



Subject Code: - MAT010

Subject Name: - Introduction to Engineering Mathematics with Applications– I

Semester: I

L	T	P	C
3	1	-	4

Course Objectives:

Revise basic knowledge of Functions and Differentiation with application. Revise basic knowledge of Indefinite and definite Integrals. Revise basic knowledge of Sequences and Series. To know about the uses of differential equations in practical problems. Basic knowledge of Algebra of Logic, Boolean algebra, Graph Theory and Fuzzy Logic.

Differential Calculus

Functions: Introduction of Functions, Concept of real function, types of functions, Applications of functions, Composite functions, its domain and range.

Limit: Introduction, fundamental theorems on Limits, Operation on Limits, Functions in the real world Limits, Continuity, Infinity.

Differentiation: Introduction, the beginning of derivatives, Techniques of differentiation, Chain rule, Derivatives of Trigonometric functions, Derivatives in the real world, Antidifferentiation, Expansion of functions, Maxima and Minima of functions of one variable.

Integral Calculus

Integration: Introduction, fundamental theorem of Calculus, Techniques of Integration, Substitution rule.

Indefinite Integral: Basics of Indefinite Integral and its properties, Substitution, Integration using Trigonometric Identity & Integration by parts.

Definite Integrals: Basics of Definite Integral and its properties, Definite Integrals as a Limit of a sum, Application in summation of series.

Sequences and Series

Sequences: Introduction, Some examples of Sequences, Limit of a Sequence.

Series: Arithmetic Progression (AP), Examples of AP and insertion of Arithmetic means, Geometric Progression (GP), Sum to infinity of a GP, Arithmetico-geometric sequence, Sum to n terms of special sequences, Exponential series, Logarithmic series.

Ordinary Differential Equations

First-order differential equations (Separable, Exact, Homogeneous, Linear), Linear differential equations of higher order with constant coefficients, Homogeneous differential equations, Simultaneous linear differential equations.

Algebra of Logic, Boolean Algebra, Graph Theory and Fuzzy Logic

Algebra of Logic: Introduction, Logical Connectives, Elementary operations of Logic.

Boolean Algebra: Introduction, Principle of Duality, Basic Theorems, Boolean Expressions and Functions, Switching Circuit Algebra.

Graph Theory: Introduction, Graphs, Sub-graphs, Degree and Distance, Basic Theorems, Types of Graphs, Tree, Cycles and Network.

Fuzzy Logic: Introduction, Elementary concept of Fuzzy Logic, Applications of Fuzzy logic.

Course Outcomes:

Student learns about the use of Functions and Differentiation in daily life. Optimum solutions and Modeling of the functions. Student learns about the use of Indefinite and definite Integrals in daily life. Basic fundamentals of used in various fields of Engineering. Student learns about the use of Sequences and Series in daily life, various practical problems and further uses. Student will learn about the basic application of differential equations in various practical problems and further uses. Useful for field of Network analysis, Digital Electronics, Network synthesis Neural Network.

References:-

- (i) Advance Engg. Mathematics, By Ramana, Tata McGraw hill.
- (ii) Advance Engineering Mathematics by D. G. Guffy.
- (iii) Engineering Mathematics by S S Sastri. P.H.I.



Subject Code: - EEE150

Subject Name: - Electrical and Electronics Materials

Semester: I

L	T	P	C
4	-	-	4

Course Objectives:

Students should have knowledge of various classes of materials like solid, liquid, gaseous, conducting, insulating and resistive along with their basic characteristics.

Unit I

Classes of Engineering Materials: Metals & alloys, ceramics, organic polymers and composite material. Classification of solids from electrical engineering point of view. Conducting material: properties of conductors, characteristics of good conducting material, commonly used conducting materials, conductor materials for overhead lines, types of conductors, conductor for underground cables, conductor used for electrical machines winding, resistor materials, types of resistors, materials for bus bar. Thermal conductivity of matter, super conductivity. Materials of MHD generator, fuel cells, thermoelectric generators, thermionic conductors.

Unit II

Dielectric Materials: Dielectric strength, factors affecting dielectric strength, dielectric loss, dissipation factor, factors affecting dielectric loss, permittivity & polarization, charging and discharging of dielectric, conduction through dielectric. Application of dielectric, different types of capacitors and materials used for them. Insulating materials, their properties: thermal, chemical, mechanical & electrical. Insulating materials like ceramic, mica, glass, rubber, resins, wax varnishes, class of insulation. Transformer oils & their testing. Piezoelectricity & ferro electricity.

