



## **BS1101 ENGINEERING MATHEMATICS - I**

Teaching Scheme:

Lectures: 3 Hrs/Week

Tutorial: 1 Hr/Week

Credits: 4

Examination Scheme:

In-Semester : 50 Marks

End-Semester: 50 Marks

### **Course Objectives:**

Mathematics is a necessary path to scientific knowledge which opens new perspective of mental activity. Our aim is to provide sound knowledge of engineering mathematics to make the students think mathematically and strengthen their thinking power to analyze and solve engineering problems in their respective areas.

### **Course Outcomes:**

1. Solve the system of Linear equations by using the matrix method and apply it to check Linear Dependence, Independence of the vectors.
2. Calculate eigen values, eigen vectors and apply it to diagonalize a matrix.
3. Analyze roots of algebraic equations by applying De Moivre's theorem and analyze the function of complex numbers .
4. Compute power series expansions by using higher order derivatives.
5. Calculate partial derivatives and use to analyze maxima, minima of a given function.

### **Unit – I: Matrices**

**(07)**

Matrices, Rank of the matrix, Echelon Form, Normal form, Inverse of the matrix, System of Linear Equations, Linear Dependence and Independence, Linear Transformations, Rotation and Translation Matrices.



**Unit – II: Applications of matrices (06)**

Eigen Values, Eigen Vectors , Cayley Hamilton Theorem , Diagonalization and applications in finding powers of matrix.

**Unit–III: Complex numbers and its applications (08)**

Argand diagrams, De moivre's theorem and its applications, Hyperbolic Functions, Separation of real and imaginary parts of functions of complex numbers, Inverse Hyperbolic Functions, Logarithm of Complex Numbers.

**Unit – IV: Differential calculus (05)**

Successive Differentiation, Method of finding nth order derivative of functions, Leibnitz theorem, Taylor's series, Maclaurin's Series.

**Unit – V: Partial Differentiation (07)**

Partial Differentiation, chain rule, composite functions, Euler's theorem on homogeneous functions, Total derivatives .

**Unit – VI: Jacobian and its applications (08)**

Jacobian, Chain rule, Partial derivatives using Jacobian, Errors and Approximations, Maxima and Minima of functions of two variables, Lagrange's method of undetermined multipliers.

**Text Books:**

1. B.S. Grewal, '**Higher engineering Mathematics**', *Khanna publishers, Delhi*(40<sup>th</sup> edition),(2008).
2. B. V. Ramana, '**Higher Engineering Mathematics** ', *Tata McGraw Hill Publications* (2007)
3. Erwin Kreyszig , '**Advanced Engineering Mathematics**' *Wiley Eastern Ltd.*(8th Student Edition)(2004).

**Reference Books:**

1. C.R.Wylie, L.C. Barrette, '**Advanced Engineering Mathematics**', *McGraw Hill Publications, New Delhi.*(6<sup>th</sup> edition)(2003)
2. Peter V. O'neil, '**Advanced Engineering Mathematics**' , *Thomson Brooks / Cole, Singapore* (5th edition ) (2007).



## BS1102 PHYSICS – I

### Teaching Scheme

Lectures: 2 Hrs per week

Tutorial: 1 Hr per week

Credits: 3

### Examination Scheme:

In-Semester : 25 Marks

End-Semester: 50 Marks

### Course Objective:

1. To introduce undergraduate students Of engineering to the principles, notions, basic physical ideas, mathematical relations and applications of Classical Physics, specifically pertaining to the theories of Electromagnetic Radiation, Optics, Special Relativity
2. To point out some of the contexts in which Classical Physics fails to account for certain experimental observation thereby requiring Quantum Physics to take over

### Course Outcomes:

By taking this course, the learner will be able to –

- 1: **Use** the laws of Electrostatics and Electromagnetic Radiation to determine the electric field due to static and dynamic charge distributions.
- 2: **Apply** the laws of physical optics in situations involving interference, diffraction and polarization patterns.
- 3: **Justify** the use of the principles of special relativity in situations involving elementary particles.
- 4: **Judge** the relevance of quantum mechanical principles and methods in finding out interferometric behavior and allowed energy states of particles with arbitrary spins.

