

## **Fundamentals of Management BE-101**

### **Objective**

The objective of this course is to help the students gain understanding of the functions and responsibilities of the manager, provide them tools and techniques to be used in the performance of the managerial job, and enable them to analyze and understand the environment of the organization.

### **Unit-I**

An Introduction : Management defined, Nature of Management, Functions of Management, Management thought Management as a profession, Managerial Levels and Roles, Managerial Responsibilities; Characteristics of a Good Manager. Decision making theory, decision making process. Simon's Theory of Administrative Behavior, MBO and MBE.

### **Unit-II**

Meaning and Scope of Accounting: Definition, Objectives, Functions, Book Keeping, Branches of Accounting, Principles of Accounting, Journal Entry, Ledger and Trial Balance. Final Accounts: Trading Account / Manufacturing Account, Profit and Loss Account, Balance Sheet

### **Unit-III**

Managerial economics – Nature & scope managerial Theory of firm – profit maximization, sales maximization, organizational structure, ownership and control: Market Structure – competition. Production Functions.

### **Unit-IV**

Concept and Perspectives on Human Resource Management; HRM in a changing Environment; Corporate Objectives, Induction; Career and succession planning; Job Analysis and Role Description; 360<sup>0</sup> performance appraisal.

### **Unit-V**

Meaning of Marketing & Sales, Nature and scope of marketing, corporate orientations towards the marketplace, The Marketing environment and Environment scanning, Marketing information systems and Marketing research, Understanding consumer and Industrial Markets.

### **Books Recommended:**

1. Dr. C.B. Gupta **Human Resource Management**, 6<sup>th</sup> Edition Himalaya Publishing House New Delhi.
2. Kreitner, **Management Theory and Applications**, Cengage Learning, India, 2009.
3. Robbins, **Management**, 9th edition Pearson Education, 2008.
4. Abhikary, M. **Business Economics**, New Delhi, Excel Books, 2000.
5. Keat, Paul G. & Philips K.Y. Young, **Managerial Economics**, Prentice Hall, New Jersey, 1996.
6. Koutsoyiannis, A. **Modern Micro Economics**, New York, McMillan, 1991.
7. J.S. Chadan **Principles of Management**
8. Jain. S.P- Introduction to **Financial Accounting**
9. Shukla. M.C & Grewal .T.S- **Advanced Accounting**.
10. Bal/Sahul Das, S. Chand. A New Approach to **Financial Accounting**,
11. Jain/Narang/Agarwal, Kalyani **Financial Accounting**,
12. Kotler, Philip and Armstrong, G. **Principles of Marketing**, New Delhi, Prentice Hall of India, 1997.
13. Kotler, Philip **Marketing Management** Analysis: Planning, Implementation and Control, New Delhi, Prentice Hall of India, 1994.

## **Communication Skills BE-102**

**Course Objectives:** After getting the course the students should be able to:

- Know the process of communication and its components.
- Improve the language skills i.e. Listening Skills, Speaking Skills, Reading Skills and Writing Skills (LSRW).
- Enhance basic and intermediate skills in English language.
- Improve phonetic competence, comprehension skills, presentation skills, group discussion skills etc.
- And build confidence in communicating in English and create interest for life-long learning of the English language.

### **Unit I: Basics of Communication:**

Definition and Process of communication, Kinesics, paralinguistics, proxemics, Verbal and Non verbal communication, Barriers in communication and how to overcome each one of them

### **Unit II: Writing Skills**

Writing of definitions and descriptions of engineering terms Letter writing (applications, enquiry, quotations, tenders, order and complaints), Report writing, Noting and Drafting, email etiquette, Resume Writing etc.

### **Unit III: Reading Skills**

Reading Comprehension exercises pertaining to technical subjects and topics of general interest from daily life and from workplace, skimming and scanning (Min. 5 to be selected by the instructor)

### **Unit IV: Listening Skills**

Process and Principles of listening, Importance types and barriers, listening for meaning, Listening techniques and activities, developing effective listening skills

### **Unit V Speaking Skills (Oral Communication skills)**

Basics of English Phonetics and phonology( IPA symbols and their practice ), Difference between the sounds of English and the Hindi speech pattern, Oral presentations ( Conversation practice through role play, telephone, media, socializing, cultural events, debates, extempore speech, Group discussion etc. )

### **Communication Skills: Practice**

**Course Objective:** The main thrust will be on the production and practice of sounds of English through audio – visual aids and computer software. The instructor will monitor each student separately to enable him/ her to speak English correctly and confidently. Between the fluency and the accuracy, the later will be aimed at first to let the students overcome their inhibitions and fear while speaking English.

