Planning and Tracking: Components of Project Planning and Tracking-Project Closure: Issues and Metrics for Project Closure.

UNIT - V   ENGINEERING ACITIVITIES IN PROJECTS   [9]

Estimation: Phases of Estimation-Estimation Methodology-Size Estimation Effort and Schedule Estimates. Project Management In Testing Phase- What Is Testing? – What are the Activities That Make Up Testing- Test Scheduling & Types of Tests- Project Management In the Maintenance Phase-Activities During the Maintenance Phase- Management Issues in the Maintenance Phase.

                                                                Total : 45 Periods

Course Outcomes: *On Completion of this course, the student will be able to*
1. *Recognize the process models, production phase and software Matrices.*
2. *Understand the concept of software configuration management.*
3. *Describe the concept of software quality assurance and risk management.*
4. *Analysis the concept of project management process.*
5. *Express the concept of software requirement activity in a project.*

Text Book :

1   Gopalaswamy Ramesh, "Managing Global Software Projects", Tata McGraw Hill, 2006

Reference Books :

1   Bob Hughes, Mikecotterell, Rajib Mall, "Software Project Management", Fifth Edition,Tata McGraw Hill, 2011.

2   Walker Royce, "Software Project Management", Pearson Education, 2005.

3   Pankoj Jalote, "Software Project Management in Practice", Pearson Education, 2002.

K.S.R. COLLEGE OF ENGINEERING (Autonomous)　　　　　R 2018

SEMESTER - IV

CA18469	ADVANCED OPERATING SYSTEMS [ELECTIVE]	L	T	P	C
		3	0	0	3

Prerequisite: Operating System

Objectives:
1. *To get a comprehensive knowledge of the architecture of distributed systems.*
2. *To understand the deadlock and their solutions in distributed environments,*
3. *To get the knowledge of failure recovery and fault tolerance, to know the security issues and protection mechanisms for distributed environments,*
4. *To learn multiprocessor operating systems*

UNIT - I　　　　DISTRIBUTED OPERATING SYSTEMS　　　　　　　　　　[9]

Architectures of Distributed Systems - System Architecture Types - Issues in Distributed Operating Systems - Communication Networks - Communication Primitives. Distributed Dead Lock Detection - Introduction - Deadlock Handling Strategies in Distributed Systems - Issues in Deadlock Detection and Resolution - Control Organizations for Distributed Deadlock Detection.

UNIT - II　　　　DISTRIBUTED RESOURCE MANAGEMENT　　　　　　　[9]

Distributed File Systems – Mechanisms for Building Distributed File Systems – Design Issues – Distributed Shared Memory – Design Issues : Distributed Scheduling – Issues in Load Distributing – Components of a Load Distributing Algorithm – Load Distributing Algorithms – Selecting a Suitable Load Sharing Algorithm – Requirements for Load Distributing.

UNIT - III　　　　FAILURE RECOVERY AND FAULT TOLERANCE　　　　[9]

Recovery – Basic Concepts – Classification of Failures – Backward and Forward Error Recovery – Backward-Error Recovery : Basic Approaches – Recovery in Concurrent Systems – Fault Tolerance – Issues – Atomic Actions and Committing – Commit Protocols – Non blocking Commit Protocols – Voting Protocol

UNIT - IV　　　　PROTECTION AND SECURITY　　　　　　　　　　　　[9]

Protection and Security -Preliminaries, The Access Matrix Model and its implementations.-Safety in Matrix Model-Advanced Models of Protection.

UNIT - V　　　　MULTIPROCESSOR OPERATING SYSTEMS　　　　　　[9]

Multiprocessor Operating Systems - Basic Multiprocessor System Architectures - Inter Connection Networks for Multiprocessor Systems - Caching - Hypercube Architecture - Structures of Multiprocessor Operating System- Operating System Design Issues.

Total : 45 Periods

Course Outcomes: *On Completion of this course, the student will be able to*
1. *Understand the concept distributed concept of distributed operating systems.*
2. *Know the concept of distributed file systems.*
3. *Analysis the concept of failure recovery.*
4. *Gain the knowledge about the protection.*
5. *Know the concept of multiprocessor operating systems.*

Text Book :

1　Mukesh Singhal, Niranjan G.Shivaratri, "Advanced concepts in operating systems: Distributed, Database and multiprocessor operating systems", Tata McGraw-Hill Edition 2007.