Unit III

Applications of Semi Conductor Materials: Type of semi conductors, working and applications of semiconductors, temperature sensitive elements, photoconductive cells, photo voltaic cells; varistor, Hall Effect generator, piezo – electric materials, semiconductor laser and its characteristics.

Unit IV

Classification of Magnetic Materials: Diamagnetism, para magnetism, ferro- magnetism, magnetization curve, hysteresis loop, magnetostriction, factors affecting permeability and hysteresis, anti-ferromagnetism, ferromagnetism, magnetic resonance, B-H curve for different magnetic materials, loss of magnetism, impurities in ferromagnetic materials, soft and hard magnetic materials, ferrites. Fiber optic materials, lasers special purpose materials, thermo couple, soldering, fuse, contact, refractory, fluorescent & phosphorescent, galvanizing and impregnation.

Course Outcomes:

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

- Categorize and classify different materials from Electrical Engineering applications point of view.

- Explain and summarize various properties and characteristics of different classes of materials.
- Choose materials for application in various electrical equipment.
- Test different classes of materials as per IS.

References:-

1. C. S. Indulkar and S. Thruvengadem; Electrical Engineering Materials; S. Chand.
2. A.J. Dekkor; Electrical Engineering Materials; PHI.
3. John Allison; Electrical Engineering Material s & Devices; TMH.
4. Kasap; Electronic Materials and devices; TMH
5. V. Raghvan; Material Science & Engineering; PHI.
6. Milman & Grabe; Micro Electronics; TMH
7. TTTI Madras; Electrical Engineering Materials; TMH.
8. S.P. Seth & P.V. Gupta; Electrical Engineering Materials; Dhanpat Rai.



Subject Code: - CSS010

Subject Name: - Business Communication & Presentation Skills

Semester: I

L	T	P	C
2	1	2	4

Course Objectives:

Communication skills are important for many professions but are crucial for students to develop their personality. They must be able to adapt their methods of communication to all regardless of ability or learning style.

- Students will demonstrate competency in communication skills related to production and presentation of messages and documents in multiple formats.
- Students will demonstrate competency in critical thinking skills related to the analysis, interpretation, and criticism of any message either verbal or non-verbal.
- Students will demonstrate an understanding of multiple theoretical perspectives and diverse intellectual traditions in formal and informal communication.
- Students will demonstrate competency in the analysis and practice of ethical communication.
- Students will demonstrate understanding to the importance of free expression and the responsibilities it entails.

Unit – I

Fundamentals of Language & Vocabulary

Applied Grammar and usages - Parts of Speech, Determiners, Tenses, Subject-Verb Agreement, Prepositions, Active and Passive Voice, **Reported Speech:** Direct and Indirect, Sentence Structure, Punctuations.

Vocabulary: Origin of words, affixation, Antonyms, Synonyms, one-word substitute, phrasal verbs, idioms, proverbs and jargons.

Unit – II

Application of Linguistic ability

Linguistic techniques, English phonetic symbols or signs, Phonetic Transcription, Writing of Definitions of Related terms, objects, processes and principles, Paragraph writing, Precise writing and noting.

Unit – III

Skills of Communication

Scope and Significance of Communication Skills, Process of Communication in an Organisation, Types of Communication: Verbal and Non-Verbal Communication, Formal and Informal Channels of Communication, Barriers to communication, Measures to overcome Barriers, Need for Effective Communication, Listening skills.

Unit – IV

Developing Writing Skills

Business Letters: Parts & Layouts of Business Letters, Calling/ Sending Quotations/ Tenders/Orders/ Complaints, Report Writing (Progress, Observation, Survey, Project and Laboratory).

Unit – V

Employability and Corporate Skills

Interview skills, Group Discussion, Job Application, CV Writing, Memos and Email writing, Time management and Effective Planning, Negotiation skills, Teamwork, leadership.

Course Outcomes:

- Students will be enriched with good vocabulary and diction.
- Students will be able to comprehend the process of communication and its components.
- Students will be able to improve the language skills such as Listening, Speaking, Reading and Writing.
- Students will be able to enhance phonetic competence, comprehension skills, presentation skills, soft skills etc.