### Unit – I: Electromagnetic Radiation and Interference: (4)

Expression for the electric field beyond Coulomb's law; The dipole radiator; Physics of interference – Two dipole radiator

### Unit – II: Diffraction and Polarization: (4)

The resultant amplitude due to  $n$  equal oscillators; Diffraction Grating; The electric vector of light; Birefringence; Polarisers



**Unit – III: Capacitance and Dielectrics:** (4)

Electrostatic energy; Capacitance of a Parallel-Plate Capacitor; The dielectric constant; The polarization vector

**Unit – IV: Special Relativity:** (4)

The Lorentz transformation; Slowing of clocks; Contraction of length; Relativistic energy

**Unit – V: Quantum Behaviour – I: Particles and Waves:** (4)

Experiments with bullets, waves and electrons; The uncertainty principle

**Unit – VI: Quantum Behaviour – I: The Magnetism of Matter:** (4)

The Precession of atomic magnets; Angular momentum in Quantum Mechanics; The magnetic energy of atoms; Quantized magnetic states

**Text Book:**

R. P. Feynman, R. B. Leighton and M. Sands, **‘The Feynman Lectures on Physics’**, *Pearson Education* (2006)

**Reference Books:**

1. J. Walker, D. Halliday, R. Resnick, **‘Principles of Physics’**, *Wiley Student Edition* (10<sup>th</sup> Edition)
2. H. Young and Roger Freedman, **‘University Physics’**, *Pearson Addison Wesley* (12<sup>th</sup> Edition)



## BS1103 CHEMISTRY- I

### Teaching Scheme:

Lectures: 2 Hrs/Week

Tutorial: 1 Hr/Week

Credits: 3

### Examination Scheme:

In-Semester: 25 Marks

End-Semester: 50 Marks

### Course Objectives:

The Chemistry course is designed such that the learners develop a sound background of fundamental concepts and principles relevant in the engineering context. The course facilitates undergraduates to learn bonding theories, methods of analysis and evaluate role of chemical substances. They analyze chemical processes related to engineering applications. Also the course inculcates basic problem solving skills involving chemistry principles.

### Course Outcomes:

1. State laws, formulae, definitions and properties.
2. Interpret the types of chemical bonding in molecules and comprehend various principles of analytical methods.
3. Apply principles of fundamental chemistry to solve problems.
4. Analyze chemical processes for engineering applications based on chemical reactions.
5. Critique the role of a chemical substance for particular function.

### Unit – I: Chemical Bonding

(05)

Types of bonds - primary & secondary types with examples, hybridization based on valence bond theory, VSEPR theory, molecular orbital theory with respect to bonding in homo and hetero nuclear diatomic molecules.



## **Unit – II: Water Analysis and purification**

**(06)**

Chemical Analysis of water hardness, alkalinity and effect of hard water in boilers, Internal treatment of boiler feed water, water softening techniques (Permutit and Ion exchange method) and membrane based processes.

## **Unit – III: Electro chemistry**

**(06)**

(a) Fundamentals of an electrochemical cell, EMF of cell, reference and indicator electrodes, conductance in solution and conductometric titration.

(b) Battery Technology

Primary & secondary cell, battery characteristics, Ni-Cd cell, Lithium-ion battery, rechargeable batteries, Fuel cell technology.

## **Unit – IV: Instrumental methods of Analysis-I**

**(04)**

Basic principles, instrumentation and applications of pHmetry, Potentiometry, Chromatography

## **Unit – V: Coordination Chemistry**

**(05)**

Introduction, Classification of ligands, naming coordination compounds, Werner and Sidgwick theory, VBT, CFT for Td and Oh complexes. Applications and comparison of VBT & CFT.

