

Dr. Mahalingam College of Engineering and Technology

(An Autonomous Institution)

Pollachi - 642003

Curriculum and Syllabus for MASTER OF COMPUTER APPLICATIONS SEMESTERS – I to IV REGULATIONS 2014




DR MAHALINGAM



COLLEGE OF ENGINEERING AND TECHNOLOGY

Enlightening Technical Minds

| |
|---|
| Programme : Master of Computer Applications |
| Curriculum and Syllabus : Semesters – I to IV |
| Approved by Academic Council on 3rd July 2015 |

| Action | Responsibility | Signature of Authorized Signatory |
|---------------------------|-------------------------------------|---|
| Designed and Developed by | BoS Master of Computer Applications |  |
| Compiled by | Office of COE |  |
| Approved by | Principal |  |

DEPARTMENT OF COMPUTER APPLICATIONS

2014 REGULATION


Curriculum for Master of Computer Applications from Semester I to VI

SEMESTER I

| Course code | Course title | Hours / week | | | Credits | Max marks 100 |
|-------------------|--|--------------|---|----|---------|------------------|
| | | L | T | P | | |
| THEORY COURSES | | | | | | |
| 140CA0101 | Mathematical Foundations of Computer Science | 3 | 1 | 0 | 4 | 100 |
| 140CA0102 | Problem Solving Techniques | 3 | 1 | 0 | 4 | 100 |
| 140CA0103 | Computer Organization | 3 | 0 | 0 | 3 | 100 |
| 140CA0104 | Programming in C | 3 | 0 | 0 | 3 | 100 |
| 140CA0105 | IT Essentials | 3 | 0 | 0 | 3 | 100 |
| PRACTICAL COURSES | | | | | | |
| 140CA0107 | Problem Solving and Programming Laboratory using C | 0 | 0 | 4 | 2 | 100 |
| 140CA0108 | Hardware & Trouble Shooting Laboratory | 0 | 0 | 4 | 2 | 100 |
| 140CA0109 | Communication Skills Laboratory | 0 | 0 | 4 | 2 | 100 |
| | TOTAL | 15 | 2 | 12 | 23 | 800 |

SEMESTER II

| Course code | Course title | Hours / week | | | Credits | Max marks 100 |
|-------------------|--|--------------|---|----|---------|------------------|
| | | L | T | P | | |
| THEORY COURSES | | | | | | |
| 140CA0201 | Resource Management Techniques | 3 | 1 | 0 | 4 | 100 |
| 140CA0202 | System Software | 3 | 0 | 0 | 3 | 100 |
| 140CA0203 | Object Oriented Programming | 3 | 1 | 0 | 4 | 100 |
| 140CA0204 | Human Values and Professional Ethics | 3 | 0 | 0 | 3 | 100 |
| 140CA0205 | Web Programming | 3 | 0 | 0 | 3 | 100 |
| PRACTICAL COURSES | | | | | | |
| 140CA0207 | Object Oriented Programming Laboratory | 0 | 0 | 4 | 2 | 100 |
| 140CA0208 | System Software Laboratory | 0 | 0 | 4 | 2 | 100 |
| 140CA0209 | Web Programming Laboratory | 0 | 0 | 4 | 2 | 100 |
| | TOTAL | 15 | 2 | 12 | 23 | 800 |



SEMESTER III

| Course code | Course title | Hours / week | | | Credits | Max marks 100 |
|-------------------|------------------------------|--------------|---|----|---------|---------------|
| | | L | T | P | | |
| THEORY COURSES | | | | | | |
| 140CA0301 | Operating Systems | 3 | 0 | 0 | 3 | 100 |
| 140CA0302 | Software Engineering | 3 | 0 | 0 | 3 | 100 |
| 140CA0303 | Java Programming | 3 | 0 | 0 | 3 | 100 |
| 140CA0304 | Data Structures & Algorithms | 3 | 1 | 0 | 4 | 100 |
| 140CA0305 | Database Management Systems | 3 | 1 | 0 | 4 | 100 |
| PRACTICAL COURSES | | | | | | |
| 140CA0307 | Java Programming Laboratory | 0 | 0 | 4 | 2 | 100 |
| 140CA0308 | Data Structures & Algorithms | 0 | 0 | 4 | 2 | 100 |
| 140CA0309 | DBMS Laboratory | 0 | 0 | 4 | 2 | 100 |
| | TOTAL | 15 | 2 | 12 | 23 | 800 |

SEMESTER IV

| Course code | Course title | Hours / week | | | Credits | Max marks 100 |
|-------------------|--|--------------|---|----|---------|------------------|
| | | L | T | P | | |
| THEORY COURSES | | | | | | |
| 140CA0401 | Computer Networks | 3 | 0 | 0 | 3 | 100 |
| 140CA0402 | Mobile Programming | 3 | 1 | 0 | 4 | 100 |
| 140CA0403 | Web Application Development | 3 | 1 | 0 | 4 | 100 |
| 140CA0404 | Elective – I | 3 | 0 | 0 | 3 | 100 |
| 140CA0405 | Elective – II | 3 | 0 | 0 | 3 | 100 |
| PRACTICAL COURSES | | | | | | |
| 140CA0407 | Mobile Programming Laboratory | 0 | 0 | 4 | 2 | 100 |
| 140CA0408 | Web Application Development Laboratory | 0 | 0 | 4 | 2 | 100 |
| 140CA0409 | Mini Project | 0 | 0 | 6 | 3 | 100 |
| | TOTAL | 15 | 2 | 14 | 24 | 800 |



