**Faculty of Engineering & Technology**
**Board of Studies in Computer Science & Engineering**
**Proposed Curriculum structure of S.E. (CSE) and S.E. (IT)**

**Part – I** **W.E.F. 2007-08**

| Sr. No. | Subject Code | Subjects | Teaching Scheme (Hours/Week) | | Examination Scheme (Marks) | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Lecture | Practical | Theory | TW | Practical | Total |
| 01 | | Engineering Mathematics – III | 4 | -- | 100 | -- | -- | 100 |
| 02 | CSE/IT-2602 | Discrete Mathematics | 4 | -- | 100 | -- | -- | 100 |
| 03 | CSE/IT-2603 | Data Structures (Using C) | 4 | 2 | 100 | -- | 50 | 150 |
| 04 | CSE/IT-2604 | Data Communication | 4 | 2 | 100 | -- | 50 | 150 |
| 05 | CSE/IT-2605 | Digital Electronics | 4 | 2 | 100 | 50 | -- | 150 |
| 06 | CSE/IT-2606 | Advanced C Programming Lab | 2 | 2 | -- | -- | 50 | 50 |
| 07 | | Communication Skills | 2 | -- | -- | 50 | -- | 50 |
| | | **Total of I** | **24** | **8** | **500** | **100** | **150** | **750** |

**Part – II**

| Sr. No. | Subject Code | Subjects | Teaching Scheme (Hours/Week) | | Examination Scheme (Marks) | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Lecture | Practical | Theory | TW | Practical | Total |
| 08 | | Engineering Mathematics – IV | 4 | -- | 100 | -- | -- | 100 |
| 09 | CSE/IT-2612 | Open Source Software Technology | 4 | 2 | 100 | -- | 50 | 150 |
| 10 | CSE/IT-2613 | Computer Graphics | 4 | 2 | 100 | -- | 50 | 150 |
| 11 | CSE/IT-2614 | Microprocessors and Computer Organization | 4 | 2 | 100 | 50 | -- | 150 |
| 12 | CSE/IT-2615 | Object Oriented Programming ( Using C++ ) | 4 | 2 | 100 | -- | 50 | 150 |
| 13 | CSE/IT - 2616 | Mini Project | -- | 2 | -- | 50 | -- | 50 |
| | | **Total of II** | **20** | **10** | **500** | **100** | **150** | **750** |
| **Total of I and II** | | | | | **1000** | **200** | **300** | **1500** |

**Title of the Subject: Engineering Mathematics - III**
**(Syllabus common to SE (C/M/E/Etc/CSE/IT)**
**Title of the Subject: Discrete Mathematics**
**Course code: CSE/IT - 2602**

**Teaching Scheme :** **Examination Scheme:**
Theory : 4 Hrs. / week Theory: 100 marks (One paper, 3 hrs)

**Objectives:**
- To train the students with mathematical foundations of Computer Science
- To give a feel of core mathematics required for many subjects of Computer Science

**Contents**:

**Unit 1 : Sets and Probabilities** (8 )
Contribution of sets, finite and infinite sets, unaccountably infinite sets. The rules of sum and product, discrete probability, conditional probability.

**Unit 2: Relations and Functions** (8 )
Properties of Binary Relations, Equivalence relation and partitions, Partial ordering Relations and Lattices. Chain and Anti-chains, A Job-Scheduling problem, Functions and Pigeonhole principles.

**Unit 3 : Graphs & Trees** (8 )
Basic terminology, Multigraphs and Weighted graphs, Paths and Circuits, Shortest paths in weighted graphs, Eulerian paths and circuits, The traveling salesman problem, factors of a graph, Planner graphs, Trees, Rooted Trees, Path lengths in rooted trees, Prefix codes, Binary search trees, spanning trees and cutsets, Minimum spanning trees. Transport networks.

**Unit 4 : Discrete Numerical Functions and Recurrence Relations** (8 **)**
Manipulation and Numerical Functions, Asymptotic behavior, Generating functions and Combinatorial Problems, Recurrence relations, Linear recurrence relations with constant coefficients, Homogeneous solutions, Particular Solutions, Total Solutions, Solutions by the method of generating functions.

**Unit 5 : Groups, Rings and Boolean Algebra** (8 )
Generators and Evaluation of powers, Closets and Lagranges Theorem, Rings, integra, domains and fields, Lattices and Algebraic systems, Principal of duality, Basic properties of Algebraic systems defined by lattices, Boolean lattices and Boolean algebras, Boolean functions and Boolean expressions, Propositional Calculus, Design and implementation of digital networks, switching circuits.

