PROPOSED
SYLLABUS
FOR
SECOND YEAR DEGREE COURSE IN COMPUTER SCIENCE
ENGINEERING AND INFORMATION TECHNOLOGY

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,
AURANGABAD

With effect from Academic Year 2012-2013
## FACULTY OF ENGINEERING AND TECHNOLOGY
### Proposed Revised Structure
#### [Second Year CSE/IT]
With effective from 2012-13

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<td>Total</td>
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L: Lecture hours per week  T: Tutorial hours per week  P: Practical hours per week  CT: Class Test  TH: University Theory Examination  TW: Term Work  PR: Practical/Oral Examination
DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,  
AURANGABAD  
FACULTY OF ENGINEERING AND TECHNOLOGY  
Second Year Engineering  
Semester-I  

BSH-201: Engineering Mathematics-III  

Teaching Scheme  

| Lectures | Theory | 4 Hrs/week | 80 Marks |
| Class Test | 20 Marks |
| Duration of Theory paper | 3Hrs |

Examination Scheme  

Objectives:  
1. To develop Logical understanding of the subject  
2. To develop mathematical skill so that students are able to apply mathematical methods & Principal’s in solving problems from Engineering fields  
3. To produce graduates with mathematical knowledge & computational skill.

Unit 1:  
[6 Hours]  
**Linear Differential Equations:** Linear Differential Equations with constant coefficients General method, shortcut methods to find particular integral, Homogenous Linear differential equations (Cauchy’s & Legendre’s form), method of variation of parameters.

Unit 2:  
[6 Hours]  
**Application of LDE:** To Electrical circuits & to Mechanical system (Analogous study of two systems), To Civil Engineering, Free oscillations / vibrations, Forced oscillation /vibrations, Damped Free oscillations / vibrations, Damped Forced oscillations / vibrations.

Unit 3:  
[8 Hours]  
**Statistics & Probability:** Measures of Dispersion, Moments, coefficient of skewness and Kurtosis, Probability distribution for random variables, Binomial, Poisson and Normal distributions, Curve fitting: Principle of least squares, Fitting of linear curve, parabola, exponential curve.

Unit 4:  
[6 Hours]  
**Vector Differentiation:** Differentiation of vectors, Gradient of scalar point function, Directional derivative, Divergence of vector point function, Curl of a vector point function. Irrotational and solenoidal vector field.
Unit 5: [6 Hours]

**Vector Calculus (Integral calculus):** The line integral, Surface integral, volume integral, Gauss Divergence theorem, Stoke’s theorem, Green’s theorem

Unit 6: [8 Hours]


**Note:** All Theorems are without proofs

**Section A:** Unit 1, 2, 3

**Section B:** Unit 4, 5, 6

**Reference Books:**


**Pattern of Question Paper:**

The units in the syllabus shall be divided in two equal sections. Question paper shall be set having two sections A and B. Section A questions shall be set on first three units (1,2,3) and Section B questions on remaining three units (4,5,6) . Question paper should cover the entire syllabus.

**For 80 marks Paper:**

1. Minimum ten questions
2. Five questions in each section
3. Question no 1 and 6 be made compulsory and should have at least ten bits of two marks out of which FIVE to be solved.
4. Two questions from remaining questions from each section be asked to solve having weightage of 15 marks
CSE-202: DIGITAL ELECTRONICS

Teaching Scheme

| Lectures | 4 Hrs/week |

Examination Scheme

| Theory | 80 Marks |
| Class Test | 20 Marks |
| Duration of Theory paper | 3Hrs |

Objectives:

- To understand different methods used for the simplification of Boolean functions
- To design and implement combinational circuits
- To design and implement synchronous sequential circuits
- To design and implement asynchronous sequential circuits

UNIT – 1  
5 Hours


UNIT – 2  
5 Hours


UNIT – 3  
10 Hours

UNIT – 4
6 Hours
Registers: Types of Registers, Serial In - Serial Out, Serial In - Parallel out, Parallel In - Serial Out, Parallel In - Parallel Out, Universal Shift Register, Applications of Shift Registers, Register Implementation in HDL

UNIT – 5
6 Hours
Counters: Asynchronous Counters, Decoding Gates, Synchronous Counters, Changing the Counter Modulus, Decade Counters, Presettable Counters, Counter Design as a Synthesis problem, A Digital Clock, Counter Design using HDL

UNIT – 6
8 Hours

Text Book:

Reference Books:

Section A: Unit 1, 2, 3
Section B: Unit 4, 5, 6

PATTERN OF QUESTION PAPER:
Six units in the syllabus shall be divided in two equal parts i.e. 3 units in each part. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

For 80 marks Paper:
1. Minimum ten questions
2. Five questions in each section
3. Question no 1 from section A and Question no 6 from section B having weightage of 10 marks each be made compulsory and should have at least eight bits of two marks out of which five to be solved.
4. Two questions from remaining questions from each section A and B be asked to solve each having weightage of 15 marks.
DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,
AURANGABAD

FACULTY OF ENGINEERING AND TECHNOLOGY

Second Year Engineering

Semester-I

CSE-203: DATA STRUCTURE USING C

Teaching Scheme

| Lectures | 4 Hrs/week |

Examination Scheme

| Theory | 80 Marks |
| Class Test | 20 Marks |
| Duration of Theory paper | 3 Hrs |

Objective:

- To study the representation, implementation and applications of data structures

UNIT - 1

6 Hours


UNIT - 2

4 Hours

ARRAYS and STRUCTURES: Arrays, Dynamically Allocated Arrays, Structures and Unions, Polynomials, Sparse Matrices, Representation of Multidimensional Arrays

UNIT - 3

10 Hours

STACKS AND QUEUES: Stacks, Stacks Using Dynamic Arrays, Queues, Circular Queues Using Dynamic Arrays, Evaluation of Expressions, Multiple Stacks and Queues.