SEMESTER V

| Course code | Course title | Hours / week | | | Credits | Max marks 100 |
|-------------------|-------------------------------------|--------------|---|---|---------|------------------|
| | | L | T | P | | |
| THEORY COURSES | | | | | | |
| 140CA0501 | Software Project Management | 3 | 0 | 0 | 3 | 100 |
| 140CA0502 | Cloud Computing | 3 | 0 | 0 | 3 | 100 |
| 140CA0503 | Big Data Analytics | 3 | 1 | 0 | 4 | 100 |
| 140CA0504 | Elective III | 3 | 0 | 0 | 3 | 100 |
| 140CA0505 | Elective IV | 3 | 0 | 0 | 3 | 100 |
| PRACTICAL COURSES | | | | | | |
| 140CA0507 | Software Testing Lab | 0 | 0 | 4 | 2 | 100 |
| 140CA0508 | Open Source Elective –IV Laboratory | 0 | 0 | 4 | 2 | 100 |
| | TOTAL | 15 | 2 | 8 | 20 | 700 |

SEMESTER VI

| Course code | Course title | Hours / week | | | Credits | Max marks 100 |
|-------------------|--------------|--------------|---|----|---------|------------------|
| | | L | T | P | | |
| PRACTICAL COURSES | | | | | | |
| 140CA0607 | Project Work | - | - | 24 | 12 | 400 |



SEMESTER – IV –LIST OF ELECTIVES

| Course code | Course title | Hours / week | | | Credits | Max marks 100 |
|-------------|-----------------------------------|--------------|---|---|---------|------------------|
| | | L | T | P | | |
| ELECTIVE I | | | | | | |
| 140CA9111 | Software Architecture | 3 | 0 | 0 | 3 | 100 |
| 140CA9112 | Design Patterns | 3 | 0 | 0 | 3 | 100 |
| 140CA9113 | Human Computer Interface | 3 | 0 | 0 | 3 | 100 |
| 140CA9114 | Cyber Security | 3 | 0 | 0 | 3 | 100 |
| 140CA9115 | Accounting & Financial Management | 3 | 0 | 0 | 3 | 100 |
| 140CA9116 | Data Mining & Data Warehousing | 3 | 0 | 0 | 3 | 100 |
| ELECTIVE II | | | | | | |
| 140CA9117 | Agile Software Development | 3 | 0 | 0 | 3 | 100 |
| 140CA9118 | UNIX & Networking Programming | 3 | 0 | 0 | 3 | 100 |
| 140CA9119 | Service Oriented Architecture | 3 | 0 | 0 | 3 | 100 |
| 140CA9120 | Virtualization Techniques | 3 | 0 | 0 | 3 | 100 |
| 140CA9121 | Health Care Management | 3 | 0 | 0 | 3 | 100 |

SEMESTER – V –LIST OF ELECTIVES

| Course code | Course title | Hours / week | | | Credits | Max marks 100 |
|---|---|--------------|---|---|---------|------------------|
| | | L | T | P | | |
| ELECTIVE III | | | | | | |
| 140CA9122 | Software Quality Assurance | 3 | 0 | 0 | 3 | 100 |
| 140CA9123 | Enterprise Application Integration | 3 | 0 | 0 | 3 | 100 |
| 140CA9124 | Business Intelligence | 3 | 0 | 0 | 3 | 100 |
| 140CA9125 | Social Network Analysis | 3 | 0 | 0 | 3 | 100 |
| 140CA9126 | Database Architecture & Administration | 3 | 0 | 0 | 3 | 100 |
| 140CA9127 * | Research Methodology | 3 | 0 | 0 | 3 | 100 |
| ELECTIVE IV OPEN SOURCE ELECTIVE –IV LABORATORY * | | | | | | |
| 140CA9128 | Software Testing Laboratory | 3 | 0 | 0 | 3 | 100 |
| 140CA9129 | Groovy & Grails Laboratory | 3 | 0 | 0 | 3 | 100 |
| 140CA9130 | PHP & MYSQL Laboratory | 3 | 0 | 0 | 3 | 100 |
| 140CA9131 | Perl & Python Programming Laboratory | 3 | 0 | 0 | 3 | 100 |
| 140CA9132 | Interactive Web Programming Laboratory | 3 | 0 | 0 | 3 | 100 |
| 140CA9133 | Android Application Laboratory | 3 | 0 | 0 | 3 | 100 |

*Elective IV Subject has their corresponding Laboratory

*For Research Scholars only



Category: General

Mode of Delivery: Lecture –3 Hrs/Week; Tutorial – 1 Hr/Week

Total hours: 60

Credit: 4

AIM:

Acquire the knowledge of mathematical foundation concepts to solve the real time problems in the field of Computer Science.

OBJECTIVES:

- ☐ Understand the basic concepts and operations of mathematics in the field of computer graphics.
- ☐ Understand and apply the functional theory concepts relating to input and output functions in computer science.
- ☐ Impart discrete knowledge through finite automata and Context free grammars in the design of a Compiler.

UNIT I MATRIX ALGEBRA

9+3

Matrices, Rank of Matrix, Solving System of Equations - Eigen values and Eigen Vectors - Inverse of a Matrix - Cayley Hamilton Theorem.

UNIT II BASIC SET THEORY

9+3

Basic Definitions- Venn Diagrams and set operations – Laws of set theory- Principles of inclusion and exclusion-Partitions-Permutation and Combination- Relations – Properties of relations –Matrices of relations –Closure operations on relations- Functions – injective, surjective and bijective functions.

UNIT III MATHEMATICAL LOGIC

9+3

Propositions and logical operators - Truth table - Propositions generated by a set, Equivalence and implication - Basic laws - Functionally complete set of connectives - Normal forms - Proofs in Propositional calculus - Predicate calculus.

UNIT IV DISCRETE PROBABILITY

9+3

Finite probability - Conditional probability - Independence – Bayes theorem-Mathematical expectation- Probability Distribution (Binomial, Poisson, Geometric and their Properties).

UNIT V FINITE AUTOMATA

9+3

Introduction to formal proof- Additional forms of proof- Inductive proofs- Finite Automata (FA)- Deterministic Finite Automata(DFA)-Non-deterministic Finite Automata(NFA)- Finite Automata with Epsilon transitions.