The following topics will be covered in the language laboratory sessions:

1. Phonetics symbols and their pronunciation ( The difference between English and Hindi sound patterns )
2. LSRW skills and their practice
3. Body language and practice
4. Oral presentations with the help of PPT
5. Basic Grammar and vocabulary ( synonyms, antonyms, homonyms, sentence completion exercises, idioms, proverbs, phrases) Common errors and mistakes in English

**Final assessment will be based on regular assignments, presentation, oral quiz, interactive sessions and written examination**

#### **Reference Books:**

1. Kumar S and Lata P Communication Skills (2011): New Delhi Oxford University Press
2. Leech, Geoffrey and Jan Svartvik. (2009). A Communicative Grammar of English. New Delhi: Pearson
3. Lesikar R V, Flatley M E ,Rentz K and Pandey(2009): Business Communication: Making Connections in a Digital World New Delhi, Tata McGraw Hill
4. Sadanand Kamlesh and Punitha Sushila (2014) Spoken English: A foundation Course. Hyderabad , Oreint BlackSwan

## Engineering Chemistry BE-103

### UNIT - I

**Water:** Specifications for water, analysis of water – alkalinity, hardness and its determination (EDTA method only). Water for domestic use, Water softening processes – Lime – Soda process, Ion exchange method, boiler feed water, boiler problems-scale, sludge, priming and foaming, caustic embitterment and corrosion, their causes and prevention, removal of silica, removal of dissolved gases, carbonate and phosphate conditioning, colloidal conditioning, calgon treatment, Numerical problems on alkalinity, hardness, Lime-Soda process and Ion exchange method, EDTA method.

[No. of Hrs: 08]

### UNIT - II

**Fuels:** Classification, combustion and chemical principles involved in it, calorific value: gross and net calorific values and their determination by bomb calorimeter.

**Solid Fuels:** Proximate and ultimate analysis of coal and their importance, High and low temperature carbonisation, Coke: Its manufacture by Otto Hoffman oven.

**Liquid Fuels:** Conversion of coal into liquid fuels (Bergius process and Fisher-Tropsch Process) and mechanism, Petroleum: its chemical composition and fractional distillation, cracking of heavy oil residues – thermal and catalytic cracking, knocking and chemical structure, octane number and cetane number and their significance, power alcohol, Numerical on calorific value, combustion, proximate and ultimate analysis of coal.

[No. of Hrs: 08]

### UNIT - III

#### **Environmental Pollution and Control:**

**Air Pollution:** Types of pollutants, source effects, sink and control of primary pollutants – CO, No<sub>x</sub>, HC, So<sub>x</sub> and particulates, effects of pollutants on man and environment – photochemical smog and acid rain.

**Water Pollution:** Classification of pollutants, their sources, waste water treatment – domestic and industrial.

**Soil Pollution:** Composition of soil, classification and effects of soil pollutants and their control.

**Solid Waste Pollution:** Classification, waste treatment & Disposal methods (Composting, sanitary landfilling, thermal processes, recycling and reuse).

**Hazardous Wastes:** Classification – radioactive, biomedical and chemical, treatment and disposal – physical, chemical and biological processes.

[No. of Hrs: 08]

### UNIT - IV

**Polymers:** Introduction to Polymer chemistry: Classification of Polymers and Types of polymerization  
**Plastics:** Constituents of plastics, Thermosets and Thermoplastics, Preparation, Properties and Uses of Polyethylene, Bakelite, Teflon, Terylene and Nylon  
**Elastomers:** Natural rubber, Vulcanization, Synthetic rubber- Preparation, Properties and Applications of SBR, Buna-N, Butyl and Neoprene rubber. Fibers (nylon 6, nylon 66, cellulose fibers, Dacron)

**Glass:** Introduction, Definition of glass, its Properties, Manufacturing of glass, Importance of annealing in glass making, Types of silicate glasses and their commercial uses.

[No. of Hrs: 08]

**UNIT - V**

**Materials Chemistry:**

**Lubricants:** Principles and function of lubricants - Types of Lubrication and Mechanism - Thick Film or Hydrodynamic Lubrication, Thin Film or Boundary Lubrication, Extreme Pressure Lubrication, Viscosity, Redwood Viscometer, Viscosity, flash and fire point, cloud and pour point, aniline point, Neutralization Number and mechanical.Mechanism of lubrication, solid and liquid lubricant, Properties of lubricants, Numerical problems based on viscosity index.

