B TECH DEGREE COURSE (2018 SCHEME) - SYLLABUS FOR COMBINED I & II SEMESTER

Course No	Name of subject	Weekly load, hours			Maximum CA Marks	Exam duration	Maximum University Exam Marks	Total Marks	Credits
		L	T	D/P					
18.101	Engineering Mathematics I & II (FTR)	2	1	-	50	3	100	150	4
18.102	Engineering Physics (FTR)	2	1	-	50	3	100	150	4
18.103	Engineering Chemistry (FTR)	2	1	-	50	3	100	150	4
18.104	Engineering Graphics (FTR)	1	-	2	50	3	100	150	3
18.105	Engineering Mechanics (FTR)	2	1	-	50	3	100	150	4
18.106	Basic Civil Engineering (FTR)	2	1	-	50	3	100	150	4
18.107	Basic Mechanical Engineering (FTR)	2	1	-	50	3	100	150	4
18.108	Basic Electrical Engineering	2	1	-	50	3	100	150	4
18.109	Foundations of Computing and Programming in C (FR) Semiconductor Devices (T)	2	1	-	50	3	100	150	4
18.110	English (FTR)	2	1	-	50	3	100	150	3
18.111	Mechanical Engineering Workshop (FTR)	-	-	2	25	3	50	75	2
18.112	Electrical & Electronics Engineering Workshop (FTR)	-	-	2	25	3	50	75	2
Total					550		1100	1650	42

Branch code	
T	ELECTRONICS AND COMMUNICATION ENGINEERING
R	COMPUTER SCIENCE AND ENGINEERING
F	INFORMATION TECHNOLOGY

L	Lecture
T	Tutorial
D	Drawing
P	Practical

18.101 ENGINEERING MATHEMATICS I (FTR)

Teaching Scheme: 2(L) - 1(T) - 0(P) **Credits: 4**

Course Objective:

- *To equip the students with the basic tools in Mathematics.*
- *To provide students mathematical knowledge and skills needed to support their concurrent and subsequent Engineering studies*
- *Incorporate the knowledge of Calculus and its applicability in different Engineering Fields.*

MODULE I

Applications of differentiation: Definition of Hyperbolic functions and their derivatives-successive differentiation-Leibnitz' Theorem (without proof)-Curvature-Radius of curvature-centre of curvature - evolutes (Cartesian, polar and parametric forms) .

Partial differentiation: Partial derivatives-Euler's theorem on homogenous functions-Total derivatives-Jacobians of transformations-Maxima and Minima of functions of 2 variables - Lagrange's method.

MODULE II

Sequences and series: Convergence of Sequences and series-tests for convergence-Ratio test,Comparison test,integral test,Cauchy's root test,Raabe's test-Absolute and Conditional convergence-Power series-Taylor's series-Maclaurin's series-Fourier series-Half range Sine and cosine series.

MODULE III

Multiple Integrals: Double integrals –Properties- Evaluation of double integrals (Cartesian only) –Change of order of integration- Change of variables (Cartesian to polar)-Area enclosed by plane curves (Cartesian only) - Triple integrals-Evaluation of triple integrals in Cartesian coordinates-Volume as triple integrals.

MODULE IV

Matrices: Rank of a matrix- elementary transformations – equivalent matrices- Echelon form – LU Decomposition – System of linear equations - consistency – solution of a system linear equations – Non homogeneous and homogeneous equations – Linear dependence and independence of vectors – Eigen values and Eigen vectors –Cayley-Hamilton Theorem - Properties of Eigen Values and Eigen vectors – Diagonalisation of matrices – Quadratic forms – Reduction to Canonical Forms.

References:

1. Kreyszig, Advanced Engineering Mathematics, 9/e, Wiley India, 2013.
2. Grewal B.S., Higher Engineering Mathematics, Khanna Publications, 2012.
3. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill, 2007.
4. Bali N. P. and Manish Goyal, Engineering Mathematics, 7/e, Laxmi Publications, India, 2012.
5. Babu Ram, Engineering Mathematics, Pearson, 2012.
6. Srivastava, Engineering Mathematics, Prentice Hall, India, 2010 .

Internal Continuous Assessment (Maximum Marks-50)

50% - Tests (minimum 2)

30% - Assignments (minimum 3) such as home work, problem solving, quiz, literature survey, seminar, term-project, software exercises, etc.

20% - Regularity in the class

University Examination Pattern:

Examination duration: 3 hours

Maximum Total Marks: 100

The question paper shall consist of 2 parts.

Part A (20 marks) - Ten Short answer questions of 2 marks each. All questions are compulsory. There should be at least two question from each module and not more than three questions from any module.

Part B (80 Marks) - Candidates have to answer one full question out of the two from each module. Each question carries 20 marks.

Note: Each question may contain sub-questions a), b) etc. Descriptive questions should not exceed 40%.

Course Outcome:

After the successful completion of the course:

1. Student can write higher order derivative of standard functions
2. Student can express the power series expansion of a given function and evaluate limits
3. Student can evaluate partial derivatives and can implement to estimate maxima and minima of multivariable function
4. Student can integrate a continuous function of two or three variables region.
5. Student can use matrices in the techniques for solving system of simultaneous linear equations, find Eigen values and Eigen vectors of the matrix, and understand the definiteness of Quadratic forms.

18.102 Engineering Physics (F T R)

Teaching Scheme: 2(L) - 1(T) - 0(P) **Credits: 4**

Course Objective: *This course is designed to provide a bridge to the world of technology from the basics of science and to equip the students with skills in scientific inquiry and to improve problem solving capability.*

Module I: Oscillations and Waves

Harmonic Oscillations: Differential equation of damped harmonic oscillation, forced harmonic oscillation and their solutions- Resonance, Qfactor, Sharpness of resonance- LCR circuit as an electrical analogue of Mechanical Oscillator (Qualitative)

Waves: One dimensional wave - differential equation and solution. Three dimensional waves - Differential equation & its solution. (No derivation) Transverse vibrations of a stretched string.

Module II: Optics, LASER and Photonics

Interference: Coherence. Interference in thin films and wedge shaped films (Reflected system) Newton's rings-measurement of wavelength and refractive index of liquid Interference filters. Antireflection coating.

LASER: Properties of Lasers, absorption, spontaneous and stimulated emissions, Population inversion, Einstein's coefficients, Working principle of laser,Optial resonant cavity. Ruby Laser, Helium-Neon Laser, Semiconductor Laser (qualitative). Applications of laser, holography (Recording and reconstruction)

Photonics: Basics of solid state lighting - LED – Photodetectors – photo voltaic cell, junction & avalanche photo diodes, photo transistors, thermal detectors, Solar cells- I-V characteristics - Optic fibre-Principle of propagation-numerical aperture-optic communication system (block diagram) - Industrial, medical and technological applications of optical fibre. Fibre optic sensors - Basics of Intensity modulated and phase modulated sensors.