TEXT BOOKS:

1. Kenneth H. Rosen, Discrete Mathematics and its applications, Tata McGraw Hill, Fourth Edition, 2002.
2. Tremblay J P and Manohar, Discrete Mathematical Structures with Applications to Computer Science, TMH, 1997.

REFERENCE BOOKS:

1. M K Venkataraman, Engineering Mathematics Volume II, National Publishing company, Second Edition, 1989 .
2. J E Hopcroft, R Motwani and J D Ullman, Introduction to Automata Theory, Languages and Computations, Second Edition, Pearson Educations, 2003 .
3. Ross S, A First course in Probability Sixth edition, TMH, Delhi, 2002.



Category: General

Mode of Delivery: Lecture –3 Hrs/Week; Tutorial – 1 Hr/Week

Total hours: 60

Credit: 4

AIM:

Learn and apply the concepts of problem solving and make great decisions, and do a wide array of tasks in different kinds of problems.

OBJECTIVES:

- ☐ Explore skills to identify a problem and design appropriate solutions.
- ☐ Develop the ability to solve factoring methods & related problems.
- ☐ Understand the concept of Array & its related problems with applications.
- ☐ Develop the ability to perform sorting & searching.
- ☐ Explore the process of text editing & pattern matching.

UNIT I INTRODUCTION TO COMPUTER PROBLEM-SOLVING

9+3

Introduction – The Problem-solving Aspect - Top-down Design -implementation of Algorithms- Program Verification - The Efficiency of Algorithms. Fundamental Algorithms - Exchanging the values of Two Variables – Counting - Summation of a set of Numbers - Factorial Computation-Sine function computation - Generation of the Fibonacci sequence - Reversing the Digits of an Integer - Base Conversion- Character to Number Conversion.

UNIT II FACTORING METHODS

9+3

Finding the square Root of a number - The Smallest Divisor of an Integer – The Greatest Common Divisor of Two Integers - Generating Prime Numbers – Computing the Prime Factors of an Integer - Generation of Pseudo - random Numbers – Raising a Number to a Large Power - Computing the nth Fibonacci Number.

UNIT III ARRAY TECHNIQUES

9+3

Array Order Reversal-Array Counting or Histogramming - Finding the Maximum Number in a Set - Removal of Duplicates from an Ordered Array - Partitioning an Array - Finding the kth Smallest Element - Longest Monotone Subsequence.

UNIT IV SORTING AND SEARCHING

9+3

Sorting – Internal Sorting – Bubble Sort, Insertion Sort, Quick Sort, Heap Sort, Radix Sort – External Sorting – Merge Sort, Multi - way Merge Sort, Polyphase Sorting. Searching Techniques :Binary Search – Hash Searching.

UNIT V TEXT PROCESSING AND PATTERN SEARCHING

9+3

Text Line Length Adjustment - Left and Right Justification of Text – Keyword Searching in Text - Text Line editing - Linear Pattern Search - Sub linear Pattern Search.

TEXT BOOK:

1. R.G.Dromey, How to Solve it by Computer, Second Edition ,Pearson Education, India, 2008.

REFERENCE BOOKS:

1. Stephen G.Kochen, Programming in C: A Complete Introduction to the C Programming Language, Third Edition, Pearson Education, 2014.
2. Rajaram R, Chitra P, Problem Solving using C, Scitech Publication, 2001.



Category : Technical

Mode of Delivery: Lecture –3 Hrs/Week;

Total hours : 45

Credit :3

AIM:

This course aims to impart knowledge on the various aspects of computer organization of modern digital computer systems to the students.

OBJECTIVES:

- ☐ Illustrate the design principle of the various functional units of digital systems.
- ☐ Classify the memory and programmable logic
- ☐ Knowledge of Input–Output organization and Interrupts.
- ☐ Analyze instruction sets, addressing mode and instruction formats in digital computer.
- ☐ Fundamentals of multiple processors and multicore computers.

UNIT I NUMBER SYSTEMS AND BOOLEAN ALGEBRA

9

Number Systems and conversions — Complements - Binary Codes – Binary Logic – Basic theorems and properties of Boolean algebra – Boolean Functions – Canonical and Standard Forms – Gate level minimization.

UNIT II COMBINATIONAL AND SEQUENTIAL LOGIC

9

Combinational Circuits: Design procedure – Binary Adder & Subtractor – Decoders – Encoders - Multiplexers – Sequential Circuits – Latches - Flip Flops - Registers – Shift Registers – Ripple Counters.

UNIT III MEMORY AND INPUT/OUTPUT ORGANIZATION

9

Random Access Memory – Memory Decoding – error Detection and correction – Read only memory – Programmable Logic Array – Programmable Array Logic.

External Devices – Input/Output modules – Programmed I/O – Interrupt driven I/O - Direct Memory Access - Input/ Output Channels and Processors.

UNIT IV CPU ORGANIZATION

9

Instruction Sets: Characteristics and Functions – Machine Instruction Characteristics – Types of Operands – Intel x86 and ARM Data types – Types of Operations – Addressing Modes and Formats: Addressing – x86and ARM Addressing Modes – Instruction Formats - x86and ARM Instruction Formats - Processor organization – Register Organization – Instruction cycle.

UNIT V PARALLEL ORGANIZATION

9

Parallel Processing: Use of multiple processors – Symmetric multiprocessors – Cache Coherence and MESI protocol – Multithreading and Chip Multiprocessors – clusters. Multicore Computers: Hardware Performance Issues – software Performance issues – Multicore organization – Intel x86 multicore organization.

TEXT BOOKS:

1. M.Morris Mano,Michael D.Ciletti, Digital Design,Fourth Edition,Pearson Education, 2011.
(Unit I to III)
2. William Stallings, Computer Organization and Architecture, Eighth Edition, PHI, 2012.(Unit IV & V).

REFERENCE BOOKS:

1. David A Patterson; John L Hennessy, Computer Organization And Design The Hardware Software Interface, Fourth Edition ,Morgan Kaufmann Publishers, 2009.
2. Nicholas Carter ,Computer Architecture,Tata Mcgraw Hill Publishing Company Limited,2007.