**Text Books:**
1. C.L.Liu , "Elements of Discrete Mathematics", Tata McGraw-Hill Publication
2. Kollman, Busby and Ross, "Discrete Mathematical Structures", PHI

**Reference Books:**
1. Swapankumar Sarkar, "A Text book of Discrete Mathematics", S Chand Publication
2. Satindar Pal Gupta , "Discrete mathematics and structures", Laxmi publications
3. G Shankarrao , "Mathematical foundation of Computer Science" , I.K. International
4. Trembley , Manohar, "Discrete mathematical Structures with Application to Computer Science", McGraw Hill Pub.

**Title of the subject: Data Structures (Using C)**
**Course Code: CSE/IT – 2 6 0 3**

**Teaching Scheme :** **Examination Scheme :**
Lectures : 4 hrs/week Theory Paper: 100 marks (3 hrs)
Practical: 2 hrs/week Practical Exam: 50 Marks ( 3hrs)

**Objectives:**
- To train the students on fundamentals that one must learn of data structures
- To train the students for a strong foundation for programming using data structures

**Contents:**

**Unit 1: Introduction to data structure, The Stacks& Queues -** [8]
The Arrays as an ADT: Using One-Dimensional Arrays, Using Two-Dimensional Arrays, Using Multidimensional Arrays, Definition and Examples, Primitive Operation, The stack as an ADT, The queue and its sequential representation, The queue as an ADT, Basic Definition and examples: Infix, Postfix, and Prefix, Program to evaluate a Postfix expression, Limitations of the program, Circular Queue, priority queue

**Unit 2: Linear Data Structure & their representation** [8]
Definition, concept, operation on linked lists, Circular linked lists
Doubly linked lists, Operations like insertion, deletion, insertion in order, searching, updating , Applications of linked lists such as polynomial manipulation, Comparison of singly linked, circularly linked & doubly linked list

**Unit 3: Trees** [8]
Definition, Basic terminology, operation on binary trees, linked storage representation for binary search trees, Basic operation on binary search tree such as creating a binary search tree, searching, modifying an element, inserting & deleting the element, destroy a binary search tree, tree traversals ,in-order, pre-order, post-order , tree application for expression evaluation & for solving sparse matrices.

**Unit 4: Graphs** [8]
Definitions, basic terminology, matrix representation & implementation of graphs, graph travels, DFS, BFS, Shortest path, spanning tree
**Unit 5**: **Sorting & searching** [8] Different sorting tech, classification on the basis of big-O notation, tech such as straight selection sort, bubble sort, merge sort, quick sort, heap sort, shell sort, radix sort, comparisons between different sorting techniques
Sequential searching, binary searching, height balanced trees2-3 tree, B trees, B+ trees, AVL trees
**Text Books:**
1. Yedidyah Langsam, Moshe J. Augenstein, Aaron M.Tenenbaum, "Data Structures using C and C++ " , Pearson Pub.
2. Yashavant P Kanetkar, "Data Structures through C", BPB Pub. ( Book with CD)
3. G.S. Baluja, "Principles of Data Structures using C and C++",
**Reference Books :**
1. Ellis Horowitz, Sartaj Sahni, "Fundamentals of Data Structures",
2. Robert L Kruse, "Data Structures and Program Design", PHI
**Practical Examination:**
The term work shall consist of at least 10 experiments/ assignments based on the syllabus above. The Practical Examination shall consist of writing and performing an experiment / assignment and oral based on the syllabus as per the journal record. Duration of examination is three hours. Assessment of term work should be done at the time of practical examination which will consider the points below and the marks should be awarded accordingly.
* Continuous lab assessment
* Actually performing practicals in the laboratory during the semester
**Suggestive List of Experiments:**
1. Program for implementing Stack and Queue.
2. Program for implementing Singly Linked List and Doubly Linked List.
3. Program for implementing Circular Queue using Linked List.
4. Program for Creation of Binary Tree and operations on it.
5. Program for Creation of Binary Threaded Tree.
6. Program for Depth First search and Breadth First search.
7. Program for Bubble Sort and Bucket Sort.
8. Program for Merge Sort and Heap Sort.
9. Program for Insertion Sort and Quick sort.
10. Program for Binary Search to search an element in the given sequence.
11. Program to implement two stacks in the one array.