**Cement:** Definition, composition, basic constituents and their significance Manufacturing of Portland cement by Rotary Kiln technology Chemistry of setting and hardening of cement (reactions).

**Refractory:** Definition, classification, Properties of good refractory detailed study of silica and fire clay refractory and their applications.

[No. of Hrs: 08]

**Text Books:**

1. Chemistry in Engineering & Technology (Vol I & II) (Latest ed.), By J.C. Kuriacose& J. Rajaram
2. Environmental Chemistry & Pollution Control (Latest ed.), By S.S. Dara
3. Applied Chemistry (Latest ed.), By H.D. Gesser
4. Engineering Chemistry(Latest ed.), By Jain & Jain
5. Basics of Engineering Chemistry(Latest ed.),By S.S. Dara
6. Text of Engineering Chemistry by S.S. Dara&Mukkati S. Chand &Co,New Delhi(2006)

**Referencebooks:**

1. Engineering Chemistry by B. Siva Shankar Mc.Graw Hill Publishing Company Limited,NewDelhi.
  2. Engineering Chemistry J.C. Kuriacase& J. Rajaram, Tata McGraw Hills co., New Delhi.
  3. Chemistry of Engineering Materials by CV Agarwal,C.P Murthy, A.Naidu, BS Publications.
  4. Chemistry of Engineering Materials by R.P Mani and K.N.Mishra, cengagelearning.
  6. Applied Chemistry – A text for Engineering & Technology – Springar (2005).
  7. Text Book of Engineering Chemistry – ShasiChawla, DhantpatRai publishing Company,NewDelhi.
  8. Engineering Chemistry – R. Gopalan, D. Venkatappayya, and D.V. SulochanaNagarajan–VikasPublishers.
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## **ENGINEERING CHEMISTRY PRACTICAL**

**NOTE: AT LEAST 10 OF THE FOLLOWING CORE EXPERIMENTS MUST BE PERFORMED DURING THE SESSION.**

### **1. WATER TESTING**

- (i) Determination of Total hardness by Complex metric titration method.
- (ii) Determination of mixed alkalinity
  - (a) OH<sup>-</sup> & CO<sub>3</sub><sup>-</sup>
  - (b) CO<sub>3</sub><sup>-</sup> & HCO<sub>3</sub><sup>-</sup>
- (iii) Chloride ion estimation by Argent metric method.

### **2. FUELS & LUBRICANT TESTING**

- (i) Flash & fire points determination by
  - (a) Pensky Martin Apparatus,
  - (b) Abel's Apparatus,
  - (c) Cleveland's open cup Apparatus.
  - (d) Calorific value by bomb calorimeter
- (ii) Viscosity and Viscosity index determination by
  - (a) Redwood viscometer No. 1
  - (b) Redwood viscometer No. 2
- (iii) Proximate analysis of coal
  - (a) Moisture content
  - (b) Ash content
  - (c) Volatile matter content
  - (d) Carbon residue
- (iv) Steam emulsification No & Anline point determination (v) Cloud and Pour point determination of lubricating oil

## Engineering Drawing BE-104

**Scales:** Representative factor, plain scales, diagonal scales, scale of chords.

**Conic sections:** Construction of ellipse, parabola, hyperbola by different methods; Normal and Tangent.

**Special Curves:** Cycloid, Epi-cycloid, Hypo-cycloid, Involute, Archimedean and logarithmic spirals.

### Unit II

**Projection:** Types of projection, orthographic projection, first and third angle projection, **Projection of points and lines**, Line inclined to one plane, inclined with both the plane, True Length and True Inclination, Traces of straight lines.

### Unit III

**Projection of planes and solids:** Projection of Planes like circle and polygons in different positions; Projection of polyhedrons like prisms, pyramids and solids of revolutions like cylinder, cones in different positions.

### Unit IV

**Section of Solids:** Section of right solids by normal and inclined planes; Intersection of cylinders.

**Development of Surfaces:** Parallel line and radial - line method for right solids.

### Unit V

**Isometric Projections:** Isometric scale, Isometric axes, Isometric Projection from orthographic drawing.

**Computer Aided Drafting (CAD):** Introduction, benefit, software's basic commands of drafting entities like line, circle, polygon, polyhedron, cylinders; transformations and editing commands like move, rotate, mirror, array; solution of projection problems on CAD.