Module III: Quantum Mechanics and Superconductivity

Quantum Mechanics: Dual nature of matter, wave function. Uncertainty principle and its applications-formulation of Time dependent and Time independent Schrödinger equations- physical meaning of wave function-Energy and momentum. Operators-Eigen values and functions- One dimensional infinite squarewell potential .Quantum mechanical Tunnelling (Qualitative).

Superconductivity: Superconducting phenomena. Meissner effect. Type-I and Type-II superconductors. BCS theory (qualitative). High temperature superconductors - Josephson Junction-SQUID- Applications of superconductors.

Ultrasonics: Production of ultrasonic waves - Magnetostriction effect and Piezoelectric effect - Magnetostriction oscillator and Piezoelectric oscillator - Detection of ultrasonics - Thermal and piezoelectric methods- Applications of ultrasonics - NDT and medical.

Module IV: Crystal Structure and Special Theory of Relativity

Crystal Structure: Space lattice. Unit cell and lattice parameters. Crystal systems. Co-ordination number and packing factor with reference to simple cubic, body centered cubic and face centered cubic crystals. Directions and planes. Miller indices. Interplanar spacing in terms of Miller indices.

Special Theory of Relativity: Postulates. Lorentz transformation equations (no derivation). Simultaneity. Length contraction. Time dilation. Relativistic mass. Mass energy relation.

References:

1. Upadhyaya J.C., Mechanics, Ram Prasad & Sons
2. Ali Omar M., Elementary Solid State Physics,Pearson
3. Pillai S.O., Solid State Physics,New Age International Publishers
4. Robert Resnick, Introduction to Special Relativity John Wiley & Sons
5. David J Griffiths, Introduction to Electrodynamics, 3/e, Pearson
6. Brij Lal and Subrahmanyam, A Textbook of Optics, S.Chand & Co. Ltd

7. R. Murugeshan, Modern Physics, S. Chand & Co. Ltd
8. G. Aruldhas, Quantum Mechanics, PHI
9. Jafeesh J, Engineering Physics, YCET Publications
10. Ian G Main, Oscillations and waves in Physics
11. Dominic I.&A.Nahari,A Text Book of Engineering Physics,Aswathy Publishers
12. Premlet B., Advanced Engineering Physics, Phasor Books

Internal Continuous Assessment (Maximum Marks-50)

50% - Tests (minimum 2)

30% - Assignments (minimum 3) such as home work, problem solving, quiz, literature survey, seminar, term-project, software exercises, etc.

20% - Regularity in the class

University Examination Pattern:

Examination duration: 3 hours
Maximum Total Marks: 100
The question paper shall consist of 2 parts.
Part A (20 marks) - Ten Short answer questions of 2 marks each. All questions are compulsory. There should be at least two question from each module and not more than three questions from any module.
Part B (80 Marks) - Candidates have to answer one full question out of the two from each module. Each question carries 20 marks.
Note: Each question may contain sub-questions.

Course Outcome:

Familiarity with the principles of Physics and its significance in engineering systems and technological advances. At the end of the course, the students will be familiar with the laws of Physics and its significance in engineering systems and technological advances.

18.103 ENGINEERING CHEMISTRY (FTR)

Teaching Scheme: 2(L) - 1(T) - 0(P) **Credits: 4**

Course Objective:

- *To impart sound knowledge in the different fields of theoretical chemistry so as to apply it to the problems in engineering field.*
- *To develop analytical capabilities of students so that they can characterize, transform and use materials in engineering and apply knowledge gained in solving engineering problems.*

MODULE I

Engineering Materials:-

High Polymers:- Introduction, Addition and Condensation polymers. Copolymers - SBR, ABS - Structure and properties. Conducting Polymers – Polyacetylene and Polyaniline - Preparation, structure and properties. OLED – introduction. Advanced Polymers – Kevlar, Polybutadiene rubber and silicone rubber- Preparation, structure and properties.

Nanomaterials: – Definition, classification, and preparation - LASER ablation method. Applications – Carbon Nano Tubes and fullerenes.

Electrochemistry: Different types of electrodes (general) – SHE, Calomel electrode and determination of E^0 using SHE & Calomel electrode. Electrochemical series and its applications. Nernst equation for an electrode- Derivation & numericals. Lithium ion cell and Fuel cell. Mechanism of electrochemical corrosion - Different methods of corrosion control.

MODULE II

Instrumental Methods of Analysis:

Spectroscopy:- Types of spectra, Introduction, Beer Lamberts Law-Numerical problems. UV-Visible spectroscopy - Principle, Instrumentation and Applications. IR spectroscopy - Principle and Applications - Determination of force constant. NMR spectroscopy – Principle, Applications of NMR including MRI

Thermal analysis :- Principle, Instrumentation and Applications of TGA and DTA.

Chromatographic methods :- Basic principles, Instrumentation and Applications of GC and HPLC.

MODULE III

Fuels :- Calorific Value, HCV and LCV - Determination of calorific value of a solid and liquid fuel by Bomb calorimeter. Liquid fuel - Petrol and Diesel - Octane number & Cetane number. Biodiesel. Natural gas.

Lubricants :- Introduction - Solid, Semisolid and Liquid lubricants. Properties of lubricants - Viscosity Index, Flash point, Fire point, Cloud point, Pour point and Aniline point.

Cement :- Manufacture of Portland cement. Theory of setting and hardening of cement.

MODULE IV

Air pollution :- Sources , controlling measures of air pollution.

Water Technology :- Types of hardness, Estimation of Hardness – EDTA method. Water softening methods - Ion exchange process - Principle. Polymer ion exchange. Reverse Osmosis. Municipal water treatment. Disinfection method by chlorination, using ozone, and UV. Dissolved oxygen, BOD and COD. Sewage water Treatment - Trickling Filter and UASB process.