**Title of the subject**: **Data Communication**
**Course Code: CSE/IT - 2604**

**Teaching Scheme :**
Lectures : 4 hrs/week
Practical: 2 hrs/week
**Examination Scheme :**
Theory Paper: 100 marks (3 hrs)
Practical Exam: 50 Marks ( 3hrs)
**Objectives:**
- To train the students on fundamentals of data communication
- To have a clear understanding of different communication media further required in Computer and IT industry
**Contents:**
**Unit 1: An Overview of Data Communication & Terminal Devices** [8]
The Importance of Data Communications, The First Data Communications Systems, Two-State Communications Systems, Need for modulation, Types of modulation – AM, FM, PM, PAM,FSK,PSK, PCM, Early Communications Codes, Modern Codes, Tele-printers , Data Communications in Computing, General Description of Data Communications Systems, Tele-printers, Tele-printers versus CRT Terminals, Serial Printers, CRT Terminals, Parts of a Terminal, PC Terminals, The Need for Speed, Data Transmission.
**Unit 2 :Messages and Transmission Channels** [8]
Information as a Quantity, Bounded Medium, Unbounded Medium, Effects of Bandwidth on a Transmission Channel, Bandwidth Requirements for Signals.
**Unit 3: Synchronous , Asynchronous Modems and Interfaces** [8]
Why Data can not be transmitted Directly, Solving the Problem with Modems, Analog Modulation, V.21 Standard, Modem Features, Interface and Signaling Standards, The RS- 232 and V.24 Interface, Smart Modems, Fax Modems
Synchronous Signaling and Standards, Typical Synchronous Components, High-Speed Modems.
**Unit 4 : Multiplexing, Fiber-Optic and Satellite Communications** [8]
Sharing a Channel: FDM ,DM , PCM, Framing,
Time Division Multiplexing ,Statistical Time-Division Multiplexing, Introduction and Historical Perspective, Fundamentals of Fiber-Optic Systems, Fiber-Optic Subsystems and Components,
Satellite Transmission Systems.
**Unit 5 :PC Communications Software/ Local Area Networks/ The Internet** [8]

Communications Program Features, Dial-Up Networking, Overview of LANs, The Ideal LAN, LAN Standards, Internetworking Devices, Evolution of the Internet, Application Services, Internet Access Providers, IP Addressing
Mobile Wireless, GSM, CDMA & Network Types

**Text Books:**

1. Gilbert Held , "Understanding Data Communications", Seventh Edition Addison Wisley,

**Practical Examination:**

The term work shall consist of at least 10 experiments/ assignments based on the syllabus above. The Practical Examination shall consist of writing and performing an experiment / assignment and oral based on the syllabus as per the journal record. Duration of examination is three hours. Assessment of term work should be done at the time of practical examination which will consider the points below and the marks should be awarded accordingly.

* Continuous lab assessment
* Actually performing practicals in the laboratory during the semester

**SuggestiveList of Experiments :**

1. Create a program in C for Conversion of string into Morse Code.
2. Explain the Two state communication system.
   Create a program for Conversion of string into its binary form.
3. What is Data Communication? Explain the transmission media's for bounded medium. Draw and explain the spectrum of unbounded media's.
4. Create a network cable for communicating two PC's.
5. Installation of the physical connection between two PC's & creates a windows workgroup.
6. What are the different topologies to form LAN? What is Hub? Explain with neat diagram?
   Which topology is used in your LAB?
7. Explain the following with neat diagram. Switch,Hub,Gateway,Bridge,Router
8. To study of windows workgroup & attach a PC to existing LAN
9. Study of Dial-Up Connection for Internet through modem.
10. Write a C program to implement LZW Algorithm.
11. To study the network & setup of LAN establishment in the Laboratory.

**Title of the subject: Digital Electronics**
**Course Code: CSE/IT - 2605**

| **Teaching scheme:** | **Examination scheme:** |
|---|---|
| Theory: 4 Hrs/week | Theory: 100 marks (paper 3 hrs) |
| Practical: 2 Hrs/week | Term Work: 50 marks |

**Objectives :**

- To learn the fundamentals of digital electronics
- To study various building blocks of digital circuits on which the computers are built.
- To learn the Boolean algebra, the base for digital maths

**Contents:**

**Unit 1: Fundamental concepts, Number system** (8)

Digital signals, basic digital circuits, Boolean algebra, IC gates. Number system and codes: Number systems, Binary number system, signed binary numbers, binary arithmetic, 2's complement arithmetic, octal number system, Hexadecimal number system, Gray code, Excess three codes, error detecting and correcting codes.