Reference Books :

1　Andrew S.Tanenbaum, "Modern operating system", PHI, 2003

2　Pradeep K.Sinha, "Distributed operating system-Concepts and design", PHI, 2003.

3　Andrew S.Tanenbaum, "Distributed operating system", Pearson education, 2003

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018

SEMESTER - IV

CA18470	E – LEARNING TECHNIQUES [ELECTIVE]	L T P C
		3 0 0 3

Prerequisite: E-Commerce

Objectives:
1. *To provides the deep knowledge about E-learning concepts and tools available which helps to improve the learning technology.*

UNIT - I   INTRODUCTION   [9]

What is E-Learning – E-Learning Evolution – Advantages and Disadvantages of E-Learning – Instructional Design Models for E-Learning – Applying User – Centered Design to E-Learning – Rapid E-Learning.

UNIT - II   KEEPING THE E-LEARNING STRATEGY FORWARD   [9]

Learning Strategy – Process for Developing the E- Learning Strategy- Doomed to Failure – Keeping Focused on the Strategy – Instructional Strategies for E-Learning.

UNIT - III   DELIVERING E-LEARNING & E-LEARNING EVALUATION   [9]

Delivering E-Learning – Instructional Game Characteristics – Educational Podcasting- Gaming at Work – Delivering E-Learning Synchronously – E-Learning Education – Four Levels of Evaluating Learning – Learning Analytics – Evaluation Models.

UNIT - IV   WEB STANDARDS   [9]

Resources for Guidance on Web Standards - Web Standards for Designers – Validators - W3C Keeping it Simple.

UNIT - V   E-LEARNING TOOLS   [9]

E-learning Tools – E-learning Authoring Tools – Wikis and E-Learning.

Total : 45 Periods

Course Outcomes: *On Completion of this course, the student will be able to*
1. *Understand the concept of e-leaning.*
2. *Know the concept of various learning strategies.*
3. *Express the concept of delivering e-learning.*
4. *Understand the concept of web standards for designing, valuators.*
5. *Obtain the knowledge about the e-leaning tools.*

Text Book :

1   The e-Learning Guild's Handbook of e-Learning Strategy Foreword by Marc Rosenberg Chapters by Kevin Moore, Frank Hanfland, Patti Shank, Lisa Young, Lance Dublin, Ryan Watkins, Michael Corry Bill Brandon, Editor sponsored by Compilation Copyright 2007 by The e-Learning .

2   E-Learning Concepts and Techniques by Bloomsburg University of Pennsylvania's Department of Instructional Technology students and guest authors.

Reference Books :

1   The Insider's Guide to Becoming a Rapid E-Learning Pro – Tom Kuhlmann.

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018

SEMESTER - IV

CA18471	SOFT COMPUTING [ELECTIVE]	L	T	P	C
		3	0	0	3

Prerequisite: Distributed Computing

Objectives:
1. *To learn the key aspects of soft computing and neural networks.*
2. *To learn the fuzzy logic components.*
3. *To gain insight onto neuro fuzzy modeling and control.*
4. *To gain knowledge in machine learning through support vector machine.*

UNIT - I   INTRODUCTION TO SOFT COMPUTING AND NEURAL NETWORKS   [9]

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

UNIT - II   GENETIC ALGORITHMS   [9]

Introduction to Genetic Algorithms (GA) – Applications of GA in Machine Learning - Machine Learning Approach to Knowledge Acquisition.

UNIT - III   NEURAL NETWORKS   [9]

Machine Learning using Neural Network, Adaptive Networks – Feed Forward Networks Supervised Learning Neural Networks – Radial Basis Function Networks -Reinforcement Learning – Unsupervised Learning Neural Networks – Adaptive Resonance Architectures – Advances in Neural networks.