## **Unit – VI: Photochemistry**

**(04)**

Photochemical reactions, Laws of Photochemistry and quantum yield, energy transfer in photochemical reaction, applications.

### **Text Books:**

1. Arun Bahl & G.D. Tuli, **Essentials of Physical Chemistry**, S.Chand Publications (2014)
2. S.S. Dara '**Engineering Chemistry**' S. Chand Publications (2010)
3. Puri, Sharma, Kalia '**Principles of Inorganic Chemistry**': Milestone Publications (2009)
4. B.S. Chauhan '**Engineering Chemistry**' :Univ Sc Press.(third edition)2009



5. Shashi Chawla '**A Text Book Of Engineering Chemistry**': *Dhanpat Rai & Co.*(2015)
6. Jain and Jain '**A Text Book Of Engineering Chemistry**' *Dhanpat Rai & Co.*
7. Gurdeep Chatwal '**Instrumental methods of Chemical Analysis**' *Himalaya publ.house*

**Reference Books:**

1. Steven S. Zumdahl, '**Chemistry concepts and applications**', *Cengage learning publication* (2009)
2. Ram D. Gupta, '**Hydrogen fuel**' *C.R.C.Publications*(2009)
3. Puri, Sharma, Pathania '**Principles of Physical Chemistry**' : *Vishal Publ. Co.*(2015)
4. Robert D. Braun' **Instrumental methods of analysis**' *Pharmamed press* (2010)



## ES1101 Basic Electrical and Electronics Engineering - I

### Teaching Scheme:

Lectures: 3 Hrs/Week

Credits: 3

Marks

### Examination Scheme:

In-Semester: 25 Marks

End-Semester: 50

### Course Objectives:

1. To make students familiar with the fundamental concepts of electric and magnetic circuits.
2. To educate the students about the realization of basic theoretical concepts & laws in real physical world.
3. To educate the students about the construction and applications of diode
4. To educate the students about the construction and applications of BJT

### Course Outcomes:

After completion of course, students will be able to

- 1) Determine energy consumption for electro-thermal and electro-mechanical systems as well as analyze the temperature effect on resistance
- 2) Analyze given magnetic circuit and find circuit parameters
- 3) Analyze given DC circuit and calculate its parameters
- 4) Calculate average value and RMS value of sinusoidal and non-sinusoidal AC waveforms.
- 5) Analyze I-V characteristics of semiconductor diodes and transistors and design simple analog circuits using these devices

### Unit – I: Introduction to electrical systems

(05)

Review of basic electrical terms, Effect of temperature on resistance, Resistance temperature coefficient, insulation resistance, Work, Power and energy calculations for thermal, mechanical and electrical systems.

### Unit – II: DC Networks

(07)

Kirchoff's laws, Mesh and Nodal Analysis, Thevenin , Norton and Superposition Theorems, maximum power transfer theorem, Network Simplifications using star-delta / delta-star transformations.



### **Unit – III: Electromagnetism and Magnetic Circuits**

**(06)**

Magnetic field due to electric current, Force on a current carrying conductor, Electromagnetic induction, direction and magnitude of induced EMF, magnetomotive force and magnetic field strength, relative and absolute permeability, reluctance, series and parallel magnetic circuits, magnetic materials and B-H curve, self and mutual inductance, coupling coefficient, energy stored in magnetic circuits.

### **Unit – IV: Electrostatics and AC fundamentals**

**(06)**

- A.** Electrostatic field, electric flux density, electric field strength, permittivity. Capacitor and capacitance, dielectric strength and breakdown voltage, capacitors in series and parallel, composite capacitors, energy stored in capacitors, charging and discharging of capacitors and time constant
- B.** Generation of alternating emf, waveform terms and definitions, average value and rms values for sinusoidal and non sinusoidal currents and voltages, phasor representation of an alternating quantity

### **Unit – V: Diodes and rectifiers**

**(06)**

Overview of Semiconductor physics and p-n junction theory, Junction diode, construction and characteristic of p-n junction diode, zener diode, LED, photodiode, Half wave, full wave and bridge rectifiers, need of capacitor filter, rectifier operation with capacitor filter, zener diode as a voltage regulator, block diagram of Regulated power supply

### **Unit – VI: Junction Transistor Amplifiers**

**(06)**

Bipolar junction transistor, Construction of BJT, Types of biasing: -fixed bias and self bias circuit, BJT characteristics for-CE,CB,CC configurations, relationship between  $\alpha$  and  $\beta$ , load line for a transistor, application of transistor as a switch and amplifier.