LINKED LISTS: Singly Linked lists and Chains, Representing Chains in C, Linked Stacks and Queues, Polynomials, Additional List operations, Sparse Matrices, Doubly Linked Lists

UNIT - 4

10 Hours

TREES-1: Introduction, Binary Trees, Binary Tree Traversals, Threaded Binary Trees, Heap


UNIT - 5

5 Hours

UNIT-6


Text Book:
1. Horowitz, Sahni, Anderson-Freed, “Fundamentals of Data Structures in C,” 2nd Edition, Universities Press, 2007. (Chapters 1, 2.1 to 2.6, 3, 4, 5.1 to 5.3, 5.5 to 5.11, 6.1, 9.1 to 9.5, 10)

Reference Books:

Section A: Unit 1, 2, 3
Section B: Unit 4, 5, 6

PATTERN OF QUESTION PAPER:
Six units in the syllabus shall be divided in two equal parts i.e. 3 units in each part. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.
For 80 marks Paper:
1. Minimum ten questions
2. Five questions in each section
3. Question no 1 from section A and Question no 6 from section B having weightage of 10 marks each be made compulsory and should have at least eight bits of two marks out of which five to be solved.
4. Two questions from remaining questions from each section A and B be asked to solve each having weightage of 15 marks.
Second Year Engineering
Semester-I
CSE-204: COMPUTER NETWORKS-I

Teaching Scheme
Lectures 4 Hrs/week

Examination Scheme
Theory 80 Marks
Class Test 20 Marks
Duration of Theory paper 03 Hrs

Unit-1: [5 Hours]
Introduction: Data Communications, Networks, the Internet, Protocols & Standards, Layered Tasks,
The OSI model, Layers in OSI model, TCP/IP Protocol suite, addressing

Unit 2: [5 Hours]
Physical Layer-1: Analog & Digital Signals, Transmission Impairment, Data Rate limits, Performance, Digital-digital conversion (Only Line coding: Polar, Bipolar and Manchester coding), Analog-to-digital conversion (only PCM), Transmission Modes, Digital-to-analog conversion

Unit 3: [10 Hours]
Physical Layer-2 and Switching: Multiplexing, Spread Spectrum, Introduction to switching, Circuit Switched Networks, Datagram Networks, Virtual Circuit Networks
Data Link Layer-1: Error Detection & Correction: Introduction, Block coding, linear block codes, cyclic codes, Checksum.

Unit 4: [10 hours]
Data Link Layer-2: Framing, Flow and Error Control, Protocols, Noiseless Channels, Noisy channels, HDLC, PPP (Framing, Transition phases only)
Multiple Access & Ethernet: Random access, Controlled Access, Channelization, Ethernet: IEEE standards, Standard Ethernet, Changes in the standard, Fast Ethernet, Gigabit Ethernet

Unit 5: [5 hours]
Wireless LANs and Cellular Networks: Introduction, IEEE 802.11, Bluetooth, Connecting devices, Cellular Telephony

Unit 6: [5 hours]
Network Layer: Introduction, Logical addressing, IPv4 addresses, IPv6 addresses, Internetworking basics, IPv4, IPv6, Comparison of IPv4 and IPv6 Headers
Text Books:

Reference Books:

Section A: Unit 1, 2, 3
Section B: Unit 4, 5, 6

PATTERN OF QUESTION PAPER:
Six units in the syllabus shall be divided in two equal parts i.e. 3 units in each part. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

For 80 marks Paper:
1. Minimum ten questions
2. Five questions in each section
3. Question no 1 from section A and Question no 6 from section B having weightage of 10 marks each be made compulsory and should have at least eight bits of two marks out of which five to be solved.
4. Two questions from remaining questions from each section A and B be asked to solve each having weightage of 15 marks.
DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,
AURANGABAD
FACULTY OF ENGINEERING AND TECHNOLOGY
Second Year Engineering
Semester-I
CSE-205: UNIX AND SHELL PROGRAMMING

Teaching Scheme                          Examination Scheme
Lectures                                  Theory                   80 Marks
                                           Class Test               20 Marks
Duration of Theory paper                  3 Hrs

Unit-1:                                    [6 hours]
The Unix Operating System, The UNIX architecture and Command Usage,
The File System

Unit-2:                                    [6 Hours]
Basic File Attributes, the VI Editor, More file attributes,

Unit 3:                                    [8 Hours]
The Shell, The Process, Customizing the environment

Unit 4:                                    [8 Hours]
Simple filters, filters using regular expressions, awk – An Advanced Filter