### References

1. Visvesvaraya Tech. University; A Premier on Computer Aided Engg drawing; VTU Belgaum
2. Bhatt N.D.; Engineering Drawing, Charotar
3. Venugopal K.; Engineering Graphics; New Age
4. John KC; Engg. Graphics for Degree; PHI.
5. Gill P.S.; Engineering Drawing; kataria
6. Jeyopooan T.; Engineering drawing & Graphics Using AutoCAD; Vikas
7. Agrawal and Agrawal; Engineering Drawing;TMH

## **Basic Electricals & Electronics Engineering BE-105**

**Unit I : Electrical circuit analysis-** Voltage and current sources, dependent and independent sources, source conversion, DC circuits analysis using mesh & nodal method, Thevenin's & superposition theorem, star-delta transformation. 1-phase AC circuits under sinusoidal steady state, active, reactive and apparent power, physical meaning of reactive power, power factor, 3-phase balanced and unbalanced supply, star and delta connections.

**Unit II : Transformers-**Review of laws of electromagnetism, mmf, flux, and their relation, analysis of magnetic circuits. Single-phase transformer, basic concepts and construction features, voltage, current and impedance transformation, equivalent circuits, phasor diagram, voltage regulation, losses and efficiency, OC and SC test.

**Unit III : Rotating Electric machines-** Constructional details of DC machine, induction machine and synchronous machine, Working principle of 3-Phase induction motor, Emf equation of 3-Phase induction motor, Concept of slip in 3-Phase induction motor, Explanation of Torque-slip characteristics of 3-Phase induction motor, Classification of self excited DC motor and generator.

**Unit IV : Digital Electronics-**Number systems used in digital electronics, decimal, binary, octal, hexadecimal, their complements, operation and conversion, floating point and signed numbers, Demorgan's theorem, AND, OR, NOT, NOR, NAND, EX-NOR, EX-OR gates and their representation, truth table, half and full adder circuits, R-S flip flop, J-K flip flop.

**Unit V: Electronic Components And Circuits-** Introduction to Semiconductors, Diodes, V-I characteristics, Bipolar junction transistors (BJT) and their working, introduction to CC, CB & CE transistor configurations, different configurations and modes of operation of BJT, DC biasing of BJT

### **References:**

1. Vincent Del Toro, Electrical Engineering Fundamentals, PHI Learning, II Edition
2. S.Ghosh, Fundamentals of Electrical and Electronics Engineering, PHI, II Edition.
3. Millman, Halkias & Parikh, Integrated Electronics, Mc Graw Hill, II Edition
4. Nagrath & Kothari, Basic Electrical Engineering, III Edition TMH.
5. J.S. Katre, Basic Electronics Engg, Max Pub. Pune.
6. Hughes, Electrical and Electronic Technology, Pearson Education IX Edition



## **LIST OF EXPERIMENT**

1. To study Electrical Symbols.
2. To study the steady state response of series R-L circuit with AC supply and to find impedance, power and power factor of the circuit.
3. To study the steady state response of series R-C circuit with AC supply and to find impedance, power and power factor of the circuit.
4. (a) To verify "Thevenin's Theorem" by finding its Thevenin's equivalent circuit 5V, 10V, 15V.  
(b) Determine the load current for  $R_L = 120 \text{ Ohm}$ ,  $1 \text{ K Ohm}$  &  $390 \text{ Ohm}$ .
5. To study the construction and basic principle of working of a single -phase induction motor.
6. To verify the law of resistance connected in parallel circuit.
7. To verify the law of resistance connected in series.
8. To analyze a two Mesh circuit and to determine the current in each branch of the circuit.

## **Work Shop Practice BE-106**

### **Unit I**

Introduction: Manufacturing Processes and its Classification, Casting, Machining, Plastic deformation and metal forming, Joining Processes, Heat treatment process, Assembly process. Powder Metallurgy, introduction to computers in manufacturing. Black Smithy Shop Use of various smithy tools. Forging operations: Upsetting, Drawing down, Fullering, Swaging, Cutting down, Forge welding, Punching and drafting. Suggested Jobs : Forging of chisel, forging of Screw Driver

### **Unit II**

Carpentry Shop: Timber : Type, Qualities of timber disease, Timber grains, Structure of timber, Timber, Timber seasoning, Timber preservation .Wood Working tools: Wood working machinery, joints & joinery. Various operations of planing using various carpentry planes sawing & marking of various carpentry joints. Suggested Jobs :Name Plate ,Any of the Carpentry joint like mortise or tenon joint

### **Unit III**

Fitting Shop: Study and use of Measuring instruments, Engineer steel rule, Surface gauges caliper, Height gauges, feeler gauges, micro meter. Different types of files, File cuts, File grades, Use of surface plate, Surface gauges drilling tapping Fitting operations: Chipping filling, Drilling and tapping.Suggested Jobs :Preparation of job piece by making use of filling, sawing and chipping , drilling and tapping operations.