Category: Technical

Mode of Delivery: Lecture –3 Hrs/Week;

Total hours: 45

Credit: 3

AIM:

Learn the concepts of programming and develop real time applications.

OBJECTIVES:

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

- ☐ Understand the differences between array and structure.
- ☐ Create custom applications using pointers.
- ☐ Develop custom applications using structure and union with file concepts.
- ☐ Design and implement real time applications.

UNIT I BASICS OF C LANGUAGE

9

Overview of C Language - Constants, Variables and Data Types - Operators, Expressions and Assignment statements - Managing Input/Output Operations - Formatted I/O - Decision Making - Branching - IF, Nested IF - Switch - goto - Looping- while, do, for statements.

UNIT II ARRAYS AND FUNCTIONS

9

Arrays - dynamic and multi-dimensional arrays - Character arrays and Strings - String handling Functions - User defined Functions - Categories of Functions - Recursion.

UNIT III STRUCTURES AND UNIONS

9

Basics of Structures-Declaring a Structure - Array of Structures- passing Structures elements to Functions - Passing entire Structure to Function - Structures within Structures - Union - Union of Structures - Enumerated Data Types - typedef Statement.

UNIT IV POINTERS

9

Pointers - Declaration - Accessing a variable - Dynamic memory allocation - Pointers versus Arrays- Array of pointers- Pointers to functions and structure Pointers.

UNIT V FILE MANAGEMENT

9

File Management in C - Data hierarchy- Files and Streams - Sequential access file- Random access file – Preprocessors.

TEXT BOOK:

1. Stephen G.Kochen, Programming in C: A Complete Introduction to the C Programming Language, Third Edition, Pearson Education, 2008.

REFERENCE BOOKS:

1. Al Kelley, Ira Pohl, A Book on C: Programming in C, Fourth Edition, Addison-Wesley Professional, 2010.
2. Yashavant P. Kanetkar Understanding Pointers in C, BPB Publications, New Delhi, 2009.
3. Byron C Gotfried, Programming with C, Schaums' Outline series, Second Edition, Tata McGraw Hill, 2006.
4. M.T. Somashekara, Programming in C, Prentice-Hall of India Pvt.Ltd, 2005.
5. Richard Johnsonbaugh, Applications Programming In ANSI C, Third edition, Pearson Education, 2003.



140CA0105 IT ESSENTIALS

Category: Technical

Mode of Delivery: Lecture –3 Hrs/Week;

Total hours: 45

Credit: 3

AIM:

The aim of this course is to impart the skills for assembling the systems with the help of hardware devices and software.

OBJECTIVES:

- Learning about the personal computers and internal components of a computer.
- Enlightening the overview of techniques involved in assembling the computers.
- Practical exposure of procedures needed for hardware and software installations, up gradation and troubleshooting systems

UNIT I THE PERSONAL COMPUTER

9

Introduction- Cases and Power Supplies-Internal PC Components-ROM and RAM -External Ports and Cables -Input and Output Devices -Selecting PC Components- Specialized Computer Systems- Lab Procedures and Tool Use- Safe Lab Procedures - Procedures to Protect Equipment and Data - Procedures to Protect the Environment -Proper Use of Tools

UNIT II COMPUTER ASSEMBLY

9

Open the Case and Install the Power Supply- Install the Motherboard - Install the Drives -Install the Adapter Cards - Install the Cables - POST and BIOS - BIOS Configuration - Motherboard and Related Components - Storage Devices - Input and Output Devices - Preventive Maintenance- Troubleshooting Process Steps.

UNIT III OPERATING SYSTEMS & NETWORKS

9

Modern Operating Systems- Types of Operating Systems - Operating System Installation- Custom Installation Options -Boot Sequence and Registry Files- Multiboot- Directory Structure and File Attributes - Windows GUI and Control Panel -Client-Side Virtualization.

Networks –Principles-Basic Networking Concepts and Technologies- Ports and Protocols-Physical Components- Cables and Connectors- Network Topologies- Ethernet Standards - OSI and TCP/IP Data Models-Wireless and Wired Router Configurations-OS Configurations- ISP

UNIT IV LAPTOPS & MOBILE DEVICES

9

Introduction-Laptop Components -Internal Components- Laptop Power - Laptop Wireless Communication Technologies- Laptop Hardware and Component Installation and Configuration- Replacing Hardware Devices

Mobile Devices-Mobile Device Hardware Mobile Operating Systems- Android Touch Interface -iOS Touch Interface- Network Connectivity and Email-Mobile Device Synchronization -Securing Mobile Devices-Cloud-Enabled Services for Smart Devices

UNIT V PRINTERS, SECURITY & TROUBLE SHOOTING

9

Introduction-Common Printer Features- Types of Printers- Installing and Configuring Printers - Configuring Options and Default Settings- Optimizing Printer Performance -Sharing Printers-Print Servers. Security Threats-Security Procedures-Security Maintenance-Applying Troubleshooting Process To Security- Troubleshooting Process to Computer Components- Peripherals- Operating Systems-Networks- Laptops- Security.

TEXT BOOK:

1. IT Essentials Course Booklet: PC Hardware and Software, Version 5.0, CISCO Press, 2013.

REFERENCE BOOK:

1. IT Essentials: PC Hardware and Software Companion Guide, Fifth Edition, CISCO Press, 2013.



140CA0107 PROBLEM SOLVING AND PROGRAMMING LABORATORY USING C

Category: Technical

Mode of Delivery: Practical –4 Hrs/Week;

Total hours: 45

Credit: 2

AIM:

Ability to design and implement of real time applications using C Programming language.