Unit-5:                                    [6 Hours]
Essential Shell Programming

Unit 6:                                    [6 Hour]
perl - The Master Manipulator

Text Book:
McGraw Hill, 2006. (Chapters 1.2, 2, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 18, 19)

Reference Books:
Section A: Unit 1, 2, 3
Section B: Unit 4, 5, 6

PATTERN OF QUESTION PAPER:
Six units in the syllabus shall be divided in two equal parts i.e. 3 units in each part. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

For 80 marks Paper:
1. Minimum ten questions
2. Five questions in each section
3. Question no 1 from section A and Question no 6 from section B having weightage of 10 marks each be made compulsory and should have at least eight bits of two marks out of which five to be solved.
4. Two questions from remaining questions from each section A and B be asked to solve each having weightage of 15 marks.
Second Year Engineering
Semester-I
CSE-221: LAB-I: DIGITAL ELECTRONICS LABORATORY

Teaching Scheme
Practical: 2 Hrs/week

Examination Scheme
Term Work: 50 Marks

Term Work:
Term work shall consists of record of the experiments carried out during the course, which should include neat labeled figures and appropriate explanation for the corresponding experiment indicating what is learnt from the experiment. The term work shall consist of at least 10 experiments.

Assessment of term work should be done as follows:
- Continuous lab assessment: 40 %
- Actually performing practical in the laboratory: 40 %
- Oral Examination conducted (internally) at the time of submission: 20%

LIST OF EXPERIMENTS
1. Given a 4-variable logic expression, simplify it using Entered Variable Map and realize the simplified logic expression using 8:1 multiplexer IC.
2. Design and develop the Verilog /VHDL code for an 8:1 multiplexer. Simulate and verify its working.
4. Design and develop the Verilog / VHDL code for D Flip-Flop with positive-edge triggering. Simulate and verify its working.
5. Design and implement a mod-n (n<8) synchronous up counter using J-K Flip-Flop ICs and demonstrate its working.
6. Design and develop the Verilog / VHDL code for mod-8 up counter. Simulate and verify its working.
7. Design and implement a ring counter using 4-bit shift register and demonstrate its working.
8. Design and develop the Verilog / VHDL code for switched tail counter. Simulate and verify its working.
9. Design and implement an asynchronous counter using decade counter IC to count up from 0 to n (n<=9) and demonstrate its working.
10. Study & verification of operation of half and full Adder.
Design, develop and implement for the following problems using C Language in LINUX /Windows environment

1. Write a C program to implement stack using dynamic array.

2. Write a C program to implement 2 stacks in one static array.

3. Using circular representation for a polynomial, design, develop, and execute a program in C to accept two polynomials, add them, and then print the resulting polynomial.

4. Design, develop, and execute a program in C to convert a given valid parenthesized infix arithmetic expression to postfix expression and then to print both the expressions. The expression consists of single character operands and the binary operators + (plus), - (minus), * (multiply) and / (divide).

5. Design, develop, and execute a program in C to evaluate a valid postfix expression using stack. Assume that the postfix expression is read as a single line consisting of non-negative single digit operands and binary arithmetic operators. The arithmetic operators are + (add), - (subtract), * (multiply) and / (divide).

6. Design, develop, and execute a program in C to simulate the working of a queue of integers using an array. Provide the following operations:
   a. Insert   b. Delete   c. Display

7. Design, develop, and execute a program in C to read a sparse matrix of integer values and to search the sparse matrix for an element specified by the user. Print the result of the search appropriately. Use the triple <row, column, value> to represent an element in the sparse matrix

8. Design, develop, and execute a program in C to create a max heap of integers by accepting one element at a time and by inserting it immediately in to the heap. Use the array representation for the heap. Display the array at the end of insertion phase.
9. Design, develop, and execute a program in C to implement a doubly linked list where each node consists of integers. The program should support the following operations:
   a. Create a doubly linked list by adding each node at the front.
   b. Insert a new node to the left of the node whose key value is read as an input.
   c. Delete the node of a given data if it is found, otherwise display appropriate message.
   d. Display the contents of the list.
      (Note: Only either (a,b and d) or (a, c and d) may be asked in the examination)

10. Write a C program to construct binary tree & binary tree traversal.

11. Write a C program to construct binary search tree.

**Practical Examination:**
Practical Examination should be conducted for three hours under the supervision of external examiner. External examiner should evaluate student by practically and orally.

**Note:** In the examination each student picks one question from a lot of all the 11 question
DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, 
AURANGABAD 
FACULTY OF ENGINEERING AND TECHNOLOGY 
Second Year Engineering 
Semester-I 
CSE-223: LAB-III: COMPUTER NETWORKS-I LABORATORY 

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<th>Examination Scheme</th>
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<td>Practical: 2 Hrs/week</td>
<td>Term Work: 50 Marks</td>
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Term Work: 
Term work shall consists of record of the experiments carried out during the course, which should include appropriate explanation for the corresponding experiment indicating what is learnt from the experiment. The term work shall consist of at least 10 experiments.