### **Unit IV**

Foundry: Pattern Making: Study of Pattern materials, pattern allowances and types of patterns. Core box and core print, .Use and care of tools used for making wooden patterns. Moulding: Properties of good mould & Core sand, Composition of Green , Dry and Loam sand. Methods used to prepare simple green and bench and pit mould dry sand bench mould using single piece and split patterns.

### **Unit V**

Welding: Study and use of tools used for Brazing, Soldering, Gas & Arc welding. Preparing Lap & Butt joints using gas and arc welding methods, Study of TIG & MIG welding processes . Safety precautions.

### **Reference Books:**

1. Bawa HS; Workshop Practice, TMH
2. Rao PN; Manufacturing Technology- Vol.1& 2, TMH
3. John KC; Mechanical workshop practice; PHI
4. Hazara Choudhary; Workshop Practices -, Vol. I & II.
- 5 Jain. R.K. Production Technology –

## **Environment, Ethics & Society**

### **BE-201**

#### **UNIT - I**

##### **Energy- Sources of Energy:**

Renewable & Non Renewable, Fossil fuel, coal, oil, Gas, Geothermal, Hydrogen, Solar, Wind, hydal, nuclear sources.

#### **UNIT - II**

##### **Ecosystem - Segments of Environment:**

Introduction, Atmosphere, hydrosphere, Lithosphere, biosphere. Cycles in Ecosystem - Water, Carbon, Nitrogen. Biodiversity: Threats and conservation, Food Chain.

#### **UNIT - III**

##### **Air Pollution:**

Air Pollution: Air pollutants, classification, (Primary & secondary Pollutants) Adverse effects of pollutants. Causes of Air pollution chemical, photochemical, Green house effect, ozone layer depletion, acid Rain.

**Sound Pollution:** Causes, controlling measures, measurement of sound pollution, Industrial and non - industrial.

#### **UNIT - IV**

**Water Pollution:** Pollutants in water, adverse effects. Treatment of Domestic & Industrial water effluent.

**Soil Pollution:** Soil Profile, Pollutants in soil, their adverse effects, controlling measures.

#### **UNIT - V**

##### **Society & Ethics:**

Impact of waste on society. Solid waste management (Nuclear, Thermal, Plastic, medical, Agriculture, domestic and e-waste). Ethics and moral values, ethical situations, objectives of ethics and its study. Preliminary studies regarding Environmental Protection Acts, Environmental Impact Assessment, Study of Gandhiji Autobiography (Childhood) – My experiments with truth.

#### **REFERENCES:**

1. Harris, CE, Prichard MS, Rabin's MJ, "Engineering Ethics"; Cengage Pub.
2. Rana SVS ; "Essentials of Ecology and Environment"; PHI Pub.
3. Raynold, GW "Ethics in information Technology"; Cengage.
4. Svakumar; Energy Environment & Ethics in society; TMH
5. AK De "Environmental Chemistry"; New Age Int. Publ.
6. BK Sharma, "Environmental Chemistry" ; Goel Publ. House.
7. Bala Krishnamoorthy; "Environmental management"; PHI
8. Gerard Kiely, "Environmental Engineering" ; TMH
9. Miller GT JR; living in the Environment Thomson/cengage
10. Cunningham WP and MA; principles of Environment Sc; TMH
11. Gandhiji M.K.- My experiments with truth.

## Engineering Physics BE-202

### Unit I

**Quantum Physics:** Concept of Quantum theory. Wave-particle duality, Matter waves, Group velocity, phase velocity and their relationship. Uncertainty principle with elementary proof and applications (determination of position of a particle by a microscope, non existence of electron in nucleus, diffraction of an electron beam by a single slit). Compton effect and Compton scattering. Schrodinger wave equation: time independent & dependent, Eigen functions & Eigen values, particle in a box.

### Unit II

**Wave Optics:** Interference: Fresnel's biprism, Interference in thin films (due to reflected and transmitted light), interference from a wedge shaped thin film, Newton's rings and Michelson's interferometer, experiments and their applications. Concept of polarized light, Brewster's law, Nicol prism, quarter & half wave plate.

### Unit III

**Nuclear Physics:** Nuclear properties. Nuclear models: Nuclear liquid drop model (semi empirical mass formula), nuclear shell model, Nuclear fission and Nuclear fission, Chain reaction. Linear Particle accelerators: Cyclotron, general description of Synchrotron, Synchrocyclotron, and Betatron. Geiger-Muller Counter, Uses of Bainbridge and Auston mass Spectrographs.