References:-

1. A Practical English Grammar, Business Correspondence and Report Writing - By R. Sharma; TMH.
2. Living English Structure – By W.S. Allen; Longmans
3. English Grammar – Ehrlich, Schaum Series; TMH.
4. Spoken English for India – By R.K. Bansal and IB Harrison Orient Longman.
5. New International Business English – by Joans and Alexander; OUP.
6. Communication Skills – Dr Neeta Sharma,
7. Effective Technical Communication – Rizvi; TMH.
8. Communication for Science & Engineering, by Dr Binod Mishra.
9. Business Communication by Dr R.C. Sharma.

Suggested List of Experiment:

The language lab focuses on the production and practice of sounds of English through audio – visual aids and computer software. It intends to enable the students to speak English correctly with confidence and intends to help them to overcome their inhibitions and self – consciousness while speaking in English.

Lab Sessions with the help of Language lab software: Tense Buster and Study Skills Success

Topic to be covered in the Language Laboratory Sessions;

- Self Introduction (Self, Brief, Detail)
- JAM Session
- Extempore
- Role Play
- Story with a Twist
- Picture Description
- Debate
- Group Discussion
- Oral Presentation
- Telephonic Etiquettes
- Movies & Videos (Based on Learning English, With Hindi & English Subtitle)



Subject Code: - EEE160

Subject Name: - Basic Electrical Engineering

Semester: I

L	T	P	C
2	1	2	4

Course Objectives:

- To provide strong foundation in basic science and mathematics necessary to formulate, solve and analyze electrical and electronics problems.
- Understand the basic concepts of magnetic circuits, AC & DC circuits.
- Explain the working principle, construction, applications of Transformers.
- Understand the basic concepts of generating stations.

Unit-I

1- Phase AC Circuits: Generation of sinusoidal AC voltage, definition of average value, R.M.S. value, form factor and peak factor of AC quantity, concept of phasor, concept of power factor, concept of impedance and admittance, active, reactive and apparent power, analysis of R-L, R-C, R-L-C series & parallel circuit.

Unit-II

3-Phase AC Circuits: Necessity and advantages of three phase systems, the meaning of phase sequence, balanced and unbalanced supply and loads. The relationship between line and phase values for the balanced star and delta connections. Power in balanced & unbalanced three-phase system and their measurements.

Unit-III

Magnetic Circuits: Basic definitions, magnetization characteristics of ferro magnetic materials, self inductance and mutual inductance, energy in linear magnetic systems, coils connected in series, AC excitation in magnetic circuits, magnetic field produced by current carrying conductor, force on a current carrying conductor. Induced voltage, laws of electromagnetic induction, direction of induced e.m.f. single phase transformer: general construction, working principle, e.m.f. equation, open circuit and short circuit test.

Unit-IV

Transformer: Construction of transformer, working principle, e.m.f. equation, equivalent circuit, losses, separation of hysteresis and eddy current losses, efficiency, different types of winding connections, power and distribution transformer, autotransformer: working, advantages.

Unit-V

Electrical Energy Generation: Concepts, various types of generating stations and their locations. Study of thermal, hydel, nuclear and non conventional energy generation schemes, difference between conventional and non-conventional sources of energy.

Course Outcomes:

After successfully studying this course, students will:

- Acquire skills using single and three phase electrical AC circuits.
- Acquire skills of magnetic circuits and transformer.
- Acquire skills of basics of power generation techniques.

References:-

1. D.P. Kothari & I.J. Nagrath, Basic Electrical Engineering, Tata McGraw Hill, latest edition.
2. S.N. Singh , Basic Electrical Engineering, P.H.I.,2013
3. Rajendra Prasad, Fundamentals of Electrical Engineering, Prentice Hall,2014
4. M.S. Sukhija, T. K. Nagsarkar, Basic Electrical and Electronics Engineering, Oxford University press,2012
5. C.L. Wadhwa, Basic Electrical Engineering, New Age International.
6. Bharti Dwivedi, Fundamentals of Electrical Engineering, Wilkey India, 2013
7. Sanjeev Sharma, Basic Electrical Engineering, I.K. International
8. Power Generation Technology-Dr. V. K. Sethi, Sudit Publication

Suggested List of Experiment:-

1. The study of R-L-C series circuit and draw its phasor diagram.
2. Perform an experiment to measure active and reactive power consumed by single phase inductive load while connected to single phase AC supply.
3. Performing experiment to measure line voltage, line current, phase voltage, phase current and total power consumed by the balanced 3- phase resistive load.
4. To verify the relationship in star and delta connected three-phase AC system.
5. Study of B-H curve of a magnetic core.
6. To perform open circuit and short circuit test on 1-phase transformer and determine equivalent circuit parameters.
7. Study the hydro power station.
8. Study the thermal power station.
9. To study the nuclear power station
10. Study & draw different types of electrical symbols.