UNIT - IV   FUZZY LOGIC   [9]

Fuzzy Sets – Operations on Fuzzy Sets – Fuzzy Relations – Membership Functions- Fuzzy Rules and Fuzzy Reasoning – Fuzzy Inference Systems – Fuzzy Expert Systems – Fuzzy Decision Making.

UNIT - V   NEURO-FUZZY MODELING   [9]

Adaptive Neuro-Fuzzy Inference Systems – Coactive Neuro-Fuzzy Modeling – Classification and Regression Trees – Data Clustering Algorithms – Rule Base Structure Identification – Neuro-Fuzzy Control.

Total : 45 Periods

Course Outcomes: *On Completion of this course, the student will be able to*
1. *Understand the concept of soft computing.*
2. *Discuss the concept of genetic algorithm.*
3. *State the concept of neural networks basic.*
4. *Know the concept of fuzzy modeling.*
5. *Gain the knowledge about the neuro-fuzzy modeling.*

Text Book :

1   Jyh-Shing Roger Jang, Chuen-Tsai Sun, Eiji Mizutani, "Neuro-Fuzzy and Soft Computing", PHI, 2012.

2   George J. Klir and Bo Yuan, "Fuzzy Sets and Fuzzy Logic-Theory and Applications",Prentice Hall,1995.

3   James A. Freeman & David M. Skapura, "Neural Networks Algorithms, Applications & Prg. Tech.", PE., 2003

Reference Books :

1   Mitchell Melanie, "An Introduction to Genetic Algorithm", Prentice Hall, 1998.

2   David E. Goldberg, "Genetic Algorithms in Search, Optimization and MachineLearning",AddisonWesley,1997.

3   S. N. Sivanandam, S. Sumathi and S. N. Deepa, "Introduction to FuzzyLogic using MATLAB", Springer, 2007.

4   S.N.Sivanandam • S.N.Deepa, "Introduction to Genetic Algorithms",Springer, 2007.

5   Jacek M. Zurada, "Introduction to Artificial Neural Systems", PWSPublishers, 1992.

			L	T	P	C
CA18472	DIGITAL IMAGE PROCESSING [ELECTIVE]		3	0	0	3

Prerequisite: Digital Fundamentals and Computer Organization
Objectives:
1. *To give the knowledge of effectively storing images.*
2. *To extract interesting patterns from an image.*
3. *To discriminate between different classes of images.*
4. *To give mathematical fundamentals for image processing.*
5. *To lead the confidence in developing image-processing applications.*

UNIT - I   FUNDAMENTALS OF IMAGE PROCESSING AND IMAGE TRANSFORMS   [9]

Introduction – Steps in Digital Image Processing – Image Sampling and Quantization – Basic Relationships Between Pixels – Color Fundamentals – File Formats – Image Transforms: DFT, DCT, Haar, SVD and KL- Introduction to Mat Lab Toolbox.

UNIT - II   IMAGE ENHANCEMENT AND IMAGE RESTORATION   [9]

Image Enhancement in the Spatial Domain: Basic Gray Level Transformations, Histogram Processing, Enhancement Using Arithmetic/Logic Operations, Spatial Filtering – Image Enhancement in the Frequency Domain: Frequency Domain Filters - Image Restoration: Model of Image Degradation/Restoration Process, Noise Models, Restoration by Spatial and Frequency Domain Filtering.

UNIT - III   MULTI RESOLUTION ANALYSIS AND IMAGE COMPRESSION   [9]

Multi Resolution Analysis: Image Pyramids – Multi Resolution Expansion – Wavelet Transforms. Image Compression: Fundamentals – Models – Elements of Information Theory – Error Free Compression – Lossy Compression – Compression Standards.

UNIT - IV   IMAGE SEGMENTATION AND DESCRIPTION   [9]

Image Segmentation: Detection of Discontinuities, Edge Linking and Boundary Detection, Thresholding, Region Based Segmentation, Basic Morphological Algorithms, Morphological Water Sheds - Description: Boundary Descriptors, Regional Descriptors.

UNIT - V   CURRENT TRENDS AND APPLICATIONS OF IMAGE PROCESSING   [9]

Applications: Image Classification, Object Recognition, Image Fusion, Steganography – Current Trends: Color Image Processing, Wavelets in Image Processing.