References:

1. H.H. Willard , L.L. Merrit, J.A. Dean and F.A. Settle; Instrumental Methods of Analysis, CBS Publishers.
2. Vogel; Qualitative Inorganic Analysis, Prentice Hall.
3. De A.K.; Environmental Chemistry, New Age International Pvt. Ltd.
4. Klabunde K.J.; Nanoscale Materials in Chemistry, Wiley-Interscience.
5. Gowarikar V.R.; Polymer Science, New Age International.
6. Van Vlack L.H.; Elements of Material Science and Engineering, Addison-Wesley Publishing Co.
7. Glasstone S.; The Text Book of Physical Chemistry, MacMillan
8. Jain P.C., Jain M; Engineering Chemistry, Dhanpat Rai Publishing Co.
9. Shashi Chawla ; A Text Book of Engineering Chemistry, Dhanpat Rai Publishing
10. Ahad, J.; Engineering Chemistry, Jai Publications.
11. Annette Fernandez, M.Muhammed Arif, H. Badarudeen Rawther and Kavitha P. Nair; Engineering Chemistry, Five Star Publishers

Internal Continuous Assessment (Maximum Marks-50)

50% - Tests (minimum 2)

30% - Assignments (minimum 3) such as home work, problem solving, quiz, literature survey, seminar, term-project, software exercises, etc.

20% - Regularity in the class

University Examination Pattern:

Examination duration: 3 hours

Maximum Total Marks: 100

The question paper shall consist of 2 parts.

Part A (20 marks) - Ten Short answer questions of 2 marks each. All questions are compulsory. There should be at least two question from each module and not more than three questions from any module.

Part B (80 Marks) - Candidates have to answer one full question out of the two from each module. Each question carries 20 marks.

Note: Each question may contain sub-questions a), b) etc.

Course Outcome:

At the end of the course,

1. The confidence level of students will be improved to tackle problems in engineering field related to chemical aspects.
2. The students gain capability in fabricating novel materials with properties that find various engineering applications.
3. The students will be equipped to take up chemistry related topics as part of their project works during higher semesters of the course.

18-104 ENGINEERING GRAPHICS (FRT)

Teaching Scheme: 1(L) - 0(T) - 2(P) **Credits: 3**

Course Objective:

This course provides students basic knowledge of the graphical language used by engineers and technologists globally and helps the students to develop the skill to understand, communicate and document through the language of engineering drawing.

Module – I

Introduction: Introduction to technical drawing and its language. Lines, lettering, dimensioning, scaling of figures, symbols and drawing instruments. (1 sheet practice)

Plain Curves: Conic sections by eccentricity method. Construction of ellipse, parabola, hyperbola (General method only).Construction of Tangent and Normal at any point on these curves.

Miscellaneous Curves: Construction of Cycloid, Epicycloid and Hypocycloid, Involute of a circle. Archimedean spiral, Logarithmic spiral.Construction of Tangent and Normal at any point on these curves.

Module – II

Projection of Points and Lines: Types of projections, Principles of Orthographic projection. Projections of points and lines.Determination of true length, inclination with planes of projection and traces of lines.

Projection of Solids: Projection of simple solids such as prisms, pyramids, cone, cylinder, tetrahedron, and also their combinations. Projection of solids on auxiliary inclined plane or auxiliary vertical plane.

Module – III

Auxiliary Projection of Solids: Auxiliary projection of simple solids such as prisms, pyramids, cone, cylinder, tetrahedron and octahedron inclined to both reference planes.

Sections of Solids: Types of cutting planes, section of simple solids cut by parallel, perpendicular and inclined cutting planes. Their projections and true shape of cut sections. Development of Surfaces:

Development of surfaces of (i) simple solids like prisms, pyramids, cylinder and cone (ii) Cut regular solids.

Module – IV

Isometric Projection: Isometric scale, Isometric view and projections of simple solids like prisms, pyramids, cylinder, cone sphere, frustum of solids and also their combinations.

Intersection of Surfaces: Intersection of Surfaces of two solids - (i) Cylinder and cylinder, (ii) Prism and prism and (iii) Cone and Cylinder.

(Note: Only cases where the axes are perpendicular to each other and intersecting or with offset.)

Perspective Projection: Principles of perspective projection, definition of perspective terminology. Perspective projection of simple solids like prisms, pyramids, with axis perpendicular to ground plane, auxiliary ground plane or picture plane.

CAD: Introduction to CAD systems, Benefits of CAD, Various software for CAD, listing the computer technologies that impact on graphical communication, Demonstrating knowledge of the theory of CAD software [such as: The Menu System, Toolbars (Standard,Object Properties, Draw, Modify and Dimension), Drawing Area (Background, Crosshairs,Coordinate System), Dialog boxes and windows, Shortcut menus (Button Bars), TheCommand Line (where applicable), The Status Bar, Different methods of zoom as used in CAD, Select and erase objects.; Isometric Views of lines, Planes, Simple and compoundSolids].

General Note: First angle projection to be followed.

References:

1. Anil Kumar K.N., Engineering Graphics ,Adhyuth Narayan Publishers, Kottayam.
2. Varghese P.I, Engineering Graphics, VIP Publishers, Thrissur.
3. Bhatt N.D, Engineering Drawing, Charotar Publishing House Pvt. Ltd, Anand.
4. Shah M.B & B.C Rana, Engineering Drawing, Dorling Kindersley (India) Pvt. Ltd. New Delhi.
5. John K.C., Engineering Graphics, Prentice Hall India Publishers.

6. Venugopal K., Engineering Drawing & Graphics, New Age International Publishers.
7. Benjamin J., Engineering Graphics, Pentex publishers
8. Thamaraselvi, Engineering Drawing Graphics, S.K Kataria and Sons, New Delhi.
9. Gopala Krishna K.R., Engineering Drawing, Subhas Stores, Bangalore

Internal Continuous Assessment (Maximum Marks-50)

40% - Tests (minimum 2)

40% - Class work

20% - Regularity in the class

University Examination Pattern:

Examination duration: 3 hours Maximum Total Marks: 100

1. Candidates have to answer one question out of two, each from Module I and Module II. Each question carries 16 marks.

2. Candidates have to answer two questions out of three, each from Module III and Module IV (except from CAD). Each question carries 17 marks.

3. Distribution of Marks: Module I 1 x 16 = 16 Marks
Module II 1 x 16 = 16 Marks
Module III 2 x 17 = 34 Marks
Module IV 2 x 17= 34 Marks

Course Outcome:

At the end of the course, the students will be familiar with all aspects of technical drawings. This course is designed to address:

- to prepare you to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- to prepare you to communicate effectively
- to prepare you to use the techniques, skills, and modern engineering tools necessary for engineering practice

The student will learn:

- Introduction to engineering design and its place in society
- Exposure to the visual aspects of engineering design
- Exposure to engineering graphics standards
- Exposure to solid modelling

18.105ENGINEERING MECHANICS (FTR)

Teaching Scheme: 2(L) - 1(T) - 0(P) **Credits: 4**

Course Objectives:

- *To apply the principles of mechanics to practical engineering problems.*
- *To identify appropriate structural system for studying a given problem and isolate it from its environment.*
- *To develop simple mathematical model for engineering problems and carry out static analysis.*

Module – I

Statics: Fundamental concepts and laws of mechanics – Rigid body –Principle of transmissibility of forces.
Coplanar force systems - Moment of a force – Principle of moments.
Resultant of force and couple system – Lami's Theorem, Method of Resolution.
Equilibrium of rigid body – Free body diagram – Conditions ofequilibrium in two dimensions – Two force and three force members.
Force systems in space – Degrees of freedom – Free body diagram –Equations of equilibrium – Simple resultant and Equilibrium problems.