Subject Code: - CSE070

Subject Name: - Foundation of Computer Science and Programming

Semester: I

L	T	P	C
2	1	2	4

Course Objectives:

- The course is designed to provide programming fundamentals using C and C++.
- To understand the concepts of programming languages and acquire art of computer programming.
- Students will learn to write programs (using structured and object oriented programming approach) in C /C++ to solve problems.

Unit-I

Introduction: Computational procedures, computer architecture, binary system, representing integers, representing floating points numbers, representing characters, string, introduction to algorithms, complexities and flowchart, high level and low level languages, introduction to C language, structure of C program.

Unit-II

Data types, Operators and Functions: Identifiers, data types, constants, declaration, assignment & print statements, data types, operators and expressions. Arithmetic operations, type conversions and cast, branching and loops, two way selection (if, if-else, nested if-else, cascaded if-else), switch statement, ternary operator? GOTO, loops (for, while-do, do-while) in C, break and continue, programming examples.

Functions, functions and program structure, function prototype, function definition, benefit of function, calling a function, argument passing – call by value call by reference, recursion. Scope rules, local and global variable, file and I/O operations.

Unit-III

Array, Pointer Structure and I/O: Introduction to arrays, initialization of array, multi dimensional arrays, passing arrays to functions, **Pointers:** Declarations, passing pointers to a function, operations on pointers, pointer arithmetic, pointers and arrays, arrays of pointers function pointers.

Structures: defining and processing, passing to a function, unions, typedef, array of structure, and pointer to structure

Unit –IV

Introduction to OOP, Classes and objects: Characteristics and concepts of OOP, procedure oriented programming Vs object oriented programming. Introduction to C++: character set, tokens, program structure, sequential and conditional execution in C++, different loops (for, do ..while, while).

Object oriented programming paradigm: Basic concepts of OOP, benefits of OOP, introduction of classes, inline member functions, objects, static data member and static member functions, constructors, parameterized constructors, default argument constructors, copy constructors, destructors, friend functions.

Unit-V

Inheritance and Polymorphism : Introduction to inheritance, access control in derived classes, advance operation with inheritance, introduction to polymorphism, examples of polymorphism, object oriented static and dynamic polymorphism, operator and method overloading, inherited methods, redefined methods, the protected interface, abstract methods and classes, public and protected properties, private operations, disinheritance, multiple inheritance. Various object oriented programming languages.

Course Outcomes:

At the end of the course the Students will be able to:

- Explain the processes by which a C programme is compiled
- Write basic C programs with variables, arithmetic operators, array, function, structure etc.
- Implement object oriented programming concepts.

Text Book:

1. Let us C : Yashavant P. kanetkar, BPB Publications.
2. Object oriented programming in C++ : Robert lafore, Galgotia publications
3. Fundamentals of computers : E Balagurusamy, Tata McGraw Hill

References:

1. Basic computer engineering : Silakari & Rajesh K Shukla, Wiley India
2. The C programming language : Brian W. Kernighan and Dennis M. ritchie, PHI
3. Object oriented programming with C++: David parsons, BPB publication
4. Programming in ANSI C : E Balagurusamy, Tata McGraw Hill

Suggested List of Experiment

1. Write a program in C to evaluate area of triangle.
2. Exchange the values of two variables with and without temporary variable.
3. Write a program to find the greatest of three numbers and print the numbers in ascending order.
4. Write a program in C to find out roots of given quadratic equations.
5. Write C code to compute the real roots of the equation: $ax^2+bx+c=0$.
6. Write a program that counts from one to ten, prints the values on a separate line for each, and includes a message of your choice when the count is 3 and a different message when the count is 7.
7. Write a program that writes your name on the monitor ten times. Write this program three times, once with each looping method.
8. Write a program to find a factorial of given n number using do while statement.
9. Write a program to print a pyramid using for loop.
10. Write a Program for Palindrome.
11. Write a program to print Fibonacci series using recursion.
12. Write a program with three short strings, about 6 characters each, and use "strcpy" to copy "one", "two", and "three" into them. Concatenate the three strings into one string and print the result out 10 times.
13. Write a program that will prompt for a filename for a read file, prompt for a filename for a write file, and open both plus a file to the printer. Enter a loop that will read a character, and output it to the file, the printer, and the monitor. Stop at EOF.