Assessment of term work should be done as follows:
- Continuous lab assessment: 40%
- Actually performing practical in the laboratory: 40%
- Oral Examination conducted (internally) at the time of submission: 20%

LIST OF EXPERIMENTS 

1. Study of Data Communication and Networking. Identify five components of Data communication system. 
2. Study of computer network topology and OSI model layered architecture. 
3. Installation of TC/IP protocol configuration and study the classification of addresses employing TCP/IP protocols. 
4. Write a C program to determine if the IP address is in Class A, B, C, D, or E. 
5. Write a C program to translate dotted decimal IP address into 32 bit address. 
6. Study of basic network commands: ipconfig, hostname, ping <ip_address>, tracert <ip_address>, netstat<ip_address> etc.. 
7. To establish a straight over and a cross over cable in LAN 
8. Study of Digital-Digital Conversion and Analog-Digital Conversion 
10. Write a C program to generate Hamming code. 
11. Study of IEEE Standards 
12. Study of IEEE 802.11 wireless standard 
13. Study of IPv4 and IPv6
LIST OF EXPERIMENTS

1. Execution of various file/directory handling commands.
2. Simple shell script for basic arithmetic and logical calculations.
3. Shell scripts to check various attributes of files and directories.
4. Shell scripts to perform various operations on given strings.
5. Shell scripts to explore system variables such as PATH, HOME etc.
6. Shell scripts to check and list attributes of processes.
7. Execution of various system administrative commands.
8. Write awk script that uses all of its features.
9. Use seed instruction to process /etc/password file.
10. Write a shell script to display list of users currently logged in.
11. Write a shell script to delete all the temporary files.
12. Write a shell script to search an element from an array using binary searching.

Practical Examination:
Practical Examination should be conducted for three hour under the supervision of external examiner. External examiner should evaluate student by practically and orally. Note: In the examination each student picks one question from a lot of all the 12 question
CSE 225: LAB-V: INTRODUCTION TO WEB PROGRAMMING

Teaching Scheme
Practical: 2 Hrs/week
Theory: 2 Hrs/week

Examination Scheme
Practical/Oral: 50 Marks

Contents


2. **URLs Types of URLs**: Absolute URLs, Relative URLs. Linking HTML Documents: The Anchor tag, Linking to document in same folder, Linking to document in Different folder, Linking to document on the web, Linking to specific location within document. Inserting E-mail links Including Images: Image formats Linking HTML Documents: The Anchor tag, Linking to document in same folder, Linking to document in Different folder, Linking to document on the web, Linking to specific location Within document.  **4 hours**

3. **Inserting E-mail links tables, Forms, Frames**: Tables: Creating Tables, Editing of rows and columns of table, rowspan, colspan, formatting tables using attributes border, Border colour, back ground, align, width, cell spacing, cell height. Forms: Creating Forms, Forms controls: text controls, Password fields, Radio Buttons, Check boxes, Reset and Submit buttons. The `<TEXTAREA>`, `<SELECT>` and `<OPTION>` tags.  **3 hours**

4. **Frames**: Introduction to frames, Advantages and disadvantages of frames, creating basic frames Frame targeting. Style sheets: Adding style sheet to document: Linking to a Style sheet, Embedding style sheet, Using inline Style sheet Building a small web site  **3 hours**

5. **JavaScript**: Introduction to JavaScript, difference between Java and JavaScript, JavaScript syntax, variables and their types, JavaScript operators, arrays and array methods, Program flow: Control statements, exercise, Built-in objects in JavaScript, Array, String, Math, Date objects, documents forms and form elements window location, History object.  **6 hours**
Reference Books:

LIST OF EXPERIMENTS

1. Design a home page which will display your information i.e Bio data.
2. Create Hyperlinks in home page i.e educational details, Hobbies, Achievement, My Ideals etc.
3. Use table tag to format web page. Also display educational details in tabular format.
4. Create Style sheet to set formatting for text tags. Use it in above pages.
5. Design signup form to validate username, password, phone numbers etc .using Java script.
6. Design a sign up form information in database. Perform change password operation on it.
7. Develop and demonstrate a DHTML file that includes Javascript for the following problems:
   a. Input : A number n obtained using prompt
      Output: The factorial of a number n
   b. Input : A number n obtained using prompt
      Output: The first n Fibonacci numbers
8. Develop and demonstrate a DHTML file the includes JavaScript for using various menu items and submenu items.
9. Design a web page for departmental information system.
10. Design and Develop a shopping cart using HTML and JavaScript.

Practical Examination:

Practical Examination should be conducted for three hours under the supervision of external examiner. External examiner should evaluate student by practically and orally.

Note: In the examination each student picks one question from a lot of all the 10 question.
DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,
AURANGABAD
FACULTY OF ENGINEERING AND TECHNOLOGY
Second Year Engineering
Semester-II
BSH-252: Engineering Mathematics-IV

Teaching Scheme
Lectures 4 Hrs/week

Examination Scheme
Theory 80 Marks
Class Test 20 Marks
Duration of Theory paper 3Hrs

Objectives:
1. To develop Logical understanding of the subject
2. To develop mathematical skill so that students are able to apply mathematical methods & Principal’s in solving problems from Engineering fields
3. To produce graduates with mathematical knowledge & computational skill.

Unit-1:
[7 Hours]
Function of complex variable (Differential calculus): Introduction, Analytic function Cauchy Riemann equations in Cartesian and Polar form, Harmonic function, Taylor’s series & Laurent’s series (without proof), Conformal mapping (geometrical representation of function of complex variable), bilinear transformation.