**Unit 2: Semiconductor Devices and families** (8 )

Semiconductor devices: Review of p-n junction and Schottky diodes, Bipolar junction diodes, FET
Digital logic families: Characteristics of digital ICs, RTL, TTL, Schottky TTL, ECL, MOS logic, CMOS logic, tri-state logic

**Unit 3: Combinational logic design** (8 )

Standard representations for logical functions, Karnaugh Map representation of logical functions, Simplification of logical functions using K-map, Minimization of logical functions, don't care conditions, Design examples, Quine-McClusky minimization technique.

**Unit 4: Combinational Logic design using MSI circuits** ( 8 )

Multiplexers and their use in combinational logic design. Demultiplexers/ decoders and their use in combinational logic design. Adders and their use as subtractors. BCD arithmetic, ALU, Digital comparators, parity generators/checkers, code converters.

**Flip-flops**: A 1-bit memory cell, clocked S-R flip-flop, J-K, D-type, T-type, flip-flops, Excitation table of flip-flops, Clocked flip-flop design, edge triggered flip-flops, applications of flip-flops.

**Unit 5: Sequential logic design** ( 8 )

Registers, applications of shift registers, Ripple or asynchronous counters, synchronous counters, clocked sequential circuit design, asynchronous sequential circuits.

**Timing circuits**: Application of logic gates in timing circuits, OP AMP and its application in timing circuits, Schmitt trigger ICs, Monostable multivibrator ICs, 555 timer

**Text Books:**

**1.** R. P Jain, "Modern Digital Electronics", Tata Mcgraw Hill.
**2.** R. P. Jain & Thomas L. Floyd,"Digital Fundamentals", Pearson Education

**TERM Work:**

The term work shall consist of at least 10 experiments / assignments based on the syllabus above.

Assessment of term work should be done as follows:

* Continuous lab assessment
* Actually performing practicals in the laboratory
* Oral Examination conducted (internally) at the time of submission

**Suggestive list of experiments:**

1) Study of digital ICs and verification of Logic Gates
2) Study & verification of operation of half and full Adder
3) Study & verification of operation of half and full Adder
4) Verification of operation code converter
5) Verification of operation Multiplexer & Demultiplexer
6) Verification of operation 2 bit comparator
7) Verification of operation of ALU
8) Study & Verification of operation FILP FLOP
9) Study & Verification of operation Shift Registers
10) Study & Verification of operation of counters

**Title of the subject: Advanced C Programming Lab**
**Course Code: CSE/IT - 2606**

**Teaching scheme:**
Theory: 2 Hrs/week
Practical: 2 Hrs/week

**Examination scheme:**
Practical: 50 marks ( 3 hrs)

**Objectives:**

- Learn the C programming in detail.
- Facilitate the students to use C as a language of expression of logic
- Provide extensive hands on for C.

**Contents:**

**Unit 1: Arrays** (3 )

Array declaration, array initialization, array processing, sizeof( ) an array, multidimensional arrays, strings, string operations

**Unit 2: Functions** ( 3 )

Function definition, calling and returning functions, actual and formal parameters, Recursion, function prototypes.

**Unit 3: Pointers** ( 4 )

Pointer operators, pointer expressions, initializing pointers, pointer arithmetic, pointers and function arguments, pointers to function, pointers and arrays, pointers and strings, memory allocation malloc( ), calloc( ), free( ), realloc( ) functions, array of pointers, pointers to pointers

**Unit 4: Structure** ( 4 )

structure declaration, initialization of structure, structure and functions, array of structures, nested structures, structures and pointers, unions, user defined data type(typedef), enumerated data type.

**Unit 5: Files** ( 4 )

File system basics, file operations, file open, file read, file close operations, file opening modes, string I/O in files, record I/O in files, text and binary files.

**Unit 6: Graphics in C** ( 2 )

Text mode graphics functions: window( ), cputs( ), clrscr( ), gotoxy( ), putch( ) functions. Graphics mode graphics functions: initgraph( ), closegraph( ), circle( ), line( ), bar( ), rectangle( ), setcolor( ), setbkcolor( ), settextstyle( ), setpalette( ), floodfill( ). Animated graphics: delay( ), sound( ), nosound( ).

**Text Books:**

1. Byron Gottfried, "Programming with C" 2nd edition. Tata Mcgraw Hill.
2. Yashwant Kanetkar: "Let Us C", BPB publication
3. G.S.Baluja & G.K.Baluja: "Understanding C, a practical approach", Dhanpat Rai & Co.

**Practical Examination:**

The term work shall consist of at least 10 experiments/ assignments based on the syllabus above. The Practical Examination shall consist of writing and performing an experiment / assignment and oral based on the syllabus as per the journal record. Duration of examination is three hours. Assessment of term work should be done at the time of practical examination which will consider the points below and the marks should be awarded accordingly.