LIST OF EXPERIMENTS:

1. Program to create a switch case for numbers (0-9), convert numeric into string. The user can enter the sequence of numbers through command line argument. To read the input and convert into string and output is display in the following format.

| S.No. | Given Digit | Converted String |
|-------|-------------|----------------------|
| 1 | 343 | THREE FOUR THREE |
| 2 | 6785 | SIX SEVEN EIGHT FIVE |

(Concepts to be used: Switch Case, Functions and Command Line Arguments)

2. Program has to get the date from the user and to find the day for the given date.
 - a. Give the pre date to find the corresponding day
 - b. Give the post date to find the corresponding day

(Concepts to be used: Conditional Statement, Looping Statement and Functions)

3. Write a C program for searchable dictionary. First, create the dictionary file (which contains character-string, word & definition). Second, the program reads character-string, word and definition from dictionary file. Then, the user can type a character-string or word, and the program will search the dictionary, and assuming the character-string or word is found, outputs the definition. The program proceeds until the user choices to quit. The following reports to be printed:
 - a. Get the character-string, to display only matching words.
 - b. Get the array of words and display the suitable definition.

(Concepts to be used: Conditional Statement, Looping Statement, Array and Pointers)

4. Program to read the given file and generate a report. One of the common formats for interchange of formatted data is 'tab delimited' where each line corresponds to a single record. The individual fields of the record are separated by tabs. For this problem, download the file POPULATION_AND_AREA_OF_CORPORATIONS_AND_MUNICIPALITIES.xls which is converted into POPULATION_AND_AREA_OF_CORPORATIONS_AND_MUNICIPALITIES.txt. This contains the municipality wise population with area in Tamilnadu. The first row of the file contains the column headings. There are six self explanatory fields. Your task is to read the file using fscanf and generate the following reports.

- a. Type wise report (only consider Type, Name of the ULB(Urban Local Body) with Grade, Population (2001 Census), Population (based on houselisting) provisional & Area (in Sq.km))

- b. ULB with Grade wise report in alphabetical order (only consider Name of the ULB with Grade, Population (2001 Census), Population (based on houselisting) provisional & Area (in Sq.km))
- c. Sort by Population (2001 Census)
- d. Sort by Population (based on houselisting) provisional
- e. Sort by Area (in Sq.km)

(Concepts to be used: Functions, Structure and Files)**(Download: POPULATION_AND_AREA_OF_CORPORATIONS_AND_MUNICIPALITIE S.xls)**

5. Develop the application for bus ticket booking system, in which allocation of seats randomly and check the neighbor should be same gender or relative if gender is different.
- a. Book the ticket
 - b. Ticket cancellation
 - c. Report generation

(Concepts to be used: Switch Case, Functions and Files)



140CA0108 **HARDWARE & TROUBLE SHOOTING LABORATORY**

Category: Technical

Mode of Delivery: Practical –4 Hrs/Week;

Total hours: 45

Credit: 2

AIM:

Impartation of real world experience in assembling the computer components and installation of operating systems. //

LIST OF EXPERIMENTS:

1. Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral.
2. The students have to be provided with a Personal Computer thereby they should be able to assemble and disassemble back the components inside the PC to the working condition with all the necessary tools and hardware components.
3. The students should identify, install the necessary Internal and External Cables thereby power is supplied to the Personal Computer for its proper functionality with the help of Switched Mode Power Supply (SMPS).
4. Identify the Operating system for the assembled Personal Computer and install them with predefined configurations.
5. Involve the students to identify the procedure for formatting a Hard Disk of 1 TB size and assign the partition in varying sizes making one as a Healthy Primary Partition Drive.
6. The students have to identify the problem in the PC which does not boot properly that might have occurred due to improper assembly or defective hardware problems. They have to identify and fix the problem to get back the computer to its working condition.
7. The students have to identify the problem in the PC which does not work properly due to software problems. They have to identify and fix the problem to get back the computer to its working condition.
8. The students must involve in connecting the Local Area Network and access the Internet, where they should be able to configure the TCP/IP settings for accessing the websites and email.
9. Install the printer drivers in a network for Windows operating systems that have varying methods of printer connection. At the same time, the users must be provided to change the default printer driver settings to match their environment.



Category: Technical

Mode of Delivery: Practical –4 Hrs/Week;

Total hours: 45

Credit: 2

WRITTEN COMMUNICATION

1. Remedial English Subject- verb agreement - concord - tense forms - auxiliary verbs – different ways of rewriting sentences.
2. Scientific Style Clarity - simplicity - exactness - brevity - unity - coherence- objectivity.
3. Formal and Informal Writing.

ORAL COMMUNICATION

1. Stress and Intonation.
2. Delivery Techniques. The extemporaneous speech and the manuscript speech - The physical Aspects of speech – audience interaction.
3. The Use of Visual Aids Criteria of visual aids (visibility, clarity, simplicity, control)
The tools of visual presentation*. (Chalk board, chart, and overhead projector and so on.)
4. Practice in Oral Communication
 - (a) Short speech *
 - (b) Group discussion – as a participant and as a moderator. *
 - (c) Mock press conference
 - (d) Seminar
 - (e) Mock interview
 - (f) Speech based on a situation *
 - (g) Extemporaneous speech

Practice will also be given in conducting a meeting - welcoming a gathering, presiding over a function and proposing vote of thanks.

*Case Studies Applicable.



SEMESTER – II

140CA0201

RESOURCE MANAGEMENT TECHNIQUES

Category: General

Mode of Delivery: Lecture –3 Hrs/Week; Tutorial – 1 Hr/Week

Total hours: 60

Credit: 4

AIM:

Impart the knowledge of Operations Research Techniques for Analysis and Modeling in Computer Applications.

OBJECTIVES:

- Understand and apply the linear, integer programming to solve operational problems.
- Finding the optimal solution in warehousing and travelling problems using transportation and assignment models.
- Preparation of project scheduling using PERT and CPM.
- Identify and analyze appropriate queuing model in queues related problems.
- Application of optimization concepts in real world problems.

UNIT I LINEAR PROGRAMMING SOLVING

9+3

Principal components of decision problem - Modeling phases - LP Formulation and graphical solution – Simplex method – Big M method.