Unit 2:
[7 Hours]
Function of complex variable: (Integral calculus): Line integral, contour integral: Cauchy’s integral theorem, Cauchy’s integral formula (without proof), Residues, Cauchy’s residue theorem, Integration along unit circle and along upper half of semi circle.

Unit 3:
[6 Hours]
Z Transform: Definition, Z transform of elementary functions, properties of Z transform, Inverse Z transform, Solution of difference equation by Z transform.
Unit 4: [6 Hours]
Laplace transform: Definition, Transforms of elementary functions, Properties & theorems of Laplace transforms (without proof), transforms of periodic function, Heaviside unit step function, displaced unit step function, Dirac delta function, error function, Bessel’ function of zero order.

Unit 5: [6 Hours]
Inverse Laplace transform and its applications: Inverse Laplace transforms by using (i) properties, (ii) partial fractions, (iii) Convolution theorem, Applications to solve linear differential equations with constant coefficients (Initial value problems), Simultaneous Linear differential equations.

Unit 6: [8 Hours]
Fourier Transform and its applications: Fourier integral, Fourier sine and cosine integral, complex form of Fourier integral, Fourier transforms Fourier sine and cosine transform and inverse Fourier transforms Finite Fourier sine and cosine transforms. Solution of one dimensional heat equation by using Fourier transform.

Note: All Theorems are without proofs

Section A: Unit 1, 2, 3

Section B: Unit 4, 5, 6

Reference Books:

Pattern of Question Paper:
The units in the syllabus shall be divided in two equal sections. Question paper shall be set having two sections A and B. Section A questions shall be set on first three units (1,2,3) and Section B questions on remaining three units (4,5,6). Question paper should cover the entire syllabus.
For 80 marks Paper:

1. Minimum ten questions

2. Five questions in each section

3. Question no 1 and 6 be made compulsory and should have at least ten bits of two marks out of which FIVE to be solved.

4. Two questions from remaining questions from each section be asked to solve having weightage of 15 marks
CSE-253: DISCRETE MATHEMATICS

**Teaching Scheme**

<table>
<thead>
<tr>
<th>Lectures</th>
<th>4 Hrs/week</th>
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**Examination Scheme**

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<th>Theory</th>
<th>80 Marks</th>
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</thead>
<tbody>
<tr>
<td>Class Test</td>
<td>20 Marks</td>
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<tr>
<td>Duration of Theory paper</td>
<td>3 Hrs</td>
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</tbody>
</table>

**Course Objectives:**

Students will learn the essential mathematic concepts and ideas in discrete mathematics, which are required for rigorous studies in most areas in computer science. After completing this course satisfactorily, a student will be:

1. Able to construct simple mathematical proofs and possess the ability to verify them
2. Able to understand logical arguments and logical constructs
3. Have a better understanding of sets, functions, and relations.
4. Acquire ability to describe computer programs in a formal mathematical manner.
5. Possess the mathematical knowledge and maturity that are required for upper level computer.

**UNIT-1**

*Set Theory:* Sets and Subsets, Set Operations and the Laws of Set Theory, Counting and Venn Diagrams, A First Word on Probability, Countable and Uncountable Sets

**UNIT – 2**


**UNIT-3**

*Fundamentals of Logic contd.:* The Use of Quantifiers, Quantifiers, Definitions and the Proofs of Theorems.


**UNIT-4**

*Relations and Functions:* Cartesian Products and Relations, Functions – Plain and One-to-One, Onto Functions – Stirling Numbers of the Second Kind, Special Functions, The Pigeon-hole Principle, Function Composition and Inverse Functions
Relations contd.: Properties of Relations, Computer Recognition – Zero-One Matrices and Directed Graphs, Partial Orders – Hasse Diagrams, Equivalence Relations and Partitions

UNIT – 5

Groups: Definitions, Examples, and Elementary Properties, Homomorphisms, Isomorphisms, and Cyclic Groups, Cosets, and Lagrange’s Theorem.

Coding Theory and Rings: Elements of Coding Theory, The Hamming Metric, The Parity Check, and Generator Matrices

Unit – 6

Group Codes: Decoding with Coset Leaders, Hamming Matrices

Rings and Modular Arithmetic: The Ring Structure – Definition and Examples, Ring Properties and Substructures, The Integers Modulo n

Text Book:


Reference Books:

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AURANGABAD
FACULTY OF ENGINEERING AND TECHNOLOGY
Second Year Engineering
Semester-II
CSE-254: OBJECT ORIENTED PROGRAMMING USING C++

Teaching Scheme               Examination Scheme

<table>
<thead>
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<th>Lectures</th>
<th>4 Hrs/week</th>
<th>Theory</th>
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<td>Class Test</td>
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<tr>
<td></td>
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<td>Duration of Theory paper</td>
<td>03 Hrs</td>
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</table>

Unit-1: [5 Hours]

**Introduction:** Overview of C++, Sample C++ program, Different data types, operators, expressions, and statements, arrays and strings, pointers & user-defined types.

Function Components, argument passing, inline functions, function overloading, recursive functions.