### Unit IV

**Material Science & Superconductivity:** Dielectric materials, Polarization mechanisms, Dielectric Loss, Piezoelectricity and its Applications, Basic ideas of Dia, Para, Ferro & Ferri, Ferrites, Magnetic Anisotropy, Magnetostriction its applications in production of Ultrasonic waves, Superconductivity, Superconductors as ideal diamagnetic materials, Signatures of Superconducting state, Meissner Effect, Type I & Type II superconductors, London Equations, Introduction to BCS theory. Science of Nanomaterials.

### Unit V

**Lasers & Fibre Optics:** Spontaneous & Stimulated emissions, Einstein's Coefficients, Population Inversion, Pumping Mechanisms, Components of a laser System, Three & four level laser systems; Ruby, He-Ne, CO<sub>2</sub> and semiconductor Lasers. Introduction to Fibre Optics, Acceptance Angle, Numerical Aperture, Normalized frequency, Modes of propagation, material dispersion & pulse broadening in optical fibres, fibre connectors, splices and couplers. Applications of optical fibres.

### **Suggested Readings / Books:**

1. Quantum Physics by Satya Prakash
2. Engineering Physics, Malik; HK, Singh; AK, Tata McGraw Hill,
3. Materials Science & Engg., Raghvan V., Prentice Hall of India.
4. Concepts of Modern Physics, Beiser; A., Mahajan; S., Choudhary; SR, Tata McGraw Hill.
5. Solid State Physics, Dan Wei, Cengage Learning.
6. Introduction to Solids, Azaroff LV, Tata Mc Graw Hill.
7. Physics; A calculus based approach (Vol. I & II) Serway; RA & Jewitt; JW, Cengage Learning. Materials Science & Engineering, Callister; WD, John Wiley & Sons.
8. Lasers & Optical engineering, Dass; P, Narosa Publishers.
9. Optical Fibre system, Technology, Design & Applications, Kao; CK, McGraw Hill.
10. Laser Theory & Applications, Thygrajan; K, Ghatak; AK, Mc Millan India Ltd.

### **List of Experiments:**

1. Newton's Rings.
2. Resolving Powers- Telescope, Microscope and Grating.
3. Spectrometers-R.I, Wavelength, using prism and grating
4. Experiments connected with diodes and transistor.
5. Measurement of energy band gap of semiconductor.
6. Photometer
7. A.C. Mains

## **Basic Mechanical Engineering BE-203**

### **Unit 1 Thermodynamic**

Thermodynamic Statements of I and II laws of thermodynamics and their applications in Mechanical Engineering. Carnot cycle for Heat engine, Refrigerator and Heat pump Thermodynamic work, p-h & T-s work in various processes, p-V representation of various thermodynamic processes and cycles. Ideal gas equations, Properties of pure substance,

### **Unit 2 Engineering Materials**

Materials Used in Engineering and their Applications Metals – Ferrous and Non-Ferrous, Nonmetallic materials, Material selection criteria. Casting, Sheet metal forming, Sheet metal cutting, Forging, Fabrication, Metal joining processes. (Basic elements, Working principle and types of operations)

Lathe Machine – Centre Lathe

Drilling Machine – Study of Pillar drilling machine

Introduction to NC and CNC machines

Grinding machine, Power saw, Milling Machine

### **Unit 3 Fluids:**

Fluid properties, pressure, density and viscosity; pressure variation with depth, static and kinetic energy; Bernauli's equation for incompressible fluids, viscous and turbulent flow, working principle of fluid coupling, pumps, compressors, turbines, positive displacement machines and pneumatic machines. Hydraulic power & pumped storage plants for peak load management as compared to base load plants.

### **Unit 4 I.C. Engines:**

I.C. Engines: Classification of I.C Engines, Different parts of I.C engines, Working of two stroke and four stroke engines-petrol and diesel engines-air intake system, exhaust system, fuel supply system, ignition system, lubrication system, cooling system and engine starting system-Performance of I.C. engines

### **Unit 5 Power transmission**

Power transmission elements: Belt Drive - velocity ratio of belt drive, length of belt, slip in belt-simple problems- Power transmitted- Ratio of tensions- Centrifugal tension Initial tension- Rope drive, chain drive and gear drive-Types of gear trains (simple description only).

