2nd semester B.Tech Syllabus for Admission Batch 2016-17

| Second Semester | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Theory | | | | | Practical | | |
| **Code** | **Course Name** | **Hours/ week L/T** | **Credit Theory** | **University marks** | **Internal Evaluation** | **Hours/ Week L/T** | **Credit Practical** | **Marks** |
| BS | Applied Mathematics-II | 3-1 | 4 | 100 | 50 | - | - | - |
| BS | Applied Physics/Applied Chemistry | 3-0 | 3 | 100 | 50 | 2 | 1 | 50 |
| ES | Basics of Civil Engineering / Basics of Mechanical Engineering | 3-0 | 3 | 100 | 50 | 2 | 1 | 50 |
| MC & GS | Environmental Studies & Health Care Engineering/ Professional Ethics | 3-0 | 3 | 100 | 50 | | | |
| ES | Electrical & Electronics Engineering | 3 | 3 | 100 | 50 | 2 | 1 | 50 |
| ES | Computer Lab | | | | | 4 | 2 | 100 |
| ES | Engineering Graphics lab./ Engineering Workshop | 2-0 | 1 | - | 50 | 4 | 2 | 100 |
| MC | NSS/NCC/NSO/Yoga | | | | | 2 | 1 | 50 |
| Total | | 18 | 17 | 500 | 350 | 16 | 8 | 350 |
| Total Marks: 1200 | | | | | | | | |
| Total Credits: 25 | | | | | | | | |

# ES/MC -ELECTRICAL & ELECTRONICS ENGINEERING (3-1-0)

**Module I (10 Hours)**

**University Portion (80%)**

Fundamentals of Electric Circuits:

DC Circuits: Voltage and current sources (Ideal and Practical), Charge, current, Kirchhoff's laws, circuit elements and their characteristics, Resistance and Ohm's Law, Measuring Devices (Ohm meter, Ammeter, Volt meter). Node voltage analysis, Mesh current analysis, with controlled and uncontrolled sources, superposition, Thevenin's and maximum power transfer Theorem.

AC Circuits: Energy storage elements, time dependent signal sources, solution of circuits containing energy storage elements, phasor solutions of the circuits with sinusoidal excitations, AC circuit analysis. Transient Analysis, Writing differential equations for circuits, Star-Delta Conversion.

**College/Institute Portion (20%)**

DC steady state solutions of circuits, Resonance in series and parallel R-L-C circuit, Time response of second-order circuit OR any related topic as decided by the concerned faculty member teaching the subject.

**Module II (10 Hours)**

**University Portion (80%)**

AC Power: Power in AC circuits, Complex Power, Three-phase power, three phase power measurement by 3 and 2 wattmeter methods, Generation and distribution of AC Power.

Magnetic Circuits and Transformer: Electricity and Magnetism, Magnetic Circuits, Magnetic Materials and B-H curves, Single phase Transformers: Operating principle, emf equation and turns ratio.

Introduction to Machines: DC Machines, AC Machines

**College/Institute Portion (20%)**

Residential Wiring, Grounding and safety, Measurement Systems and Transducers, or any related topic as decided by the concerned faculty member teaching the subject.

**Module III (12 Hours)**

**University Portion (80%)**

Semiconductor Diodes: Intrinsic semiconductors, Doped semiconductors, P-N junction with open circuit, P-N junction with an applied voltage, Ideal Diode, Terminal characteristics of junction diode, modeling the diode forward characteristics, Operation in the reverse breakdown region-Zener Diode, Rectifier circuit, special Diode.

Bipolar Junction Transistors (BJTs): Simplified structure and physical operation of n-p-n and p-n-p transistors in the active region, Current-voltage characteristics of BJT, BJT as an amplifier and as a switch BJT Circuits at DC, Biasing in BJT amplifier circuits, Small Signal Operation of BJT: Simplified hybrid-π model and its application to single stage BJT amplifiers (Common-Emitter, Common-Base and Common-Collector configurations)

**College/Institute Portion (20%)**

The Operational Amplifier (Op-Amp): The ideal Op-Amp, Inverting and non-inverting configurations, Difference amplifier, CMRR, Application of Op-Amp (Instrumentation amplifier, Summing amplifier, Integrator and Differentiator) OR any related topic as decided by the concerned faculty member teaching the subject.