#### **Text Books:**

1. Hughes, '**Electrical and Electronic Technology**', *pearson education*, (9<sup>th</sup> edition), (2009)

#### **Reference Books:**

1. D. P. Kothari and I.J. Nagrath, '**Basic Electrical Engineering**', *McGraw-Hill*, (3<sup>rd</sup> edition), (2010)



2. A. E. Fitzgerald, A.Grabiel, '**Basic Electrical engineering**', *McGraw-Hill*, (5<sup>th</sup> edition), (2009)
3. Floyd, '**Electronic Devices and Circuits**', *pearson education*, (7<sup>th</sup> edition),(2008)



## ES 1102 Fundamentals of Programming Language - I

### Teaching Scheme:

Lectures: 1 Hr/Week

Credits: 1

### Examination Scheme:

In-Semester: 25 Marks

### Course Objectives:

1. Learn the fundamentals of building blocks of computer.
2. Understand how to formulate the programming language statements from description of a problem in English.
3. Understanding of decision and iteration interpretation in a programming language.
4. Understand basic building blocks of simple website.

### Course Outcomes:

1. Students will understand the building blocks of computer.
2. Students will know the syntax of C language.
3. Students will be able to convert a simple problem description to logical steps.
4. Students will be able to convert a mathematics problem in Programming code.
5. Students will be able to convert logical steps into a Programming code.
6. Students will be able to design a website using CMS.

### Unit – I: Introduction to Programming

(02)

Introduction to computer, Anatomy of a computer: Hardware and software, Operating system, Types of programming languages: Machine language, Assembly language, High level languages, Selection of language, Algorithm: As a program, As a flow-chart, Pseudo code



**Unit – II: Writing First C Program (02)**

Structure of a C program, Writing C program, Introduction to library functions in C, Files generated in C program, Comments, Indentation

**Unit – III: Variables and Operations (03)**

C language variables: Numeric, Character, Declaring and Initializing variables, Constants: Integer, Floating point, Character, String, Operators: Arithmetic, Relational, Equality, Logical, Unary, Conditional, Bitwise, Assignment, Comma, Sizeof, Operator precedence, variable scope: Local and Global scope, Type casting and conversion

**Unit – IV: Control flow in C Language (03)**

Conditional branching statements: if statements, if-else Statement, Switch case, Iterative statements: while loop, do-while loop, for loop, Nested loops, break and continue statements

**Unit – V: Arrays (02)**

Introduction to Arrays, Accessing Array elements, Internal representation of Arrays in C, Working with one-dimensional array, Introduction to two-dimensional arrays

**Unit – VI: Introduction to Website Development (02)**

Introduction to blogging and Word Press : Creating a simple website, Content creation, Pages and Blogs, Page linking, Comments, Adding contents like Multimedia, Presentations, Themes

**Text Books:**

1. ReemaThareja, '**Introduction to C programming**', *Oxford University Press* (2<sup>nd</sup> edition), (2015)
2. Pradeep Day, '**Computer Fundamentals and programming in C**', *Oxford University Press*, (2nd edition) (2013)



**Reference Books:**

1. B Kernighan, D Ritchie, '**C programming Language**', *Prentice Hall Software Series*, (2nd edition) (1988)



## ES1103 Basic Mechanical Engineering

### Teaching Scheme:

Lectures: 3Hrs/Week

Credits: 3  
Marks

### Examination Scheme:

In-Semester: 25 Marks

End-Semester: 50

### Course Objectives:

1. To provide an overview of mechanical engineering systems (Power plant, Manufacturing plant, Maintenance systems, transmission systems).
2. To enable students to understand terminology used in Mechanical engineering with its significance.
3. To make student understand concept of Mechatronics System.