* Continuous lab assessment
* Actually performing practicals in the laboratory during the semester

**Suggestive list of experiments:**

1. Menu driven program for matrix addition and subtraction
2. Program for matrix multiplication.
3. Program to generate Fibbonacii series and/or factorial of a number using recursive function.
4. Program for dynamic memory allocation functions: malloc( ), calloc( ), and free( ).
5. Program to accept and display student information using structure.
6. Program to pass structure/array as a parameter to a function.
7. Program to prepare salary bill of a company using files.
8. Program to prepare monthly telephone bill
9. Program to create drawings using basic graphics functions.

10. Program to merge two files.
11. Program to arrange numbers in the shape of a pyramid / triangle.

**Title of the Subject: Communication Skills**
**Course code:**
**(Syllabus common to SE (C/M/E/Etc/CSE/IT)**

Lectures : 2 hrs/week — Term Work: 50 marks

**Title of the Subject: Engineering Mathematics - IV**
**Course code:**
**(Syllabus common to SE (C/M/E/Etc/CSE/IT)**

**Title of the subject: Open Source Software Technology (OSST)**
**Course Code : CSE/IT - 2612**

**Teaching Scheme :**
Lectures : 4 hrs/week
Practical: 2 hrs/week

**Examination Scheme :**
Theory Paper: 100 marks (3 hrs)
Practical Exam: 50 marks ( 3 hrs)

**Objectives:**
This course is aimed to:

- understand open source movement worldwide
- use the fastest growing open source operating system, "Linux", today
- effectively install, use and perform basic configuration of Linux system
- build user-level skills to perform Linux System Administration in IT profession
- enable competency in industry-problem identification and resolution
- develop application using LAMP

**Contents:**

**Unit 1: Open Source and Linux** ( 8 )
Open Source Definition, The distribution terms of open source software, open source technology importance,
Free and Open Source Software ( FOSS ), LAMP ( Linux, Apache, MySQL, PHP, Python, and Perl.). Benefits, Perspectives of Open Source software Linux and Open Source, Linux Usage Basics: Logging into the system, changing users and editing text files. Running Commands and Getting Help, Browsing the File system, Users, Groups and Permissions.

**Unit 2: Linux Administration** ( 8 )
Installation of Linux interactively, Perform user and group administration, Administer the Linux printing subsystem, Automate tasks with at, cron , Install, update, query and remove software packages with RPM

**Unit 3: Linux Application** ( 8 )
Accessing and Running Applications: cc compiler, gcc Compiler, Mozilla Firefox. Multimedia in Linux : Listening to Audio, Playing video, Using Digital Camera, Recording music / video CDs. Publishing: Open office, Working with Graphics, Printing Documents, Displaying documents with Ghostscript and Acrobat, Using Scanners driven by SANE.

**Unit 4: Apache and PHP** ( 8 )
Introduction to Web server. Installing Apache on Linux: httpd service.
PHP : Testing Installation. Basics of PHP scripts, Variables, Datatypes, Operators and Expressions, Constants, Flow control functions , If statement, Loops, Arrays , Strings , Dates and Times , Forms.

**Unit 5: MySQL Server and Application** ( 8 )
MySQL : Configuring MySQL Server, working with MySQL Databases, MySQL Tables, SQL Commands – INSERT, SELECT, UPDATE, REPLACE, DELETE. Date and Time functions in MySQL. PHP – MySQL Application Development : Connecting to MySQL with PHP, Inserting data with PHP, Retrieving data with PHP. Developing PHP scripts for dynamic web page like Feedback form, online admission form, online test.

**Reference Books:**

| | **Title** | **Author** | **Pub** |
|---|---|---|---|
| 1 | Red Hat Linux Bible | Christopher Negus | Wiley Publishing<br>ISBN : 0-7645-4333-4 |
| 2 | PHP, MySQL and Apache | Julie C Meloni | Pearson Education<br>ISBN : 81-297-0443-9 |
| 3 | The Complete Reference Linux | Peterson | Tata McGRAW HILL<br>ISBN : 0-07-044489-7 |
| 4 | UNIX using Linux | Jack Dent,<br>Tony Gaddis | Course Technology ( Thomson Learning)<br>ISBN : 981-240-218-7 |