UNIT II TRANSPORTATION AND ASSIGNMENT MODELS

9+3

Mathematical formulation of transportation problem- Methods for finding initial basic feasible solution- Optimal solution- Degeneracy- Mathematical formulation of Assignment models- Hungarian algorithm- Variables of the assignment problems.

UNIT III INTEGER PROGRAMMING

9+3

Cutting plan algorithm- Branch and bound methods, Multistage (Dynamic) Programming.

UNIT IV SCHEDULING BY PERT AND CPM

9+3

Network construction - Critical path method - Project Evaluation and Review Technique - Resource Analysis in Network scheduling.

UNIT V QUEUEING THEORY

9+3

Markovian models- M/M/1, M/M/C, finite and infinite capacity- M/M/ queues- Finite source model- M/G/1 queue (steady state solutions only).

TEXT BOOKS:

1. Taha H. A., Operations Research- An Introduction, Seventh Edition, Pearson Education, Delhi, 2002
2. Winston, Operations Research. Thomson Learning, 2003.

REFERENCE BOOK:

1. P K Gupta and D S Hira, Operations Research, S Chand & Co., 2003.



Category: Technical

Mode of Delivery: Lecture –3 Hrs/Week;

Total hours: 45

Credit: 3

AIM:

The aim of this course is to provide an understanding of the language translation peculiarities by designing the phases of Compiler and Design different types of parsers.

OBJECTIVES:

- Analyze the relationship between system software and machine architecture and implementation of assemblers, linkers and loaders.
- Identify and evaluate the phases of compiler.
- Design, analyze the function and implementation of assemblers, linkers and loaders

UNIT I BASICS OF SYSTEM SOFTWARE AND ASSEMBLER

9

Introduction – System software and SIC/XE machine architecture - Basic assembler functions – Assembler algorithms and data structures – Machine dependent assembler features- Instruction formats and addressing modes – Program relocation – Machine independent assembler features – Literals – Symbol-defining statements – Expressions – Program Blocks – Control Sections and Program Linking

UNIT II COMPILER- LEXICAL ANALYSIS, SYNTAX ANALYSIS

9

Phases of compiler-Lexical Analysis- Role of a Lexical analyzer- input buffering-specification and recognition of tokens-Finite Automata- Designing a lexical analyzer generator- Pattern matching based on NFA's. Syntax Analysis: Role of Parser- Top-down parsing- recursive descent and predictive parsers (LL)- Bottom-Up parsing- Operator precedence parsing- LR, SLR and LALR parsers.

UNIT III COMPILER- CODE GENERATION

9

Intermediate languages: graphical representations- DAGs- Three address code- types of three address statements- syntax directed translation into three address code- implementation of three address statements.

UNIT IV COMPILER OPTIMIZATION

9

Code Optimization- Machine dependent and machine independent code generation: Sources of optimization-Code Generation-Semantic stacks- evaluation of expressions-control structures and procedure calls

UNIT V LOADERS AND LINKERS

9

Basic loader functions: Design of an Absolute Loader – A Simple Bootstrap Loader Machine dependent loader features Relocation – Program Linking – Algorithm and Data Structures for Linking Loader. Machine-independent loader features – Automatic Library Search – Loader Options Loader design options – Linkage Editors – Dynamic Linking – Bootstrap Loaders.

TEXT BOOKS:

1. Leland Beck , System Software – An Introduction to Systems Programming, Third Edition, Pearson Education, Inc., 2008.(Unit I,IV,V)
2. A.V. Aho, R. Shethi and Ulman; Compilers - Principles, Techniques and Tools, Second Edition,Pearson Education, 2012.(Unit II,III,IV)

REFERENCE BOOK:

1. D. M. Dhamdhare, Systems Programming and Operating Systems, Tata McGraw Hill Company,Second Edition, 2009.



Category: Technical

Mode of Delivery: Lecture –3 Hrs/Week; Tutorial – 1 Hr/Week

Total hours: 60

Credit: 4

AIM:

Learn implement reliable and maintainable object-oriented applications composed of several classes.

OBJECTIVES:

- Reuse software through a collection of C++ predefined classes.
- Understand the differences between procedural and object-oriented paradigms.
- Develop custom classes using encapsulation, polymorphism, and abstraction.
- Design and implement OO programs.

UNIT I OOP PARADIGM

9+3

Programming Paradigms-Evolution - Introduction to OOP-Structured Versus Object Oriented Development-Elements of Object Oriented Programming-Popular OOP Languages-Merits and Demerits of OO Methodology- Expressions and Statements

UNIT II CLASSES AND OBJECTS

9+3

Overview of C++ – Classes and Objects – constructor and destructor – Friend Functions – Friend Class Inline Function – Static Members – Arrays – Pointers – References – Dynamic Allocation

UNIT III OVERLOADING

9+3

Function Overloading–Overloading Constructor Functions–Copy Constructors–Default Argument–Operator Overloading–Member Operator Overloading–Overloading new and delete

UNIT IV INHERITANCE AND TEMPLATES

9+3

Inheritance – Base Class – Access Control – Virtual Functions – Pure Virtual Functions– Templates – Generic Functions – Applying Generic Functions–Generic Classes

UNIT V ERROR HANDLING AND FILES

9+3

Exception Handling -Restricting Exceptions – C++ I/O Streams-Predefined Streams –Formatted I/O-Manipulators Functions - File I/O-Reading and Writing text files-Unformatted and Binary I/O-Random Access Files-STL.

TEXT BOOKS:

1. K.R.Venugopal, Rajkumar Buyya, T.Ravishankar ,Mastering in C++, Second Edition, Tata McGraw Hill,2013. (Unit I).
2. Herbert Schildt, C++ The Complete Reference, Fourth Edition ,Tata McGraw Hill, 2007. (Unit II to V).

REFERENCE BOOKS:

1. Stephen Prata, C++ Primer Plus, Addison Wesley, Sixth Edition ,2012.
2. Bjarne Stroustrup , The C++ Programming Language, Addison-Wesley , Fourth Edition,2013.