Module – II

Types of supports – Problems involving point loads and uniformlydistributed loads only.
Properties of planar surfaces – Centroid and second moment of area (Derivations not required) - Parallel and perpendicular axis theorem –Centroid and Moment of Inertia of composite area – Radius of Gyration – Mass moment of Inertia of cylinder and thin disc (no derivation required)Theorems of Pappus and Guldinus.
Friction – Characteristics of dry friction – Problems involving friction ofladder, wedges and connected bodies.
Definition of work and virtual work – Principle of virtual work for asystem of connection bodies – Problems on determinate beams only.

Module – III

Dynamics: Rectangular and Cylindrical co-ordinate system
Combined motion of rotation and translation – Concept of instantaneous centre – Motion of connecting rod of piston and crank of a reciprocatingpump.
Rectilinear translation – Newton's second law – D'Alembert's Principle– Application to connected bodies (Problems on motion of lift only).

Work, Power & Energy – Work-Energy Principle – Impulse, Momentum, Collision of Elastic Bodies – Law of Conservation of Momentum – Direct and Oblique Impacts between elastic bodies and Impact with fixed plane.

Module – IV

Relative Velocity: Basic concepts – Analysis of different types of problems Mechanical vibrations – Free and forced vibration - Degree of freedom. Simple harmonic motion – Spring-mass model – Period – Stiffness –Frequency – Simple numerical problems of single degree of freedom.

References Books:

- Babu, J., Engineering Mechanics, Pearson PrenticeHall
- Beer and Johnson, Vector Mechanics for Engineers - Statics and Dynamics, Tata McGraw Hill Publishing CompanyLimited
- Benjamin J., Engineering Mechanics, Pentex Book Publishers andDistributors
- Bhavikkatti, S. S., Engineering Mechanics, New Age InternationalPublishers
- Hibbeler, R. C., Engineering Mechanics: Statics and Dynamics. Pearson PrenticeHall
- Kumar, K. L., Engineering Mechanics, Tata McGraw Hill Publishing CompanyLimited
- Merriam J. L. and KraigeL. G., Engineering Mechanics – Vol. I and II, JohnWiley
- Rajasekaran S. and Sankarasubramanian, G., Engineering Mechanics, Vikas Publishing House PrivateLimited
- Tayal, A. K., Engineering Mechanics- Statics and Dynamics, Umesh Publications

Internal Continuous Assessment (Maximum Marks-50)

50% - Tests (minimum 2)

30% - Assignments (minimum 3) such as home work, problem solving, quiz, literature survey, seminar, term-project, etc.

20% - Regularity in the class

University Examination Pattern:

Examination duration: 3 hours
Maximum Total Marks: 100
The question paper shall consist of 2 parts.

Part A (20 marks) - Five Short answer questions of 4 marks each. All questions are compulsory. There should be at least one question from each module and not more than two questions from any module.

Part B (80 Marks) - Candidates have to answer one full question out of the two from each module. Each question carries 20 marks.
Note: Each question may contain sub-questions a), b) etc. Descriptive questions should not exceed 40%.

CourseOutcomes:

After successful completion of this course,

- Students will be able to apply and demonstrate the concepts of mechanics to practical engineering problems.
- Students will be able to determine the properties of planes and solids.
- Students will be able to apply fundamental concepts of dynamics to practical problems.

18.106BASIC CIVIL ENGINEERING (FTR)

Teaching Scheme: 2(L) - 1(T) - 0(P) **Credits: 4**

Course Objectives:

- *To provide the students an overview of the profession of Civil Engineering.*
- *To give the students an illustration of the use and properties of various building materials and explain the building construction aspects.*

Module – I

General introduction to Civil Engineering – History of Civil Engineering – Relevance of Civil Engineering in the overall infrastructural development of the country.
Types and classification of structures - buildings, towers, chimneys, bridges, dams, retaining walls, watertanks, silos, roads, railways, runways and pipelines (Brief description only)
Selection of site - Components of a building and their functions -Setting out of a building.
Foundation – Different types – Pile Foundation (description only)

Module – II

Stones: Classification of stones - Qualities of good building stones - Quarrying -Dressing - Tests - Specifications - Uses of commonbuilding stones.
Bricks: Composition of good brick earth - Classification - Qualities ofgood bricks - Field and laboratory tests - Specifications.
Tiles: Classification - Manufacture - Properties - Tests - Specifications

Module – III

Cement: Basic Ingredients – Manufacturing process - Grades -Properties - Tests - Specifications.
Aggregates: Fine and coarse aggregate - Properties - Uses - Tests.
Cement Mortar: Types and preparation.
Stone Masonry: Types - Details of Ashlar, Random Rubble, CoarseRubble and Dry Rubble Masonry.
Brick Masonry: Types - Bond - Introduction to all types of bonds - English bond in detail (1 and 1½ brick walls) - Comparison of stoneand brick masonry.

Module – IV

Timber: Properties - Uses - Classification - Seasoning - Defects -Preservation - Tests; Hard board and Particle board - Manufacture and use.

Steel: Structural steel and steel as reinforcement - Types - Properties -Uses - Market forms.

Floors and Flooring materials: Different types and selection of floors and floor coverings.

Roofs and roof coverings: Different types of roofs - Suitability – Types and selection of roofing materials.

References Books:

- Chen, W. F. and Liew, J. Y. R., (Eds.), The Civil Engineering Handbook, Second Edition, CRC Press (Taylor and Francis)
- Dalal, K. R., Essentials of Civil Engineering, Charotar Publishing House
- Gopi, S., Basic Civil Engineering, Pearson Publishers
- Kandya, A. A., Elements of Civil Engineering, Charotar Publishing house
- Mamlouk, M. S. and Zaniewski, J. P., Materials for Civil and Construction Engineering, Pearson Publishers.
- McKay, W. B. and McKay, J. K., Building Construction Volumes 1 to 4, Pearson India Education Services
- Rangwala, S. C. and Dalal, K. B., Engineering Materials, Charotar Publishing house
- Rangwala, S. C. and Dalal, K. B., Building Construction, Charotar Publishing house

Internal Continuous Assessment (Maximum Marks-50)

50% - Tests (minimum 2)

30% - Assignments (minimum 3) such as home work, problem solving, quiz, literature survey, seminar, term-project, etc.