**Internet Resources:**

| | | |
|---|---|---|
| 2 | Open Source Technology : Brief | http://www-128.ibm.com/developerworks/opensource/newto/ |
| 3 | Open Source : Benefits | http://www.sun.com/software/opensource/ |
| 4 | Beginner's Guide to Linux<br>- Michael Jordan | http://www.linux.org/lessons/beginner/ |

| Sn | Title | URL |
|---|---|---|
| 1 | Open Source Phenomenon | http://opensource.org/ |

| | | |
|---|---|---|
| 5 | Linux Course for Intermediate Level Users - Michael Jordan | http://www.linux.org/lessons/interm/index.html |
| 6 | PHP Manual | http://www.php.net/tut.php |

**Practical Examination:**
The term work shall consist of at least 10 experiments/ assignments based on the syllabus above. The Practical Examination shall consist of writing and performing an experiment / assignment and oral based on the syllabus as per the journal record. Duration of examination is three hours. Assessment of term work should be done at the time of practical examination which will consider the points below and the marks should be awarded accordingly.

* Continuous lab assessment
* Actually performing practicals in the laboratory during the semester

**Suggestive List of Experiments:**

1. Installation of Linux
2. Use of various commands
3. Use of Text Processing Tools : grep, cut,
4. User and Group Creation
5. Back up using tar
6. Installation using RPM
7. C/C++ program using cc / gcc
8. Configuring Apache
9. PHP script for sorting the marks
10. PHP scripts for other tasks
11. MySQL Installation , Configuration and Testing
12. Design of admission form using PHP – MYSQL

**Title of the Subject: Computer Graphics**

**Course Code: CSE/IT - 2613**

**Teaching Scheme :**
Lectures : 4 hrs/week
Practical: 2 hrs/week

**Examination Scheme :**
Theory Paper: 100 marks (3 hrs)
Practical Exam: 50 Marks ( 3hrs)

**Objectives:**

- Introduce the students to graphics fundamentals
- Make them aware of 2-D and 3-D graphics primitives
- Study the GUI design methods
- Know the basics of multimedia applications

**Contents:**

**Unit 1: Introduction and applications** (8 )

What is Computer Graphics?, GUI Applications, Conceptual framework for CG. Display Devices: Random scan and raster scan monitors, color CRT, Plasma panel displays, LCD panels, 3-D viewing devices Graphical Input Devices, Hard copy devices, Introduction to graphics standards (SRGP, PHIGS etc) Line drawing algorithms: DDA and Bresenham's. Graphics primitives, Line functions, character attributes, properties of circle, Circle generating algorithm, filling rectangles, filling polygons

**Unit 2: 2-D Drawing Geometry and transformation** ( 8)

2-D transformations, homogeneous coordinates and matrix representation of 2-D transformations, other 2-D transformations: reflection and shear, window to viewport transformation, clipping in raster world, clipping lines, clipping polygons, text clipping and exterior clipping

**Unit 3: 3 D transformations/ User interface** ( 8 )

3-D viewing: An introduction, Projections, 3-D transformations, matrix representation, composition of 3-D transformation, coordinate system GUI and interactive input methods: The user dialogue, features of GUI:Windows and icons, accommodating multiple skill levels, consistency, minimizing memorization, backup and error handling, feedback. Logical classification of input devices, input functions, concurrent use of input modes, interactive picture construction techniques

**Unit 4: Curves/ Visible surface Detection** ( 8 )

Curves: Parametric cubic curves, parametric bicubic surfaces. Curve drawing and fitting techniques. Bezier curves: Its properties, parametric representation. Techniques for visible surface detection, algorithm for visible line determination, Back face detection and removal, Z- buffer algorithm, Visible surface Ray tracing algorithm.

**Unit 5: Multimedia and its applications** (8 )

What is multimedia, multimedia building blocks: text audio, images, animation, video. Elements of multimedia system, multimedia hardware, basic tools in multimedia

**Text Books:**

1.Donald Hearn and Baker, "Computer Graphics", PHI Pub.

2. ISRD Group, "Computer Graphics", Tata McGraw Hill Pub. , ISBN-0-07-059376-0.

**Reference Books:**

1. A P Godse , "Computer Graphics", Technical pub., 3rd Revised Edition

2. J.D. Foley, A V Dam, "Computer Graphics, Principles and Practice", Addison Wesley Pub.

**Practical Examination:**

The term work shall consist of at least 10 experiments/ assignments based on the syllabus above. The Practical Examination shall consist of writing and performing an experiment / assignment and oral based on the syllabus as per the journal record. Duration of examination is three hours. Assessment of term work should be done at the time of practical examination which will consider the points below and the marks should be awarded accordingly.