Category: General

Mode of Delivery: Lecture –3 Hrs/Week;

Total hours: 45

Credit: 3

AIM:

The aim of this course is to create awareness on Engineering Ethics and Human Values

OBJECTIVES:

- Learning the moral and social values and loyalty.
- Understand the concepts of computer ethics in work environment.
- Identify threats in computing environment.
- Analyze the intricacies of accessibility issues.

UNIT I HUMAN VALUES & ENGINEERING ETHICS

9

Morals, Values and Ethics – Integrity – Work Ethics – Service Learning – Civic Virtue – Respect for others – Living Peacefully – Caring – Sharing – Honesty – Courage – Value time – Co-operation – Commitment – Empathy – Self-confidence – Spirituality- Character - Engineering Ethics: The History of Ethics-Purposes for Engineering Ethics-Engineering Ethics-Consensus and Controversy – Professional and Professionalism –Professional Roles to be played by an Engineer –Self Interest, Customs and Religion-Uses of Ethical Theories-Professional Ethics-Types of Inquiry – Engineering and Ethics-Kohlberg's Theory – Gilligan's Argument –Heinz's Dilemma.

UNIT II COMPUTER HACKING

9

A General Introduction – Computer Ethics: An Overview – Computer Hacking – Introduction – Definition of Hacking – Destructive Programs – Hacker Ethics – Professional Constraints – BCS Code of Conduct – To Hack or Not To Hack – Ethical Positions on Hacking.

UNIT III ASPECTS OF COMPUTER CRIME AND INTELLECTUAL PROPERTY RIGHTS

9

Aspects of Computer Crime Introduction – What is Computer Crime – Computer Security Measures – Professional Duties and Obligations – Intellectual Property Rights – The Nature of Intellectual Property– Intellectual Property – Patents, Trademarks, Trade Secrets, Software Issues, Copyright – The Extent and Nature of Software Piracy – Ethical and Professional Issues – Free Software and Open Source Code.

UNIT IV REGULATING INTERNET CONTENT, TECHNOLOGY AND SAFETY

9

Introduction – In Defense of Freedom Expression – Censorship – Laws Upholding Free Speech – Free Speech and the Internet – Ethical and Professional Issues – Internet Technologies and Privacy – Safety and Risk – Assessment of Safety and Risk – Risk Benefit Analysis – Reducing Risk.

UNIT V COMPUTER TECHNOLOGIES ACCESSIBILITY ISSUES

9

Introduction – Principle of Equal Access – Obstacles to Access for Individuals – Professional Responsibility – Empowering Computers in the Workplace – Introduction – Computers and Employment – Computers and the Quality of Work – Computerized Monitoring in the Work Place – Telecommuting – Social, Legal and Professional Issues – Use of Software, Computers and Internet Based Tools – Liability for Software Errors – Documentation Authentication and Control – Software Engineering Code of Ethics and Practices – IEEECS – ACM Joint Task Force.

TEXT BOOKS:

1. M.Govindarajan, S.Natarajan and V.S.SenthilKumar, Professional Ethics and Human Values, PHI Learning Pvt. Ltd,2013(unit I).
2. Penny Duquenoy, Simon Jones and Barry G Blundell, Ethical, legal and Professional Issues in Computing, Middlesex University Press, 2008.(unit II to V).

REFERENCE BOOKS:

1. Mike Martin and Roland Schinzinger, Ethics in Engineering, McGraw-Hill, New York 1996.
2. George Reynolds, Ethics in Information Technology, Cengage Learning, 2011.
3. Caroline Whitback, Ethics in Engineering Practice and Research, Cambridge University Press 2011
4. Sara Baase, A Gift of Fire: Social, Legal, and Ethical Issues for Computing and the Internet, Third Edition, Prentice Hall, 2008.



Category: Technical

Mode of Delivery: Lecture –3 Hrs/Week;

Total hours: 45

Credit: 3

AIM:

Develop the designing skills of the students in the area of Web Programming to create real time web pages.

OBJECTIVES:

- Learning the concepts and architecture of the World Wide Web.
- Understanding the usage and practice of mark-up languages.
- Practicing the embedded dynamic scripting on client side Internet Programming.
- Enlightening a knowledge to understand and practice web development techniques on client side

UNIT I INTRODUCTION TO WWW

9

Internet Standards – Introduction to WWW – WWW Architecture – SMTP – POP3 – File Transfer Protocol - Overview of HTTP, HTTP request – response — Generation of dynamic web pages.

UNIT II UI DESIGN

9

Markup Language (HTML): Introduction to HTML - Formatting and Fonts–Commenting Code– Anchors – Backgrounds – Images – Hyperlinks – Lists – Tables – Frames - HTML Forms.

Cascading Style Sheet (CSS): The need for CSS, Introduction to CSS–Basic syntax and structure - Inline Styles – Embedding Style Sheets - Linking External Style Sheets – Backgrounds – Manipulating text - Margins and Padding - Positioning using CSS.

UNIT III INTRODUCTION TO JAVASCRIPT

9

Introduction - Core features - Data types and Variables - Operators, Expressions, and Statements - Functions - Objects - Array, Date and Math related Objects - Document Object Model - Event Handling- Controlling Windows & Frames and Documents - Form handling and validations.

UNIT IV ADVANCED JAVASCRIPT

9

Browser Management and Media Management – Classes – Constructors – Object-Oriented Techniques in JavaScript – Object constructor and Prototyping - Sub classes and Super classes – JSON - AJAX.

UNIT V DOCUMENT OBJECT MODEL

9

Introduction- Document Object Model—Methods-Document – Elements-DOM HTML-DOM CSS-DOM Events-Event Listener-Navigation- Nodes-Node list.

TEXT BOOKS:

1. Harvey & Paul Deitel and Associates, Harvey Deitel and Abbey Deitel, Internet and World Wide Web - How to Program, Fifth Edition, Pearson Education, 2011. (Unit I & II).
2. Thomas A Powell, Fritz Schneider, JavaScript: The Complete Reference, Third Edition, Tata McGraw Hill, 2013.(Unit III to V).