20% - Regularity in the class

University Examination Pattern:

Examination duration: 3 hours

Maximum Total Marks: 100

The question paper shall consist of 2 parts.

Part A (20 marks) - Five Short answer questions of 4 marks each. All questions are compulsory. There should be at least one question from each module and not more than two questions from any module.

Part B (80 Marks) - Candidates have to answer one full question out of the two from each module. Each question carries 20 marks.

Note: Each question may contain sub-questions a), b) etc. Descriptive questions should not exceed 40%.

Course Outcomes:

After successful completion of this course,

- Students will be able to explain the importance of Civil Engineering in the infrastructural development of the society.
- They will be able to illustrate the types, uses and properties of various building materials.
- Students will be able to explain the method of construction of different components of a building.

18.107 BASIC MECHANICAL ENGINEERING (FRT)

Teaching Scheme: 2(L) - 1(T) - 0(P) **Credits**: 4

Course Objective:

This subject covers wide areas of Mechanical Engineering and is intended for exposing the students to the various theoretical and practical aspects of thermal engineering, fluid mechanics and machines, manufacturing and power transmission.

Module – I (Thermodynamics and Fluid Mechanics)

Thermodynamics: Basic concepts, properties, process and cycles- Zeroth, first and second laws of thermodynamics- Concept of reversibility and entropy - Carnot cycle - Pressure-Volume and Temperature-Entropy diagrams - Steady flow process and significance of flow work. Heat engine, heat pump and refrigerator – efficiency, Coefficient of Performance(COP)

Fluid Mechanics: Properties of fluids, density, viscosity and surface tension- Simple problems on properties- Pascal's law- Stream lines- laminar and turbulent flows- steady and incompressible flow- continuity, Euler and Bernoulli's equations-Applications and simple problems (no derivations).

Module – II (**Energy conversion systems**)

Air cycles: Otto and Diesel cycles-Air standard efficiency (simple problems)

IC Engines: Working and comparison of two stroke and four stroke petrol and diesel engines - general description of various systems using block diagrams, air system, fuel system, ignition system - Brief description of CRDI, MPFI, GDI and Hybrid Vehicles (general description only).

Steam boilers: Classification – Cochran boiler, Babcock and Wilcox boiler, Benson boiler

Module – III (Fluid Machines and Thermal Engineering)

Fluid machines: Centrifugal and reciprocating pumps- Hydraulic turbines-Reaction and Impulse turbines-Pelton, Francis and Kaplan turbines - Reciprocating and centrifugal compressors - fans and blowers-Rotary compressors.

Thermal Engineering: Steam turbines, Gas turbine cycles, open and closed gas turbines, T-S diagram, Efficiency, Applications.

Refrigeration & Air Conditioning: Vapour compression refrigeration system-Refrigerants, eco friendly refrigerants. Energy Efficiency Rating, Psychrometry,

psychrometric processes, Comfort and Industrial air conditioning, typical window air conditioning unit (general description only).
Power plants: thermal, hydro and nuclear power plants.

Module – IV (Power Transmission and Manufacturing)

Mechanical Power transmission systems: Belt, rope, chain and gear drives-types-ratio of belt tensions, comparison and fields of application, velocity ratio, slip (simple problems). Friction disc, single plate clutch, brakes (types and applications only), gear trains (no derivations)-
Manufacturing processes: Elementary ideas of casting, forging, rolling, welding, soldering and brazing. Machining processes: Lathe- turning, taper turning, thread cutting; shaping, drilling, grinding, milling (simple sketches and short notes). Principle, application and advantages of CNC machine
Non conventional machining: Electro discharge machining (EDM) and Electrochemical machining (ECM)

References:

1. Spalding and Cole, *Engineering Thermodynamics*, Hodder& Stoughton Educational.
2. Gill, Smith and Zuirys, *Fundamentals of IC Engines*, Oxford and IBH publishing Company Pvt. Ltd. New Delhi.
3. Amstead, Ostwald and Begeman, *Manufacturing Processes*, John Wiley & Sons.
4. Crouse, *Automobile Engineering*, Tata Mc-Graw-Hill, New Delhi.
5. Roy and Choudhary, *Elements of Mechanical Engineering*, Media Promoters & Publishers Pvt. Ltd., Mumbai.
6. HajraChoudhary, *Workshop Technology* ,Media Promoters & Publishers Pvt. Ltd. Mumbai.
7. Bansal R.K., *Fluid Mechanics and Machine*, Laxmi Publications Pvt. Ltd. New Delhi.
8. Benjamin J., *Basic Mechanical Engineering*, Pentex Publishers Ltd., Kollam.
9. Balachandran P., *Basic Mechanical Engineering*, Owl publishers.
10. Pravin Kumar, *Basic Mechanical Engineering*, Pearson.

Internal Continuous Assessment *(Maximum Marks-50)*

50% - Tests (minimum 2)
30% - Assignments (minimum 2) such as home work, problem solving, quiz, literature survey, seminar, term-project, software exercises, etc.
20% - Regularity in the class.

University Examination Pattern:

Examination duration: 3 hours Maximum Total Marks: 100
The question paper shall consist of 2 parts. Maximum Total Marks: 100
Part A (20 marks) - Ten Short answer questions of 2 marks each. All questions are compulsory. There should be at least two question from each module and not more than three questions from any module.
Part B (80 Marks) - Candidates have to answer one full question out of the two from each module. Each question carries 20 marks.

Course Outcome:
After the completion of this course, the students will be familiar with various fields of Mechanical Engineering.

18.108 BASIC ELECTRICAL ENGINEERING SYLLABUS (FRT)

Teaching Scheme: 2(L) - 1(T) - 0(P) **Credits**: **4**

COURSE OBJECTIVE:

This course imparts to the students, a basic knowledge in Electrical Engineering with an understanding of fundamental concept.