* Continuous lab assessment
* Actually performing practicals in the laboratory during the semester

**Suggestive list of Experiments:**

1. Program for Line Drawing using DDA algorithm
2. Program for Line Drawing using Bresenham's algorithm
3. Program for Circle Generation using mid point algorithm
4. Programs using 2-D transformations
5. Programs to study window to viewport transformations
6. Programs to study 3-D transformations
7. Program for Cohen –Sutherland Line clipping algorithm
8. Program to show simple animations such as- Moving car, rain drops, moon revolving around earth, growing plant, rotating triangle, bouncing ball, dancing doll etc.
9. Program to generate Bezier Curve
10. Program to create a simple and proper "User Interface" for a defined application
11. Program to define and create a "form" for data entry for an application
12. Animations using macromedia flash

**Title of the subject: Microprocessors and Computer Organization**

**Course Code: CSE/IT -2614**

| **Teaching scheme:** | **Examination scheme:** |
|---|---|
| Theory: 4 Hrs/ Week | Theory paper: 100 Marks, 03 Hrs |
| Practical: 2Hrs/ Week | Term work: 50 marks |

**Objectives:**

- Have a deeper understanding of how computers work.
- Learn principle of working of microprocessor with the help of 8085.
- Learn the internal organization of computer and factors affecting their performance.
- Learn the design aspects of Processor, Control Unit and Memory

**Unit 1: Microprocessor** ( 8 )

Basics of computer architecture, Evolution of microprocessor families, microprocessor architecture and its operation. Architecture of 8085 microprocessor: Instruction format, addressing modes, detail study of instruction set of 8085, assembly language programming, coding in 8085, stack, subroutine, code conversion.

**Unit 2: 8085 details** (8 )

8085 architecture: Machine cycle, bus cycle concept, fetch and execute cycle, typical timing diagram for instructions. Interrupts in 8085: Introduction to interrupts, response to interrupts, hardware and software interrupts. Interrupt priority, maskable and nonmaskable interrupts of 8085.

**Unit 3: Processor Design** (8 )

Processor organization. Information representation, instruction set, instruction format, instruction types, fixed point arithmetic: Addition, subtraction, multiplication and Division. ALU design.

**Unit 4: Control Unit Design** (8 )

Introduction, instruction sequencing, instruction interpretation, hardwired control design, method, multiplier control unit, CPU control unit, Micro programmed control, control memory optimization.

**Unit 5: Memory organization** ( 8 )

Memory types, memory device characteristics, RAM, Secondary memory, their access techniques, Virtual memory, memory hierarchies, main memory allocation, High speed memories, internal memory, cache, associative memory.

**Text Books:**

1. Ramesh Gaonkar, "8085 Microprocessors",
2. John P Hayes, "Computer Architecture and Organization", McGraw Hill Pub

**Reference books:**

1. A.P Godse, "Microprocessor- I"
2. Vibhute, Borle, "8085 Microprocessors",

**Term Work:**

It shall consist of record of at least 8 programs based on unit 1 and 02, and three assignments based on units 3 , 4 and 5.
Assessment of term work should be done as follows:

* Continuous lab assessment
* Actually performing practicals in the laboratory
* Oral Examination conducted (internally) at the time of submission

**Suggestive list of experiments: Programs will be Assembly Language Programs (ALP).**

1. Study of 8085 microprocessor training kit with an example of addition and subtraction of two numbers.
2. ALP to Determining minimum or maximum element in an array.
3. ALP for Decimal addition.
4. ALP for Sum of elements of an array, result is 16-bit.
5. ALP for multiplication and division.
6. ALP for Counting even or odd numbers from an array.
7. ALP for Block movement of an array of numbers from one area in memory to another.
8. ALP for multiplication of two 16 bit numbers, result is 16-bit.
9. ALP with Subroutine for multiplication or division.
10. ALP using stack.

**Title of the Subject: Object Oriented Programming (Using C++)**
**Course Code: CSE/IT -2615**

| **Teaching Scheme :** | **Examination Scheme :** |
|---|---|
| Lectures : 4 hrs/week | Theory Paper: 100marks (3 hrs) |
| Practical: 2 hrs/week | Practical Exam: 50 Marks ( 3hrs) |

**Objectives:**

- To train the students on fundamentals of Object Oriented Programming
- To train the students for a strong foundation for using these concepts in software development
- To implement OOP concepts using the programming language C++

**1. Introduction to OOPS:** [8]

Advantages of OOPS language & development platform, Basic programming construction functions, program statements preprogramming directives, include directives, header files ,I/O statement variables, manipulators, Loops & Decisions, Arrays , Structures, Functions

**2. Objects and Classes:** [8]

Class as Data type, Object as function arguments, Encapsulation, Data hiding overloaded constructors, object as argument, returning object from function, static class data, Constructors, destructors.