### Course Outcomes:

1. The student will be able to differentiate between major areas like Design, Manufacturing and Thermal in mechanical industries while addressing a problem.
2. The student will be able to select an appropriate sector while finding solution to a problem.
3. The student will be aware of avenues available while choosing career opportunities in mechanical engineering Industry.
4. Understand the underlying principle of energy conversion systems and power plants, power producing and Power absorbing devices.
5. Students will be able to identify Mechatronics System and its components.

### Unit – I: Introduction to basic mechanical engineering

(06)

Industry overview-Comparison between process, product and service industry. Work environment



for Mechanical industries, role of a mechanical engineer, ethics, professional hazards and safety concerns in mechanical industry. Typical manufacturing method of a product.

**Unit – II: Introduction to thermal engineering (08)**

Thermodynamic system, properties, states, process, cycle, first law of thermodynamics, application of first law to open and closed systems, second law of thermodynamics, conceptual difference between heat engine, heat pump and refrigerator, significance of efficiency and coefficient of performance. Numerical on appropriate topics.

**Unit – III: Power producing devices and power absorbing devices (08)**

Power producing devices-Internal combustion engines and turbines, power plants.

Power absorbing devices-Centrifugal pumps, reciprocating units, vapour compression refrigeration, air conditioning systems.

Energy management system-fluctuations in demand-supply of energy, need of power grid, concept of energy audit.

**Unit – IV: Introduction to design engineering**

Introduction to engineering materials, elements and principles of engineering design, basic procedure, Basic requirement, standards in design, aesthetic and ergonomic considerations in design.

Basic machine elements, shaft, key, coupling, bearing, clutch and brake.

Mechanical drives, belt, chain and gear.

**Unit – V: Introduction to manufacturing (08)**

Operation on different machine tools, lathe, Milling, Drilling.

Joining of metals, welding-gas and arc, TIG, MIG, Soldering, brazing. Hot and cold working-Forging, rolling, extrusion.

**Unit – VI: Introduction to Mechatronics (06)**

Definition(S) of Mechatronics, Mechatronics system Components, Levels of Mechatronics



system, Examples of Mechatronics (products and systems in manufacturing), Advantages of Mechatronics with Traditional Systems.

#### **Text Books:**

1. C.P. Aurora, '**Thermodynamics**', *Tata McGraw Hill education*, (2001).
2. Basant Agarwal, C.M Agarwal, '**Basic Mechanical Engineering**', *Wiley Ind. Pvt. Ltd.*
3. V B Bhandari, '**Design of Machine Elements**', *Tata McGraw Hill*, (2nd edition), (2007).
4. S. K.HajraChoudhury, S.K.Bose, A.K.HajraChoudhury, '**Elements of workshop technology, volume I and II**', *Media promoters and publishers pvt. Ltd*(7<sup>th</sup> edition).
5. W.Bolton, '**Mechatronic-a multidisciplinary approach**', *Prentice Hall*, (4<sup>th</sup> edition), (2009).
6. Class room notes.

#### **Reference Books:**

1. Moran, Shapiro, Boettner, Bailey, '**Principles of engineering thermodynamics**', *Wiley*, (7<sup>th</sup> edition).
2. Rayner Joel, '**Basic engineering thermodynamics**', *Addison-Wesley*, (5<sup>th</sup> edition).
3. Y. A. Cengel and M. A. Boles, '**Thermodynamics, an Engineering Approach**', (4th edition).
4. S.S. Rattan, '**Theory of Machine**', *McGraw Hill*, (4<sup>th</sup> edition).
5. B.S. Raghuvanshi, '**A course in workshop technology**', *DhanpatRai&co.*
6. Kalpakjian, Schmid, '**Manufacturing engineering and technology**', *Pearson*, (4<sup>th</sup> edition).
7. Nptel course112105127/1, 112105127/2