Unit-2: [10 Hours]

**Classes & Objects – I:** Class Specification, Class Objects, Scope resolution operator, Access members, Defining member functions, Data hiding, Constructors, Destructors, Parameterized constructors, Static data members, Functions

Friend functions, passing objects as arguments, Returning objects, Arrays of objects, Dynamic objects, Pointers to objects, Copy constructors, Generic functions and classes, Applications

Operator overloading using friend functions such as +, -, pre-increment, post-increment, [ ] etc., overloading <<, >>.

Unit-3: [5 Hours]

**Inheritance-I:** Base Class, Inheritance and protected members, protected base class inheritance, inheriting multiple base classes,

Unit-4 [5 Hours]

**Inheritance-II:** Constructors, Destructors and Inheritance, Passing parameters to base class constructors, Granting access, Virtual base classes.

Unit-5: Virtual functions, Polymorphism: [5 Hours]

Virtual function, calling a Virtual function through a base class reference, Virtual attribute is inherited, Virtual functions are hierarchical, pure virtual functions, Abstract classes, Using virtual functions, Early and late binding.
Unit-6: System Basics, File I/O, Exception Handling, STL: [10 Hours]
C++ stream classes, Formatted I/O, I/O manipulators, fstream and the File classes, File operations Exception handling fundamentals, Exception handling options STL: An overview, containers, vectors, lists, maps.

Text Books:

Reference Books:

Section A: Unit 1, 2, 3
Section B: Unit 4, 5, 6

PATTERN OF QUESTION PAPER:
Six units in the syllabus shall be divided in two equal parts i.e. 3 units in each part. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.
For 80 marks Paper:
1. Minimum ten questions
2. Five questions in each section
3. Question no 1 from section A and Question no 6 from section B having weightage of 10 marks each be made compulsory and should have at least eight bits of two marks out of which five to be solved.
4. Two questions from remaining questions from each section A and B be asked to solve each having weightage of 15 marks.
Unit – I 
[5 Hours]

Unit – 2 
[5 Hours]
Microprocessor Architecture – 2, Addressing Modes: Introduction to Protected Mode Memory Addressing, Memory Paging, Flat Mode Memory Addressing Modes: Data Addressing Modes, Program Memory Addressing Modes, Stack Memory Addressing Modes

Unit – 3 
[10 Hours]
Programming – 1: Data Movement Instructions: MOV Revisited, PUSH/POP, Load-Effective Address, String Data Transfers, Miscellaneous Data Transfer Instructions, Segment Override Prefix, Assembler Details. Arithmetic and Logic Instructions: Addition, Subtraction and Comparison, Multiplication and Division.

Unit - 4 
[7 Hours]
Hardware Specifications, Memory Interface – 1: Pin-Outs and the Pin Functions, Clock Generator, Bus Buffering and Latching, Bus Timings, Ready and Wait State, Minimum versus Maximum Mode. Memory Interfacing: Memory Devices
Unit – 5  [6 Hours]
Memory Interface – 2, I/O Interface – 1: Memory Interfacing (continued): Address Decoding, 8088 Memory Interface, 8086 Memory Interface. Basic I/O Interface: Introduction to I/O Interface, I/O Port Address Decoding.

Unit -6  [7 Hours]

Text Book:

Reference Books:

Section A: Unit 1, 2, 3
Section B: Unit 4, 5, 6

PATTERN OF QUESTION PAPER:
Six units in the syllabus shall be divided in two equal parts i.e. 3 units in each part. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

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4. Two questions from remaining questions from each section A and B be asked to solve each having weightage of 15 marks.
Teaching Scheme | Examination Scheme
--- | ---
Lectures | Theory | 80 Marks
Tutorial | Class Test | 20 Marks
--- | --- | ---
Duration of Theory paper | 03 Hrs

Objectives:
After completing this course, students will be able to
- Identify and explain the core concepts of computer graphics.
- Apply graphics programming techniques to design, and create computer graphics scenes.

Unit 1: Introduction: | 5 hours
Applications of computer graphics; A graphics system; Images: Physical and synthetic; Imaging Systems; The synthetic camera model; The programmer’s interface; Graphics architectures; Programmable Pipelines; Performance Characteristics
Graphics Programming: The Sierpinski gasket; Programming Two Dimensional Applications.

Unit 2: The OpenGL: | 4 hours
The OpenGL API; Primitives and attributes; Color; Viewing; Control functions; The Gasket program; Polygons and recursion; The three- dimensional gasket; Plotting Implicit Functions

Unit 3: Input and Interaction: | 11 hours
Interaction; Input devices; Clients and Servers; Display Lists; Display Lists and Modeling; Programming Event Driven Input; Menus; Picking; A simple CAD program; Building Interactive Models; Animating Interactive Programs; Design of Interactive Programs; Logic Operations

Geometric Objects and Transformations-I:
Scalars, Points, and Vectors; Three-dimensional Primitives; Coordinate Systems and Frames; Modeling a Colored Cube; Affine Transformations; Rotation, Translation and Scaling;

Unit 4 | 4 hours
Geometric Objects and Transformations-II: Geometric Objects and Transformations; Transformation in Homogeneous Coordinates; Concatenation of
Transformations; OpenGL Transformation Matrices; Interfaces to three-dimensional applications; Quaternion’s.