REFERENCE BOOKS:

1. Achyut S Godbole and AtulKahate, Web Technologies, Second Edition, Tata McGraw Hill, 2012.
2. David Flanagan, JavaScript: The Definitive Guide, Sixth Edition, O'Reilly Media, 2011.



Category: Technical

Mode of Delivery: Practical –4 Hrs/Week;

Total hours: 45

Credit: 2

AIM:

Develop the programming skills of the students in implementation of Object Oriented Concepts through C++.

LIST OF EXPERIMENTS:

1. Write a function called feet conversion that takes feet as argument and returns the equivalent feet in inches and meter. Create a program that exercises this function by repeatedly obtaining a feet values from the user and displaying the value of feet to inches, feet to meter using show method . (Class, object, Member function, function overloading)
2. A common place to buy candy is from a machine. The machine sells candies, chips, gum, and cookies. You have been asked to write a program for this candy machine. The program should do the following: i) Show the customer the different products sold by the candy machine. ii). Let the customer make the selection. iii). Show the customer the cost of the item selected. iv). Accept money from the customer. v). Release the item.(Constructor & Destructor)
3. Write necessary class and member function definitions for a cricket player object. The program should accept the details from user (maximum 10) .The details of the player are player code, name, runs, innings played and number of times not out. The program should contain following menu
Enter details of players Display average runs of a single player Average runs of all players Display the list of players in sorted order as per runs.(Static member variables & Static Member function).
4. i) Create a class to add Two times provided in hour minute format. Use functions a) void input() to provide hour and minute. b) gettime (int ,int) to take hour and minute entered by user. c) sum(time,time) to add minutes and hours. If minutes is >60 add 1 with hour. d) void display() to display the result. (Operator Overloading)
ii) Two classes one is Civil_Time and Another is Railway_Time. Enter hours and minutes in Railway time (24 hour format) and display the time in Civil time (12 hour format with a.m. and p.m.) using one class type to another class type conversion.(Templates)
- 5.i) Write a class ACCOUNT that represents the bank account . The class should allow you to deposit money, withdraw money, calculate interest, send you a warning message if you go overdrawn etc. (Exception Handling)

ii) Modify your ACCOUNT class to add constructors and destructors. They should use the constructs new and delete.

iii) Further modify the class ACCOUNT to use overloaded constructors. One could set the account balance to zero and another could set it to a given value.(Constructor Overloading)
6. A University and a Company have jointly taken a project. Class University contains name of the university, department to which the project is assigned, person to whom the project is assigned. A function display is there to display the information. Class Company contains name of the company, Number of Engineers assigned, amount invested to do the project. A function display is there to display the information. Class Project is inherited from University and Company. It contains type of project, duration of project, amount granted to complete the project. A function display displays the related information. Write a program to implement this and display all information except amount invested by company from Project class.(Inheritance)



7.Design an application with Student as abstract class and create derive classes Engineering, Medicine and Science from base class Student. Create the objects of the derived classes and process them and access them using array of pointer of type base class Student.(Virtual & Pure Virtual Function)

8.Write a C++ program that randomly generates complex numbers (use previously designed Complex class) and writes them two per line in a file along with an operator (+, -, *, or /). The numbers are written to file in the format (a + ib). Write another program to read one line at a time from this file, perform the corresponding operation on the two complex numbers read, and write the result to another file - one per line.(Files)

2



Category: Technical

Mode of Delivery: Practical –4 Hrs/Week;

Total hours: 45

Credit: 2

AIM:

The aim of the system software laboratory is to give students a good understanding of basic concepts of computer software and the need of developing software applications using C,C++,Java.

LIST OF EXPERIMENTS:

1. Implement a symbol table with functions to create, insert, modify, search, and display.
2. Implement pass one of a two pass assembler.
3. Implement pass two of a two pass assembler
4. Implement a single pass assembler.
5. Implement an absolute loader.
6. Implement a relocating loader.
7. Implement pass one of a direct-linking loader.
8. Implement pass two of a direct-linking loader.
9. Implement a simple text editor with features like insertion / deletion of a character, word, and sentence.
10. Implement a symbol table with suitable hashing



Category: Technical

Mode of Delivery: Practical – 4 Hrs/Week;

Total hours: 45

Credit: 2

AIM:

Develop the designing skills of the students in the area of Web Programming to create real time web pages.

LIST OF EXPERIMENTS:

1. Develop static pages using HTML for an online Book store
 - a. The website should consist of the following pages
 - b. Home page
 - c. Registration and user login
 - d. User profile page
 - e. Books catalog
 - f. Shopping cart
 - g. Payment by credit card
 - h. Order conformation (HTML Concepts)
2. Develop a web page to design the City's Sunset with the help of Cascading Style Sheets.(Styles in CSS)
3. Develop an interactive web page for an advertisement showing the details about the Mobile Service in your location with the help of HTML and CSS.(CSS Inline Styles)
4. Develop and demonstrate a Recipe System which must use the menu based concept for serving the customers in a Hotel Restaurant System with the help of DHTML and CSS.(DHTML Concepts)
5. Develop an interactive web page that must have a link to option for including the Google Maps. (Embedding of Images)
6. Develop a web page that must contain a registration form with the validation event that must show the error messages in same page using JavaScript. (Validation Concepts)
7. Develop and demonstrate using JavaScript script, a XHTML document that collects the USN(the valid format is: A digit from 1 to 4 followed by two upper-case characters followed by two digits followed by two upper-case characters followed by three digits; no embedded spaces allowed) of the user. Event handler must be included for the form element that collects this information to validate the input. Messages in the alert windows must be produced when errors are detected.(Form handling Concepts)
8. Develop a web page for Simple Quiz- Online Learning System using Java Script with the help of event handlers that must include CSS.(Event Handling)