## ES 1104 Engineering Mechanics

### Teaching Scheme:

Lectures: 2Hrs/Week

Tutorial: 1Hr/Week

Credits: 3

### Examination Scheme:

In-Semester: 25 Marks

End-Semester: 50 Marks

### Course Objectives:

1. To develop the ability of students to analyze any problem in a simple and logical manner.
2. To make the students understand the fundamental principles of mechanics which are the foundation of much of today's engineering.
3. To develop logical thinking of the students for application in engineering.
4. To provide an introduction to the basic quantities of mechanics.

### Course Outcomes:

A student should be able to obtain/develop:

1. An ability to apply knowledge of mathematics, science and engineering
2. A recognition of the need for, and an ability to engage in, life-long learning.
3. Application of Newton's laws of motion
4. Knowledge of kinematic & kinetic analysis.

### Unit – I: Introduction to Statics

(06)

- a) Fundamental concepts and principle (The parallelogram law of addition of forces, the principle of transmissibility, Newton's laws of motion, Newton's law of gravitation). Introduction to a force in a plane, Types of force system, resolution & composition of



forces, Methods of composition to find resultant, moment of force, Varignon's theorem, couple, equivalent force couple system.

b) Introduction to force in a space, problems on resultant of concurrent force system

c) Equilibrium- Introduction to concept of equilibrium, Conditions of equilibrium, Free body diagram, equilibrium under different forces, equilibrium of concurrent parallel & general forces in a plane.

**Unit – II: Introduction to type of Supports and Beam (05)**

a) Types of supports (Fixed, roller, hinged support)

Types of loads on a beam (point load, uniformly distributed load, uniformly varying load) Types of beams (simple beam, cantilever beam, compound beam)

b) Problems on Reactions & analysis of beams

c) Centroid- Definitions (Center of gravity of two dimensional body, center of mass, centroid), procedure to find centroid of regular plane lamina.

**Unit – III: Introduction to Friction (03)**

Definition and classification of friction, coefficient of static and kinetic friction, angle of friction, angle of repose, problems on block friction and ladder friction

**Unit – IV: Rectilinear Motion (05)**

a) Variables in Rectilinear motion- Time, Position, Displacement, Distance travelled, Velocity, Acceleration

Equations of motion for constant acceleration & motion under gravity, variable acceleration, relative motion based on kinematic equations.

b) Application of Newton's second law of motion for rectangular co-ordinate system (D' Alembert's principle)



### Unit – V: Curvilinear Motion

(05)

- a) Equation of motion in rectangular components, Normal & Tangential components, Radial & Transverse components.
- b) Projectile motion- Definition and derivation (time of flight, horizontal range, angle of projection, maximum height, trajectory), Projectile on horizontal plane only

### Unit – VI: Work Energy Principle

(04)

- a) Introduction and definition of Work, power, energy, conservative & non- conservative forces, Conservation of energy, work-energy principle.
- b) Problems on Work done by different forces (External force, Frictional force, Gravitational force, Spring force).

#### Text books:

- 1) A Nelson, '**Engineering Mechanics Statics and Dynamics**', *Mc Graw Hill Education*.
- 2) R.S. Khurmi, '**A Textbook of Engineering Mechanics**', *S. Chand & Company Ltd.*

#### Reference books:

- 1) Beer & Johnson, '**Vector mechanics for engineers**', *Mc Graw hill publication*.
- 2) I. H. Shames & G.K.M. Rao, '**Engg. Mechanics**', *Pearson*.
- 3) R. C. Hibbler, '**Engg. Mechanics statics & dynamics**', *Pearson publication*
- 4) S. Timosenko, DPT.young & J.V.Rao, '**Engineering mechanics**', *Tata Mc Graw hill education pvt. Ltd. New delhi*.