### **Reference Books:-**

1. Narula; Material Science; TMH
2. Agrawal B & CM; Basic Mechanical Engg. Wiley India
3. Nag PK, Tripathi et al; Basic Mechanical Engg; TMH
4. Rajput; Basic Mechanical Engg;
5. Sawhney GS; Fundamentals of Mechanical Engg; PHI
7. Nag PK; Engineering Thermodynamics; TMH
8. Ganesan; Combustion Engines; TMH

**List of Suggestive core Experiments (Please Expand it)**

1. Tensile testing of standard mild steel specimen.
2. Experiments on Bernoulli's theorem.
3. Flow measurements by venturi and orifice meters.
4. Study of lathe Machine.
- 5 Study of Milling Machine
- 6 Study of different IC engines & measurement of B.H.P. using rope/belt dynamometer

## Basic Civil Engg. & Engg. Mechanics BE-204

### Unit -I

**Building Materials & Construction** Stones, bricks, cement, lime, timber-their types, properties, tests & uses, laboratory tests of concrete and mortar Materials: Workability and Strength properties of Concrete, Preparation of concrete, compaction, curing, etc. Elements of Building Construction, Foundations:conventional, spread footings, RCC footings, Brick masonry walls, plastering and pointing, floors, roofs, Doors, windows, lintels, staircases – types and their suitability

### Unit – II

**Surveying & Mapping:** Principles of Surveying, Measurement of distances by conventional and EDM methods, Measurement of directions and measurement of elevations by different methods, Plane Table Surveying, Introduction to Theodolite Survey.

### UNIT- III .

**Force, moment, c. G & moment of inertia:** Elastic Body, Laws of Mechanics, Forces & System of Forces, Composition, Resolution & resultant of Forces, Laws of Forces, Lami's Theorem, Moment & Couples, Varignon's Theorem, Free Body Diagram, Centre of Gravity of a Lamina, Centroids of various Geometric Shapes, Moment of Inertia, Radius of Gyration, Parallel and Perpendicular Axis Theorem.

### UNIT- IV

**Frames and trusses:** Introduction, Perfect Frame, Redundant Frame, Reactions of Supports, Plane Trusses, Space Trusses, Method of Joints, Method of Section, Graphical Method- Maxwell Diagram.

### UNIT- V

**Shear force and bending moment:** Introduction, Types of Load – Concentrated, uniformly distributed, uniformly varying load and Combination of loads. Types of beams – Cantilever beam, simply supported beam, overhanging beam; Shear force and bending moment diagrams for the above beams with one type of loading and combination of loading. Point of contra flexure Relationship between load, Shear force and bending moment.

### Reference Books:

1. Shesha Prakash and Mogaveer; Elements of Civil Engg & Engg. Mechanics; PHI
2. R.C. Hibbler – Engineering Mechanics: Statics & Dynamics
3. Beer & Johnston, Vector Mechanics for Engineers –Statics & Dynamics.
4. Civil Engineering materials, TTTI, Chandigarh.
5. Building Materials by S.C. Rangwala- Charotar publications House, Anand
6. Building Construction by Sushil Kumar.



**List of suggestive core Experiments:**

Students are expected to perform minimum ten experiments from the list suggested below by preferably selecting experiments from each unit of syllabus.

**S.No. Title**

1. To perform traverse surveying with prismatic compass, check for local attraction and determine corrected bearings and to balance the traverse by Bowditch's rule.
2. To perform leveling exercise by height of instrument of Rise and fall method.
3. To measure horizontal and vertical angles in the field by using Theodolite.
4. To determine (a) normal consistency (b) Initial and Final Setting time of a cement Sample.
5. To determine the workability of fresh concrete of given proportions by slump test or compaction factor test.
6. To determine the Compressive Strength of brick .
7. To determine particle size distribution and fineness modulus of course and fine Aggregate.
8. To verify the law of Triangle of forces and Lami's theorem.
9. To verify the law of parallelogram of forces.
10. To verify law of polygon of forces
11. To find the support reactions of a given truss and verify analytically.
12. To determine support reaction and shear force at a given section of a simply Supported beam and verify in analytically using parallel beam apparatus.
13. To determine the moment of inertia of fly wheel by falling weight method.
14. To verify bending moment at a given section of a simply supported beam.

## **Computer S/W and H/W Engineering BE-205**

### **Unit-I**

Computer: Definition, Classification, Organization i.e. CPU, register, Bus architecture, Instruction set, Memory & Storage Systems, I/O Devices: types of printers, types of scanner, monitor, keyboard, mouse, Installation of windows XP and windows 7

### **Unit-II**

Introduction to System & Application Software, Operating Systems, types of operating system, Management of File, Process & Memory Multitasking & Multiprogramming, MS word, MS PowerPoint, MS Excel.