- *To impart a basic knowledge of electrical quantities, and provide the working knowledge for the analysis of various dc and ac circuits used in electrical and electronic circuits.*
- *Develop selection skill to identify the type of generators or motors required for particular application*
- *Highlight the importance of transformers in transmission and distribution of electric power*
- *Emphasize the effects of electric shock and precautionary measures*
- *To introduce the components of low voltage electrical installations*

MODULE I

Electrical circuit elements (R, L and C), voltage and current sources, Kirchhoff current and voltage laws, analysis of simple circuits with dc excitation, Superposition, Thevenin and Norton Theorems, Star Delta Transformation. Numerical Problems.
Alternating current Fundamentals, Generation of alternating voltages-waveforms, Frequency, Period, RMS and Average values, Peak factor and Form Factor of periodic waveforms, Phasor concepts, Complex Representation (exponential, polar and rectangular forms) of sinusoidal voltages and currents, Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations, Numerical problems.

MODULE II

Complex power: Concept of power factor- Real power, Reactive power, Apparent power, Series and Parallel resonance, Energy, Bandwidth and Quality factor, Variation of admittance and impedance in series and parallel resonant circuits. Numerical problems.
Three phase systems, Generation of three phase voltages ,advantages of three phase systems,Star and Delta Connection, Voltage and Current relations in star and delta connections, Power in three phase circuits. Active and Reactive Power measurement by two wattmeter methods. Numerical Problems.
Electrical and Electronic Measurements: Operating principle of moving coil and moving iron ssinstruments (ammeters and voltmeters), dynamometer type watt meters and energy meters

MODULE III

Transformers: Construction of single phase and three phase transformer (Core type only), losses in transformers, regulation and efficiency,Emf Equation, Ideal and Practical Transformer, Equivalent circuit, Auto-transformer. Numerical Problems
Electrical Machines: DC Generator and Motor, Construction, Working Principle, Types and its Characteristics, Applications.AC Motors: Construction and working of a three-phase induction motor-Squirrel cage and Slip ring induction motor, Significance of torque-slip characteristics, Single-phase induction motor. Construction, working, torque-speed characteristic, Starting methods-Split phase and Capacitor start capacitor run motors.

MODULE IV

Power transmission: Typical electrical power transmission scheme-need for high voltage transmission-(Derivation is not needed, No Problems) Power Distribution: substation equipments, primary and secondary transmission and distribution systems- feeder, service mains. Tariff: Different types of LT and HT consumers, tariff schemes - uniform tariff and differential tariff

Electrical Installations: Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, ELCB, MCCB, Types of Wires and Cables, Earthing. Types of Batteries, Important Characteristics for Batteries.

Suggested Text / Reference Books

(i) D. P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 2010.

(ii) D. C. Kulshreshtha, "Basic Electrical Engineering", McGraw Hill, 2009.

(iii)L. S. Bobrow, "Fundamentals of Electrical Engineering", Oxford University Press,2011.

(iv)E. Hughes, "Electrical and Electronics Technology", Pearson, 2010.

(v) V. D. Toro, "Electrical Engineering Fundamentals", Prentice Hall India, 1989.

(vi) Bhattacharya S.K., Basic Electrical and Electronics Engineering, Pearson Education South Asia, 2012.

(vii)Theraja B.L., A Text Book of Electrical Technology-I, S Chand & Co, New Delhi, 2013.

Internal Continuous Assessment (Maximum Marks-50)

50% - Tests (minimum 2)

30% - Assignments (minimum 3) such as home work, problem solving, quiz, literature survey, seminar, etc.

20% - Regularity in the class

***University Examination Pattern*:**

Examination duration: 3 hours

Maximum Total Marks: 100

The question paper shall consist of 2 parts.

Part A (20 marks) - Ten Short answer questions of 2 marks each. All questions are compulsory. There should be at least two question from each module and not more than three questions from any module.

Part B (80 Marks) - Candidates have to answer one full question out of the two from each module. Each question carries 20 marks.

Note: Each question may contain sub-questions a), b) etc. Descriptive questions should not exceed 40%.

Course Outcomes

After successful completion of this course, the students will be able to have a foundation in the concepts of electrical & magnetic circuits, electrical machines, different power transmission schemes . The student will also be familiar with the basics of electrical wiring systems.

18.109 FOUNDATIONS OF COMPUTING AND PROGRAMMING IN C (FR)

Teaching Scheme: 2(L) - 1(T) - 0(P) **Credits: 4**

Course Objectives:

- *To learn the basics of digital computers*
- *To develop problem solving skill*
- *To learn C programming and solve problems*

Module – I

Introduction to digital computer- Generation of computer, Von Newman concept. Details of functional units of a computer. Storage – primary storage and secondary storage.

Data representation – Number systems – Binary, octal and hexadecimal representations (representation of integers & fractions) - conversion from one system to another - representation of BCD numbers. Simple arithmetic operations (addition, subtraction, multiplication and division) on each representation. Floating point representation –signed number representation, normalization, arithmetic operations. Representation of characters in computer – ASCII, EBCDIC**.**

Module – II

Introduction to programming languages: Types of programming languages - high level language, assembly language and machine language System software - Operating systems – objectives of operating systems, compiler, assembler and interpreter (overview).

Problem solving strategies: Problem analysis – formal definition of problem – Solution –top down design. Overview of the solution to the sub problems by writing step by step procedure (algorithm). Representation of procedure by flowchart. Implementation of algorithms – use procedures to achieve modularity. Examples for algorithms and flow charts.

Programming: Selection of appropriate variable names for memory address, documentation of programs, debugging, different types of errors, program testing and verification (overview).

Module – III

Introduction to C Language: Preprocessor directives- macros, header files, data types and qualifiers. Operators and expressions. Data input and output, control statements, arrays and strings. structures, unions, enumerated data type. Example programs including bubble sort, selection sort, linear search and binary search, two dimensional array, matrix operations etc.

Module – IV

Pointers: Array of pointers, pointers to structures, pointer arithmetic. Functions – function definition and function prototype. Function call-- call by value and call by reference. Pointer to a function – array and pointers as arguments of a function. Recursive function. Storage classes: auto, extern, static and register modifiers. Dynamic memory allocation. Functions for implementation of stack and queue operations using array. Bitwise operations.
Data files: formatted, unformatted and text files. Introduction to command line arguments, typedef.

References:

1. Rajaraman V., Computer Basics and Programming in C, PHI.
2. Anita Goel and Ajay Mittal, Computer fundamentals and Programming in C., Pearson.
3. Gottfried B.S., Programming with C, Schaum Series, Tata McGraw Hill.
4. Stewart Venit and Elizabeth Drake, Prelude to Programming – Concepts & Design, Pearson.
5. Dromy R.G., How to Solve it by Computer, Pearson.
6. Morris Mano M., Digital Logic and Computer Design, PHI, 2003.
7. Kernighan and Ritche D.M., The C. Programming Language, PHI.
8. Rajaraman V., Fundamentals of Computers, PHI.
9. Maureen Sprankle, Problem Solving & Programming Concepts, Pearson.
10. Harry H. Cheng, C for Engineers and Scientists - An Interpretive Approach, McGraw Hill.
11.Sabu G R, A Textbook of Computer programming in C, Technostar publication

Internal Continuous Assessment (Maximum Marks-50)

50% - Tests (minimum 2)

30% - Assignments (minimum 3) such as home work, problem solving, quiz, literature survey, seminar, term-project, software exercises, etc.