## BS1104 Physics and Chemistry Lab – I

### Teaching Scheme

Practical: 2 Hrs/Week

Credits: 1

### Examination Scheme

In-Semester: 25

- 1: Record** the observations as per the least counts of measuring instruments and carry out plotting and necessary calculations pertaining to the optical, electromagnetic and thermal systems.
- 2: Analyze** the plotted data and experimental findings with the corresponding theoretical physical models pertaining to the optical, electromagnetic and thermal systems.
- 3: Analyze** the sources of errors and arrive at conclusions pertaining to the behavior of optical, electromagnetic and thermal systems
- 4: Determine** quality parameters of water such as hardness, alkalinity etc
- 5: Use** of instrumental techniques in quantitative estimations like conductometry, pH metry, potentiometry.
- 6: Select** appropriate quantitative analysis for estimation of different parameters of the substance.
- 7: Interpret** the significance of a technique and specific role of reagent in qualitative and quantitative analysis.

### List of Experiments:

#### Physics

1. Michelson Interferometer
2. Specific heat of substance
3. Hall Effect
4. Balmer Series and Emission Spectra
5. Zeeman Effect (Demo)

#### Chemistry

1. Qualitative & quantitative Analysis of alkali /alkaline earth metals using Flame Photometry.
2. Colorimetric verification of Beer-Lambert's law.
3. Determination of molecular weight of polymer using Ostwald Viscometer.
4. Proximate analysis of coal.



## ES 1105 Basic Electrical and Electronics Engineering Lab-I

### Teaching Scheme:

Practical: 2 Hrs./Week

Credits: 1

### Examination Scheme:

Practical Exam: 25 marks

### Course Outcomes:

After completion of course, students will be able to

1. Perform basic domestic wiring
2. Apply circuit laws to find the parameters of given electrical network
3. Build a basic regulated DC power supply
4. Analyse the performance of Transistor in CE configuration
5. Write technical report of conducted experiment

### List of experiments:

1. Study of different electrical and electronics components and instruments.
2. To perform electrical wiring to control lamps using one way and two-way switches.
3. Determination of Temperature Rise of a Medium Resistance
4. Verification of kirchoff's laws & superposition theorems
5. Verification of Thevenin's theorem.
6. Performance analysis of half wave,full wave rectifier with center tap transformer and bridge rectifier with and without filter.
7. Performance analysis of three terminal IC voltage regulator
8. Determination of frequency response of CE amplifier.



## ES 1106 Fundamentals of Programming Language Lab- I

### Teaching Scheme:

Practical: 2 Hrs/Week

Credits: 1

### Examination Scheme:

Practical: 25 Marks

### Section – I: Understanding of IDE (02)

Learning of basic commands of Linux OS and Understanding of IDE to execute a C program.

### Section – II: Simple C Assignments (16)

Assignments in C to make student learn and understand accepting of data, displaying the data with different ways of formatting, various operators, conditional statements, looping structure, control flow and basics of array.

### Section – III: Word Problems (06)

Assignments based on word problems to make the student read, analyze and understand the solution to a given problem to implement in C Language.

### Section – IV: Mini Project (04)

Mini project type assignment to develop a Website.



## ES1107 Engineering Mechanics Lab

### Teaching Scheme:

Lectures: 2 Hrs/Week

Tutorial: 1 Hr/Week

Credits: 1

### Examination Scheme:

In-Semester: 25 Marks

End-Semester: 50 Marks

No. of Experiments:

#### Part A-Experiments (any 7 experiments)

1. Verification of law of polygon of forces.
2. Verification of Varignon's theorem.
3. Verification of Lami's theorem.
4. Support reactions of simple beam.
5. To determine forces in space force system.
6. Study of Curvilinear motion.
7. Determination of coefficient of restitution.
8. To compare coefficient of friction of various pair of surfaces in contact.

#### Part B- Graphical analysis -(Any one)

- a) To find resultant of force system.
- b) To find support reactions of simple beam.