**3. Operator Overloading:** [8]

Overloading unary and binary operators, Overloading binary operators, multiple overloading, comparison operators, conversion between basic types, conversion between objects of different classes conversion between basic types, conversion between basic types between objects of different classes.

**4. Inheritance and Polymorphism:** [8]

Derived class and base class-specifying the derived class, accessing base class member, derived class constructors, overriding member functions public and private inheritance-access combinations classes and structures accessing specifies, levels of inheritance-multiple inheritance. Run time and compile time polymorphism.

**5. Files and streams, Templates in C++:** [8]

Streams-stream class hierarchy, stream classes-string I/O Writing strings, detecting end of file, character I/O Object I/O,I/O with multiple objects-the fstream class, "open" function-file pointers-specifying position, specifying the offset, the calling function, error handling-redirection-redirecting input, "carr" and "clog" objects, IOS flags Template classes for Stack, vector, linked list.

**Text Books**

1. Object oriented programming in Turbo C++ by E. Balguruswami, McGraw Hill
2. Object oriented analysis and design with application by Grady Booch, Benjamin-Cummings Publishing Co

**Reference Web Sites**

1. www.cplusplus.com/doc/tutorial/
2. www.smartdraw.com/tutorials/software-uml/uml.html

**Practical Examination:**

The term work shall consist of at least 10 experiments/ assignments based on the syllabus above. The Practical Examination shall consist of writing and performing an experiment / assignment and oral based on the syllabus as per the journal record. Duration of examination is three hours. Assessment of term work should be done at the time of practical examination which will consider the points below and the marks should be awarded accordingly.

* Continuous lab assessment
* Actually performing practicals in the laboratory during the semester

**Suggestive List of Programs:**

1] Write a program to demonstrate different types of constructors.
2] Write a program for overloading various unary operators.

3] Write a program for overloading various binary operators.
4] Write a program for type conversion (basic to class, class to basic ,class to class)
5] Write a program for multiple inheritance
6] Write a program for hybrid inheritance
7] Write a program for polymorphism(virtual function)
8] Write a program for templates
9] Program using files
10] Program using streams

**Title of the subject: Mini Project**
**Course Code : CSE/IT- 2616**

**Teaching Scheme:** Practical: 2 hrs/week

**Examination Scheme :** Term Work: 50 Marks

**Objectives:**

- Develop the problem solving abilities
- Work in team
- Present the ideas, concepts into well documented system
- use the knowledge acquired in other subjects to solve a specific problem
- Use the programming skills for implementation
- develop a small working IT project

**Description of unit**

This unit is designed to form a central part in the development of the learner's ability to link and integrate the knowledge and skills acquired during the year to produce a practical solution to a realistic problem. This is a major piece of work that should demonstrate the performance expected at Second Year of Engineering . The chosen problem may be work-based, college-based or a learner interest based. But it must be developed in accordance with the unit's frameworks and constraints. This will develop the ability to produce a suitable, realistic software solution to an agreed specification within a defined timescale.

**Mini Project shall follow the steps:**

1 **Define** the **problem** with specifications
2 Define the **functionality** of the project
3 **Design** a **solution** for the project
4 **Implement the solution.** ( Also Keep a record of total number of man hours spent for the mini project.)
5 **Present and evaluate** the project.

**TERM Work:**

The term work shall consist of a report of this Mini project in typed form. The report should have all the necessary diagrams, charts, printouts and source code. The work has to be done in groups. The group size will vary from minimum **3 to** maximum **5** students per group.

The **suggestive format** of the report is as follows:

( Only one report should be submitted per group to the department. )

**Title** of the Mini Project:
Names & Roll Nos of the students:
Name of the guide:
Chapter 1: Introduction
Chapter 2: Requirement specifications
Chapter 3: Design and implementation
Chapter 4: Testing and evaluation
Chapter 5: Conclusion & future scope

The term work is to be evaluated by a group of two internal examiners which will consist of an **oral** along with the demonstration of the project. The oral examination will be conducted group-wise based on the mini project work. The internal examination should test the capabilities of the students.

**Suggestive List of Mini Projects:**

( Teachers are free to give different topics for the mini project. )

1. A package to learn the concepts of data structures
2. A package to show the demonstration of matrix operations
3. A package to show the information of a group of students in the class
4. A menu driven package for the data entry and operations for an organization
5. A computer game using graphics
6. A package to explain the 2-D transformations of graphics
7. A website using PHP, MySQL and HTML for a specific purpose
8. Creation of different animations using graphics tools.