20% - Regularity in the class

University Examination Pattern:

Examination duration: 3 hours
Maximum Total Marks: 100
The question paper shall consist of 2 parts.
Part A (20 marks) - Ten Short answer questions of 2 marks each. All questions are compulsory. There should be at least two question from each module and not more than three questions from any module.
Part B (80 Marks) - Candidates have to answer one full question out of the two from each module. Each question carries 20 marks.
Note: Each question may contain sub-questions a), b) etc. Descriptive questions should not exceed 40%.

Course Outcomes:

After successful completion of this course,

- The students gain fundamental knowledge in computer science and problem solving skill which is a pre requisite for higher semester courses.

- The students will be able to write efficient algorithms and draw flowcharts for any programming exercises that they encounter in the various engineering applications.

- The students will be able to analyze different programs written for the same problem.

18.109 SEMICONDUCTOR DEVICES (T)

Teaching Scheme: 3(L) - 1(T) - 0(P) **Credits: 4**

Course objective:

- *To provide an insight into the basic semiconductor concepts*
- *To provide a sound understanding of current semiconductor devices and technology so that their applications to electronics and optoelectronics circuits and systems can be appreciated.*

Module - I

Elemental and compound semiconductor materials: Energy bands in solids, intrinsic and extrinsic semiconductors, Variation of Energy band gap with alloy composition. Energy momentum relation for electrons in solids, effective mass. Fermi-dirac distribution. Equilibrium and steady state conditions, Equilibrium concentration of electrons and holes (*graphical and analytical representation*), Temperature dependence of carrier concentration.

Carrier transport in semiconductors – drift, conductivity and mobility, variation of mobility with temperature and doping, High Field Effects, Hall Effect.

Excess carriers in semiconductors – Generation and recombination mechanisms of excess carriers, quasi Fermi levels, diffusion, Einstein relations. Continuity equations,
Diffusion length, Gradient of quasi Fermi level.

Module - II

PN junctions - Contact potential, Electrical Field, Potential and Charge Density at the junction, Energy band diagram, Minority Carrier Distribution, Ideal diode equation, Electron and hole component of current in forward biased p-n junction.

Forward and reverse characteristics of PN Junction diode. Piecewise linear model of a diode, Effect of Temperature on I-V characteristics. Diode capacitances, switching transients.

Electrical Breakdown in PN junctions – Zener and avalanche break down (*abrupt PN junctions only*), junction capacitance, tunnel diode(basics only).

Metal Semiconductor contacts, Energy band diagram of Ohmic and Rectifying Contacts, Current Voltage characteristics, Comparison with PN Junction Diode.

Module - III

Bipolar junction transistor - Current components, Minority Carrier Distributions basic parameters, Evaluation of terminal currents and dc parameters (*based on physical dimensions*), Switching, Base width modulation, Avalanche multiplication in collector-base junction,
Punch Through, Base resistance, Static I-V characteristics of CB and CE configurations.

Field Effect Transistors: JFET - Principle of operation, current equation, static I-V characteristics, and device parameters.

Module - IV

MOSFET- Basic structure and principle of operation, I-V characteristics, Sub threshold characteristics, Derivation of Drain Current (Square Law Model Only) and device parameters.

UJT- Structure, equivalent circuit, characteristics, principle of operation, FinFET-structure and operation.

References:

1. Streetman and Banerjee, Solid State Electronic Devices, Prentice Hall of India, 6/e, 2010.
2. Tyagi M.S., Introduction to Semiconductor Materials and Devices, Wiley India, 5/e, 2008.
3. Warner and Grung, Semiconductor Device Electronics, Holt Rinehart and Winston, 1991.
4. Sze S.M., Physics of Semiconductor Devices, John Wiley, 3/e, 2005.
5. Bhattacharya., Sharma, Solid State Electronic Devices, Oxford University press,2012.
6. Suresh Babu V., Solid State Devices & Technology, Sanguine, 2005.
7. Somanathan Nair, Solid State Devices, Prentice Hall of India, 2/e, 2010.
8. Kano, Semiconductor Devices, Prentice Hall of India, 2009.
9. Neamen, Semiconductor Physics and Devices, McGraw Hill, 4/e, 2009.
10. Pierret, Semiconductor Devices Fundamentals, Pearson, 2006.

Internal Continuous Assessment (Maximum Marks-50)

50% - Tests (minimum 2)

30% - Assignments (minimum 2) such as home work, problem solving, quiz, literature survey, seminar, term-project, software exercises, etc.

20% - Regularity in the class.

University Examination Pattern:

Examination duration: 3 hours

Maximum Total Marks: 100

The question paper shall consist of 2 parts.

Part A (20 marks) - Ten Short answer questions of 2 marks each. All questions are compulsory. There should be at least two question from each module and not more than three questions from any module.

Part B (80 Marks) - Candidates have to answer one full question out of the two from each module. Each question carries 20 marks.

Note: Question paper should contain minimum 50% and maximum 70% Analysis and Problems.

Course Outcome:

After completion of the course, the students will have a good knowledge in Semiconductor theory and electronic devices.

18.110 – ENGLISH (FTR)

Teaching Scheme: 2(L)-1(T)-0(P) Credits 3

Course Objective:-

The purpose of this course is to enable the student to develop communicative skills and command over English language for better performance in Examinations, Group discussions as well as interviews. It will also help to develop leadership qualities and initiatives to develop various skills.

Module 1

Vocabulary Building

Concept of word formation

- Root words from Foreign languages and their use in English.
- Acquaintance with prefixes and suffixes from foreign languages in English to form Derivatives.
- Synonyms and antonyms and standard abbreviations.

Module 2

Basic writing Skills

- Sentence structures
- Use of phrases and clauses in sentences
- Importance of proper punctuations
- Creating coherences, organizing principles of paragraphs in documents
- Techniques for writing precisely.

Module3

- Identifying common errors in writing
- Subject-verb agreement
- Noun-pronoun agreement
- Misplaced modifiers
- Articles & prepositions.