Total : 45 Periods

Course Outcomes: *On Completion of this course, the student will be able to*
1. *Understand the concept of fundamentals of image processing.*
2. *Know the concept of image enhancement in spatial domain.*
3. *Spot out the multi resolution and analysis the various techniques for image compression.*
4. *Study the concept of image segmentation.*
5. *Investigate the concept of current trends in image processing.*

Text Book :

1   S.Jayaraman, S.Esakkirajan and T.Veerakumar,"Digital Image Processing", McGraw Hill Edition, 2011.

2   Rafael C.Gonzalez and Richard E.Woods, "Digital Image Processing", Pearson Education,3rd Edition, 2008.

3   S. Sridhar, "Digital Image Processing", Oxford University Press, 2011.

Reference Books :

1   Milan S,Vaclav H&Roger B,"Image Processing,Analysis & Machine Vision",2nd Ed.Thomson Learning,2001.

2   Anil K.Jain, "Fundamentals of Digital Image Processing", PHI, 2006.

3   Sanjit K. Mitra, & Giovanni L. Sicuranza, "Non Linear Image Processing", Elsevier, 2007.

K.S.R. COLLEGE OF ENGINEERING (Autonomous)   R 2018

<u>SEMESTER - IV</u>

CA18473	**MOBILE COMPUTING [ELECTIVE]**	L T P C 3 0 0 3

Prerequisite: Distributed Computing

Objectives:
1. *To learn the basics of wireless voice and data communications technologies.*
2. *To build working knowledge on various telephone and satellite networks.*
3. *To study the working principles of wireless LAN and its standards.*
4. *To build knowledge on various mobile computing algorithms.*
5. *To build skills in working with wireless application protocols to develop mobile content applications.*

UNIT - I   WIRELESS COMMUNICATION FUNDAMENTALS   [9]

Introduction – Wireless Transmission – Frequencies for Radio Transmission – Signals – Antennas – Signal Propagation – Multiplexing – Modulations – Spread Spectrum – MAC – SDMA – FDMA – TDMA – CDMA – Cellular Wireless Networks.

UNIT - II   TELECOMMUNICATION SYSTEMS   [9]

GSM – System Architecture – Protocols – Connection Establishment – Handover – Security – GPRS, DECT.

UNIT - III   WIRELESS NETWORKS   [9]

Wireless LAN – IEEE 802.11 Standards – Architecture – Services – HIPERLAN – AdHoc Network – Blue Tooth.

UNIT - IV   NETWORK LAYER   [9]

Mobile IP – Dynamic Host Configuration Protocol – Routing – DSDV – DSR – AODV – ZRP – ODMR.

UNIT - V   TRANSPORT AND APPLICATION LAYERS   [9]

TCP Over Wireless Networks – Indirect TCP – Snooping TCP – Mobile TCP – Fast Retransmit / Fast Recovery – Transmission/Timeout Freezing – Selective Retransmission – Transaction Oriented TCP – WAP.

                                                                            Total : 45 Periods

Course Outcomes: *On Completion of this course, the student will be able to*
1. *Gain Knowledge in basics of radio transmission.*
2. *Describe second generation digital cellular network and its architecture.*
3. *Observe various WLAN products, its system and protocol architecture.*
4. *Identify the requirements of mobile IP for IPV4 and IPV6.*
5. *Acquire the knowledge of TCP for mobility*

Text Book :

1   Jochen Schiller, "Mobile Communications", 2nd , Prentice Hall of India / Pearson Education, 2nd Edition, 2011.

2   C.Sivaram murthy & B.S.Manoj, "Adhoc wireless Networks", Pearson Education, 2012.

Reference Books :

1   Kaveh Pahlavan, Prasanth Krishnamoorthy, "Principles of Wireless Networks", Pearson Education, 2003.

2   Uwe H, Lothar M, Martin S. Nicklons & Thomas S, "Principles of Mobile Computing", Springer, New York, 2003.

3   C.K.Toh, "AdHoc Mobile Wireless Networks", Prentice Hall Inc., 2002.

4   William Stallings, "Wireless Communications and Networks", 2nd Ed., PHI of India / Pearson Education, 2004.