### **Unit-III**

Computer Networking: Introduction, Goals, ISO-OSI Model.

Attacks on computers: Introduction to viruses, worms, malware, Trojans, Spyware and Anti-Spyware Software , Different types of attacks like Information Theft, Email spoofing, Denial of Service (DoS), Cyber Stalking, Logic bombs, Hacking Spamming, Cyber Definition . Introduction of Cyber Laws about Internet Fraud, Good Computer Security Habits.

### **Unit-IV**

Introduction to Algorithms, Complexities and Flowchart, Introduction to Programming, Categories of Programming Language, Program Design, Programming Paradigms. Procedure Oriented Programming VS Object oriented Programming.

### **Unit-V**

Electronic Commerce and physical Commerce, Different type of e-commerce, pros of e-commerce Business models: Feature of B2B e-commerce, Business models, Integration. E-Services: category of e-services, Web- enabled services, Matchmaking services, information-selling on the web credit , card payment, E-cash, E-check.

### **References:**

1. Introduction of Computers: Peter Norton, TMH
2. Computer Networks: Andrew Tananbaum, PHI
3. William Stallings, "Cryptography and Network Security: Principles and Practice" Pearson.
4. Henry Chan, Raymond Lee, Tharam Dillon, E-Commerce Fundamental and Applications, Willey Publication.
5. Minoli & Minoli, Web Commerce Technology Hand Book, TMH
6. Fundamentals of Computers : E Balagurusamy, TMH
7. Basic Computer Engineering: Silakari and Shukla, Wiley India
8. Fundamentals of Computers : V Rajaraman, PHI

## List of Experiment

01. Study and practice of Internal & External DOS commands.
02. Study and Practice of MS windows – Folder related operations, My-Computer, window explorer, Control Panel, device manager.
03. Creation and editing of Text files using MS- word.
04. Creation and operating of spreadsheet using MS-Excel.
05. Creation and editing power-point slides using MS- power point
- 06.WAP to illustrate Arithmetic expressions.
- 07 Connections of cable and connectors with different color combination
- 08 Study the basic Input and Output devices.
- 09 Study of internal hardware of CPU
- 10 Installation of windows and bios overview

## **Electrical & Electronics Workshop BE-206**

### **Unit 1 :**

Cables, Connectors and Switches: Introduction, Specifications, types, Applications of cables, connectors and switches.

### **Unit 2 :**

Protective devices: Introduction, Specifications, types, Applications of fuses, relays and MCB

### **Unit 3 :**

Electrical and Electronics Components: Study of Resistors, Capacitors, Inductors, , diodes & Special Diodes, ICs, SMT & SMD and it applications, connections, troubleshooting in electronics equipments.

### **Unit 4 :**

Measuring & testing instruments: Study of Ammeter, voltmeter, multiplexer and CRO. Applications to measuring the physical quantity and testing of electronics components.

### **Unit 5 :**

Electrical wiring & Winding Introduction, Electrical wiring materials, Systems of distribution of electrical energy, Systems of wiring, Selection of wiring system, Distribution of electrical energy in a domestic , electrical installation, Study of wiring tools & accessories, Various types of domestic wiring, Exercise in wiring practice. Study of basics principles for motor winding with practical approach.

### **List of Practicals**

1. Identify different types of cables & test it.
2. Identify different types of connectors & Discover their application.
3. Identify different types of Switches and discover its usage.
4. Identify different types of fuses & test it.
5. Identify different types of Relays and discover its usage.
6. Identify different types of MCB with ratings and discover its usage.
7. Identify, find value using colour code chart and test different types of Resistors.
8. Identify, find value and test different types of capacitors.
9. Identify, find value and test different types of Inductors.
10. Connect Resistor ,capacitor, inductor in series and parallel circuits
11. Draw front panel control of analog and digital multimeter and label it.
12. Demonstrate external controls of CRO & function Generator.
13. Measure amplitude & frequencies of different sine waveform using CRO & Function enerator.
14. Measure amplitude & frequencies of Different square waveform using CRO & Function Generator.
15. Test resistor, capacitor, inductor, P-N junction Diode using CRO & Multimeter.
16. Identify Various IC packages.
17. Identify various SMD components.
18. Interpret data sheet of various P-N junction diode and draw its base diagram.
19. Interpret data sheet of various IC and SMD components.
20. Study of House Wiring.