Unit 5: Viewing: 10 hours
Classical and computer viewing; Viewing with a Computer; Positioning of the camera; Simple projections; Projections in OpenGL; Hidden-surface removal; Interactive Mesh Displays; Parallel-projection matrices; Perspective-projection matrices; Projections and Shadows.

Hours Lighting and Shading: Light and Matter; Light Sources; The Phong Lighting model; Computation of vectors; Polygonal Shading; Approximation of a sphere by recursive subdivisions; Light sources in OpenGL; Specification of materials in OpenGL; Shading of the sphere model; Global Illumination.

Unit 6: Implementation: 6 hours
Basic Implementation Strategies; Four major tasks; Clipping; Line-segment clipping; Polygon clipping; Clipping of other primitives; Clipping in three dimensions; Rasterization; Bresenham’s algorithm; Polygon Rasterization; Hidden-surface removal; Antialiasing; Display considerations.

Text Books:

Reference Books:

Section A: Unit 1, 2, 3
Section B: Unit 4, 5, 6

PATTERN OF QUESTION PAPER:
Six units in the syllabus shall be divided in two equal parts i.e. 3 units in each part. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

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DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,
AURANGABAD

FACULTY OF ENGINEERING AND TECHNOLOGY

Second Year Engineering

Semester-II

CSE-271: LAB-VI: OBJECT ORIENTED PROGRAMMING USING
C++ LABORATORY

Teaching Scheme
Practical:  2 Hrs/week

Examination Scheme
Practical/Oral: 50 Marks

LIST OF EXPERIMENTS

1. Design, develop, and execute a program in C++ based on the following requirements:
   An EMPLOYEE class is to contain the following data members and member functions: Data members: Employee_Number (an integer), Employee_Name (a string of characters), Basic_Salary (an integer), All_Allowances (an integer), IT (an integer), Net_Salary (an integer).
   Member functions: to read the data of an employee, to calculate Net_Salary and to print the values of all the data members. (All_Allowances = 123% of Basic; Income Tax (IT) = 30% of the gross salary (= basic_Salary – All_Allowance);
   Net_Salary = Basic_Salary + All_Allowances – IT)

2. Design, develop, and execute a program in C++ to create a class called STRING and implement the following operations. Display the results after every operation by overloading the operator ‘<<’.
   i. STRING s1 = “BAMU”
   ii. STRING s2 = “AURANGABAD”
   iii. STRING s3 = s1 + s2; (Use copy constructor)

3. Design, develop, and execute a program in C++ to create a class called DATE with methods to accept two valid dates in the form dd/mm/yy and to implement the following operations by overloading the operators + and -. After every operation the results are to be displayed by overloading the operator ‘<<’.
   i. no_of_days = d1 – d2; where d1 and d2 are DATE objects, 
      d1 >=d2 and no_of_days is an integer.
   ii. d2 = d1 + no_of_days; where d1 is a DATE object and no_of_days is an integer.

4. Design C++ classes with static members, methods with default arguments, friend functions. (For example, design matrix and vector classes with static allocation, and a friend function to do matrix-vector multiplication)
5. Implement complex number class with necessary operator overloading and type conversions such as integer to complex, double to complex, complex to double etc.

6. Implement Matrix class with dynamic memory allocation and necessary methods. Give proper constructor, destructor, copy constructor, and overloading of assignment operator.

7. Overload the new and delete operators to provide custom dynamic allocation of memory.

8. Develop a template of linked-list class and its methods.

9. Develop templates of standard sorting algorithms such as bubble sort, insertion sort; merge sort, and quick sort.

10. Design stack and queue classes with necessary exception handling.

11. Practical based on implementation of various types of inheritance

**Practical Examination:**

Practical Examination should be conducted for three hours under the supervision of external examiner. External examiner should evaluate student by practically and orally.

*Note: In the examination each student picks one question from a lot of all the 11 question*
LIST OF EXPERIMENTS

1. Study of MASM/TASM.
2. Write an assembly language program to perform 8 bit, 16 bit addition.
3. Write an assembly language program to perform 8 bit, 16 bit subtraction.
4. Write an assembly language program to perform negative result subtraction.
5. Write an assembly language program to perform 8 bit, 16 bit Multiplication.
6. Write an assembly language program to perform 16 bit by 8 bit division
7. Write an assembly language program to check whether entered number is even or odd.
8. Write an assembly language program to calculate average of temperatures.
9. Write an assembly language program to perform sum of digits for 2, 3 digits numbers.
10. Write an assembly language program to perform conversion from two ASCII no’s to packed BCD.
11. Write an assembly language program to perform conversion from BCD to Hex.
12. Write an assembly language program to interface stepper motor.(application)
13. Write an assembly language program to interface LED (application)

Practical Examination:
Practical Examination should be conducted for three hours under the supervision of external examiner. External examiner should evaluate student by practically and orally.