Module 4

Writing practices

- Comprehension
- Precise writing
- Essay writing

Module 5

Oral Communication (This is not included in University examinations but it will be taken for internal assessment)

- Listening Comprehension
- Pronunciation, Intonation, stress and rhythm
- Common everyday situations: Conversations and dialogues
- Communication at work place.
- Interviews
- Formal Presentations

Suggested Readings

1) *Practical English usage*. Michael Swan. OUP.1995.
2) *Remedial English Grammer.*F.T.Wood Macmillan. 2007.
3) *Study writing* Liz Hamp-Lyons and Ben Heasly. Cambridge University Press.2006.
4) *Communication skills.* Sanjay Kumar and Pushp Lata, Oxford University Press.2011.
5) *Exercises in spoken English.*Parts.I-III.CIEFL, Hyderabad.Oxford University Press.

Internal Continuous Assessment (Maximum Marks-50)

50%- Tests (Minimum2)

30%- Assignments (minimum3) such as home work, problem solving ,quiz, literature survey, seminar, term –project etc.

20%- Regularity in the class.

University Examination Pattern:

Examination Duration: 3 Hours

Maximum Total Marks: 100

The question paper shall consists of two parts.

Part A (20 marks)- Five short answer questions of 4 marks each. All questions are compulsory. There should be at least one question from each module and not more than two questions from any module.

Part B (80 marks)-Candidates have to answer one full question out of the two from each module. Each question carries 20 marks.

Note: Each question may contain sub-questions a,b etc. Descriptive questions should not exceed 40%.

Course- Outcomes

After completion of this course the student will acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills.

18.111 MECHANICAL ENGINEERING WORKSHOPS (FRT)

Teaching Scheme: 0(L) - 0(T) - 1(P) **Credits**: 2

Course Objective:

The purpose of this course is to enable the student to have the practical skills for basic workshop practices in mechanical engineering. During the course, the student learns the properties and selection of different materials and acquires the skill in using various tools and measuring devices.

A. **Carpentry**: Study of tools and joints. Practice in planning, chiseling, marking and sawing. Joints – Cross joint, Dove tail joint.

B. **Fitting**: Study of tools, Practice in filing, cutting. Male and female joints.

C. **Foundry**: Study of tools. Preparation of sand, moulding practice and demonstration of casting.

D. **Plumbing**: Study of tools. Details of plumbing work in domestic and industrial applications. Study of pipe joints, cutting, threading and laying of pipes with different fittings using PVC pipes.Use of special tools in plumbing work.

E. **Sheet Metal Work**: Study of tools. Selection of different gauge GI sheets for jobs. Demonstration on preparing tube joints, frustums, trays and containers.

F. **Welding**: Study of welding machines. Straight line practices

G. **Smithy**: Study of tools. Demonstration on forging of square prism, hexagonal bolt, T bolt and Eye bolt.

Internal Continuous Assessment *(Maximum Marks-25)*

40% - Tests

40% - Class Work

20% - Regularity in the class

University Examination Pattern:

Examination duration: 3 hours Maximum Total Marks: 50

For the university examination the student shall be examined in sections A, B and C only.

Course Outcome:

On successful completion of this course the student will be able to

- *Identify and use marking out tools, hand tools, measuring equipment and to work to prescribed tolerances.*
- *Ability to select suitable material for a given purpose applying knowledge of material properties and processing.*
- *Ability to use measuring devices like VernierCalipers, Micrometers, etc.*
- *Ability to fabricate simple components using basic manufacturing processes*
- *Ability to sequence various operations so as to execute the task within minimum time.*
- *Understand and apply workshop safety practices to avoid accidents.*

18.112 BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LABORATORY

Teaching Scheme: 0(L) - 0(T) - 1(P) **Credits**: 2

Course Objective:

- *To enable the student to have the practical skills for Electrical wiring.*
- *House wiring practice and working of protective devices.*
- *Familiarisation of electrical machines.*
- *Understanding the circuit laws and basic awareness of safety measures.*
- *To impart fundamental knowledge in the use of electronic components to set up circuits by soldering and testing them.*

List of Experiments/Demonstrations

1) Basic safety precautions. Introduction and use of measuring instruments – voltmeter, ammeter, multi-meter, oscilloscope.
2) Study of basic electronics components and circuit symbols: Real-life resistors, capacitors, diodes, transistors etc.
3) Study of CRO
4) Study of electrical wiring systems-. Simple wiring circuits
5) To verify KVL and KCL
6) Verification of Network theorems
7) Measurement of power in a three phase circuit by two wattmeter Method
8) Calibration of Energy Meter/Wattmeter/Voltmeter/Ammeter
9) Resonance in R-L-C Circuits
10) Measurement of efficiency of a single phase transformer by load test
11) Study of characteristic of DC Motor.
11) Study of Three phase Induction Motor
12) Assembling of simple electronic circuits: a. Half wave rectifier circuit b. Full wave rectifier circuit
13) Simple LED flashing circuit using Transistors / ICs
14) Soldering practice

References:

1) Basic Electrical Engineering - D.P. Kothari and I.J. Nagrath, 3rd edition 2010, Tata McGraw Hill.
2) Basic Electrical Engineering - D.C. Kulshreshtha, 2009, Tata McGraw Hill.
3) Fundamentals of Electrical Engineering, L.S. Bobrow, Oxford University Press, 2011
4). Dhogal P.S., Basic Electrical Engineering -I, Tata McGraw Hill, 2011.
5) Singh R.P., Electrical Workshop -Safety, Commissioning, Maintenance & Testing of Electrical equipment, I. K. International (P) Ltd, 2013.

6) Raina R. B. and S. K. Bhattacharya, Electrical Design Estimating and Costing, New Age International (P) Limited.
7) Giridharan M. K, Electrical Systems Design, I. K. International (P) Ltd.,2013
8) Bhargava N.N.,Basic Electronics and Linear Circuits, Tata McGraw Hill

Internal Continuous Assessment (Maximum Marks-25)

40% - Tests
40% - Class Work
20% - Regularity in the class

University Examination Pattern:

Examination duration: 3 hours Maximum Total Marks: 50
For university examination, the following guidelines should be followed:
Wiring diagram/circuit diagram – 25%
Wiring / Soldering - 20%
Performance -15%
Result - 20%
Viva voce - 20%

Course Outcome:

Get an exposure to common electrical components and their ratings.

- Make electrical connections by wires of appropriate ratings
- Identify electrical symbols and measuring instruments.
- Identify the basic components of electronics circuits
- Analysis of various ac and dc circuits used in electrical and electronics systems.
- Understand the basic characteristics of transformers and electrical machines.