14. Define a named structure containing a string field for a name, an integer for feet, and another for arms. Use the new type to define an array of about 6 items. Fill the fields with data and print them out as follows. A human being has 2 legs and 2 arms. A dog has 4 legs and 0 arms. A Television set has 4 legs and 0 arms. A chair has 4 legs and 2 arms. etc.
15. Write a program to show different type of constructors
16. Write a program to access private member using friend function
17. Write a Program to implement multiple inheritance
18. Program to Show the concept of virtual function
19. Program in C++ to concat two string using operator overloading
20. A bookshop uses a personal computer to maintain the inventory of books that are being sold at the shop. The list includes details such as author, title, isbn number, price, author, stock position. Whenever a customer wants a book, the shopkeeper inputs the title or isbn number and the system replies whether the book is available or not. If it is not, an appropriate message is displayed. If book is in the list, then the system displays the book details and asks for number of copies. If the requested copies are available, the total cost of the books is displayed; otherwise the message “Requested copies are not in stock” is displayed. Implement using structures.

Students have to make a small project in C++.

Note: Number of experiments may be extended to make the better understanding of the subject.



Subject Code: - MEC040

Subject Name: - Designing with Computers (Using Auto CAD)

Semester: I

L	T	P	C
2	-	4	4

Course Objectives:

The objective of this course is to teach students the basic commands and tools necessary for professional 2D drawing, design and drafting using Auto CAD. In industry, the manual drafting has been replaced by the computer aided drafting. Cumbersome and laborious manual drawing work which requires costly printing / drawing instruments has now become quite easy and interesting computer aided drawings / drafting. In view of new era, there is an urgent need for development of such course. This curriculum is developed with a view to produce the workforce to meet the present and future demand of industry by covering computer aided drafting / drawing pertaining to the industrial field keeping in view the requirements of market demand by more focusing on practical and necessarily required theoretical knowledge.

Unit-I

Introduction to CAD, design process, importance and necessity of CAD, applications of CAD, hardware and software requirement of CAD, basics of geometric and solid modeling, coordinate systems. Transformations: introduction, transformation of points and line, 2-D rotation, reflection, scaling and combined transformation, homogeneous coordinates, 3-D scaling, shearing, rotation, reflection and translation.

Unit-II

Auto CAD, Auto CAD dialog boxes, coordinate systems, drawing lines and working with layers, Circle, Arcs, Rectangle, Ellipse, Polygons, Pline, Splines, Grid, Snap, Ortho, Isometric plane etc. Editing commands like: move, copy, paste, offset, scale, chamfer, trim, mirror, fillet, rotate, break, extend, arrays, OSNAP, exercises dimensioning Auto CAD, creating linear, rotated, angularly aligned base line dimensions, modifying dimensions, text style and table.

Unit-III

Basic geometrical constructions, curves used in engineering practices conics– construction of ellipse, parabola and hyperbola by eccentricity method– construction of cycloid– construction of involutes of square and circle– drawing of tangents and normal to the above curves in Auto CAD.

Unit-IV

Projection of straight lines (only First angle projections) inclined to both the principal planes through Auto CAD. Projection of planes (polygonal and circular surfaces) inclined to both the principal planes by rotating object method.

Unit-V

Orthographic projection- principles-Principal planes-First angle projection. Introduction to Auto CAD 3-D modeling. Projection of simple solids like prisms, pyramids, cylinder, cone, a method of print out.

Note: Drawings should be made in Auto CAD for respective topics for practical submissions.

Course Outcomes:

Draw various types of drawing, draw any 2D view of the object, draw 3D view of the object be able to render all type of drawings, be able to draw detail drawing, be able to prepare various application drawings for Industrial applications, be able to prepare various worksheets.

Demonstrate basic concepts of the AutoCAD software, apply basic concepts to develop construction (drawing) techniques, ability to manipulate drawings through editing and plotting techniques, understand geometric construction, Produce template drawings, produce 2D Orthographic Projections, understand and demonstrate dimensioning concepts and techniques, Design Center, and Tool Palettes, become familiar with Solid Modeling concepts and techniques.

References:-

1. Engineering Graphics with Auto CAD by Agrawal & Agrawal
2. Auto CAD for Engineers and Designers, Sham Tickoo, Dream Tech Press
3. Machine Design by R.S. Khurmi, S Chand Publishares