Note: In the examination each student picks one question from a lot of all the 13 question
Teaching Scheme | Examination Scheme
Practical: 2 Hrs/week | Term Work: 50 Marks

Term Work:
Term work shall consist of record of the experiments carried out during the course, which should include appropriate explanation for the corresponding experiment indicating what is learnt from the experiment. The term work shall consist of at least 10 experiments.
Assessment of term work should be done as follows:
  * Continuous lab assessment: 40 %
  * Actually performing practical in the laboratory: 40 %
  * Oral Examination conducted (internally) at the time of submission: 20 %

LIST OF EXPERIMENTS

1. Study of basic graphics functions defined in “graphics.h”.
5. Implement Polygon filling algorithms.
6. Programs using 2-D transformations.
7. Programs to study window to viewport transformations.
9. Programs to study 3-D transformations.
10. Program to create a simple and proper “User Interface” for a defined application.
CSE-274: LAB-IX: OPEN SOURCE LABORATORY

Teaching Scheme | Examination Scheme
---|---
Lectures | 2 Hrs/week | Practical & Oral : 50 Marks
Practical | 2 Hrs/week

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

Unit 1: Linux and Open Source | 3 hours
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 Permission

Unit 2: Linux Administration | 3 hours
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 | 4 hours
Accessing and Running applications: cc complier, gee complier, Mozilla Firefox.
Multimedia in Linux: Listening to audio, Playing video, Using digital camera, Recording musics / video CDs.

Unit 4: Apache and PHP | 4 hours
Introduction to the web server .installing Apache on Linux: httpd service.
PHP: testing installation basics of PHP scripts, variables Data types, Operators and – Constants, flow control functions, if statement, loops arrays, strings, Dates and times-
Unit 5: MySQL, server, and Application 3 hours
MySQL: configuration MySQL server, working with MySQL Databases, MySQL Tables,
Commands – INSERT, SELECT, UPDATE, REPLACE, DELETE. Date and Time function MySQL.

Unit 6: PHP 3 hours
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:

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
<th>Pub</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Red Hat Linux Bible</td>
<td>Christopher Negus</td>
<td>Wiley Publishing ISBN : 0-7645-4333-4</td>
</tr>
<tr>
<td>3 The Complete Reference Linux</td>
<td>Peterson</td>
<td>Tata McGRAW HILL ISBN : 0-07-044489-7</td>
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Internet Resources:

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<td>1</td>
<td>Open Source Phenomenon</td>
<td><a href="http://opensource.org/">http://opensource.org/</a></td>
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<tr>
<td>2</td>
<td>Open Source Technology :</td>
<td><a href="http://www-">http://www-</a></td>
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<td>3</td>
<td>Open Source : Benefits</td>
<td><a href="http://www.sun.com/software/opensource/">http://www.sun.com/software/opensource/</a></td>
</tr>
<tr>
<td></td>
<td>- Michael Jordan</td>
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</tbody>
</table>
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

Practical Examination:

Practical Examination should be conducted for three hours under the supervision of external examiner. External examiner should evaluate student by practically and orally.

Note: In the examination each student picks one experiment based on above Concept.
DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,
AURANGABAD

FACULTY OF ENGINEERING AND TECHNOLOGY

Second Year Engineering

Semester-II

BSH 275: Communication Skills

<table>
<thead>
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<th>Teaching Scheme</th>
<th>Examination Scheme</th>
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<td>Practical: 2 Hrs/week</td>
<td>Term work: 50 Marks</td>
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<td>Theory: 2 Hrs/week</td>
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**BOS in Computer Science & Engineering/Information Technology**

Equivalent subjects at SE (CSE/IT) – I & II Pre-revised course to the Revised Course of S. E. (CSE/IT) Sem – III & IV.

**SE (CSE) Part – I**

<table>
<thead>
<tr>
<th>SE (CSE) –I (Pre-Revised)</th>
<th>Equivalent / Replacement subject</th>
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<tbody>
<tr>
<td>1  Engineering Mathematics-III</td>
<td>Engineering Mathematics-III</td>
</tr>
<tr>
<td>2  Discrete Mathematics</td>
<td>Discrete Mathematics of S.E(CSE) Sem-IV (Revised)</td>
</tr>
<tr>
<td>3  Data Structures using C</td>
<td>Data Structures using C</td>
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<tr>
<td>4  Data communication</td>
<td>Computer Networks-I of S.E.(CSE) Sem-III (Revised)</td>
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<tr>
<td>5  Digital Electronics</td>
<td>Digital Electronics</td>
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<tr>
<td>6  Advance C Programming Lab</td>
<td>LAB-V Introduction to web programming of S.E.(CSE) Sem-III (Revised)</td>
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<td>7  Communication Skills</td>
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**SE (CSE) Part – II**

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<th>SE (CSE) –I (Pre-Revised)</th>
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<tr>
<td>1  Engineering Mathematics-IV</td>
<td>Engineering Mathematics-III</td>
</tr>
<tr>
<td>2  Open Source Software Technology</td>
<td>Unix and Shell Programming of S.E(CSE) Sem-III (Revised)</td>
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<tr>
<td>3  Computer graphics</td>
<td>Computer graphics</td>
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<td>4  Micro processors and Computer organization</td>
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<tr>
<td>5  Object Oriented Programming(using c++)</td>
<td>Object Oriented Programming with C++ Lab</td>
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<tr>
<td>6  Mini Project</td>
<td>LAB-IX Open Source Lab</td>
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<tr>
<td>7  Communication Skills</td>
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