**Module IV (10 Hours)**

**University Portion (80%)**

Digital Electronic Principles: Introduction, Binary digits, Logic levels and Digital waveforms, Introduction to basic Logic operation, Number system, Decimal numbers, Binary numbers, Decimal-to-Binary conversion, Simple binary arithmetic.

Logic Gates, Boolean algebra and Combinational Logic Circuits: The inverter, The AND, OR, NAND NOR, Exclusive-OR and Exclusive-NOR gate, Boolean operations and expressions, Laws and Rules of Boolean algebra, DeMorgan's theorem, Boolean analysis of logic circuits, Standard forms of Boolean expressions, Boolean expression and truth table. Basic combinational logic circuits, Implementation of combinational logic, the universal properties of NAND and NOR gates, Basic adders.

**College/Institute Portion (20%)**

Multiplexers and Demultiplexers. OR any related topic as decided by the concerned faculty member teaching the subject.

**Text Book**

1. Foundations of Electrical Engineering, Leonard S.Bobrow, Oxford University Press, Asian Edition published in 2013.
2. Edward Hughes (revised by Ian McKenzie Smith), "Electrical & Electronics Technology", Pearson Education Limited. Indian Reprint 2002, 10th Edition

**REFERENCE BOOKS**

1. Principles and Applications of Electrical Engg., Rizzoni, McGrawHill.
2. H.Cotton, "Advanced Electrical Technology", CBS Publishers, New Delhi, 7th Edition
3. Electronic Instrumentation, H.S. Kalsi, Tata McGraw-Hill Publishing Company Limited, New Delhi.
4. Microelectronic Circuits (sixth Edition), Adel S. Sedra and Kenneth C. Smith, Oxford University Press,
5. Digital Fundamentals (Eighth Edition), Thomas L. Floyd and R.P. Jain, Pearson Education.
6. Basic Electrical and Electronics Engineering, D P Kothari, I J Nagrath, Mc Graw Hill Education (India) Private Limited, Copyright 2014
7. Basic Electrical and Electronics Engineering, M.S.Sukhija, T.K.Nagsarkar ,Oxford, First published 2012.

# ELECTRICAL & ELECTRONICS ENGG. LABORATORY

**Group-I**

1. Familiarization of electronic components and devices (Testing of semiconductor diodes and transistors using digital multimeter)
2. Study and use of Oscilloscope, signal generator to view waveforms and measure amplitude and frequency of a given waveform.
3. V-I characteristics of semiconductor diode and determining its DC and AC resistance.
4. Studies on half-wave and full-wave rectifier circuits without and with capacitor filter; recording of the waveforms and measurement of average and rms values of the rectifier output.
5. V-I characteristic of an n-p-n or p-n-p transistor, DC biasing the transistor in common-emitter configuration and determination of its operating point (i.e., various voltages and currents).
6. Studies on Logic gates (Truth table verification of various gates).

**Group-II**

1. Study of different electrical equipments.
2. Power factor improvement using capacitor for fluorescent lamp.
3. Verification of Superposition and Thevenin's theorem.
4. Polarity test of transformer.
5. Power measurement using 2-wattmeter method.
6. Calculation of current, voltage and power in series R-L-C circuit excited by single-phase AC supply and calculation of power factor.

# APPLIED MATHEMATICS-II

**Module - I (10 Hours)**

Laplace transformation and its use in getting solution to differential equations, Convolution, Integral
Equations.

**Module - II (12 Hours)**

Fourier series, Fourier expansion of functions of any period, Even and odd functions, Half range
Expansion , Fourier transform and Fourier Integral, Gamma, Beta functions, error function

**Module - III (10 Hours)**

Vector differential calculus: vector and scalar functions and fields, Derivatives, Curves, tangents and arc
Length, gradient, divergence, curl

**Module - IV (13 Hours)**

Vector integral calculus: Line Integrals, Green Theorem, Surface integrals, Gauss theorem and Stokes
Theorem

**Text Book**

1. Advanced Engineering Mathematics by E. Kreyszig, John Willey & Sons Inc. 10th Edition Chapters 6, 9, 10,11

**Reference Books:**

1. Higher Engineering Mathematics by B. V. Ramana , Mc Graw Hill Education
2. Engineering Mathematics by .Pal and s. Bhunia, Oxford Publication
3. Advance Engineering Mathematics by P.V. O'Neil, CENGAGE

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# APPLIED PHYSICS

**Module-I (07 Classes)**

Classical Dynamics

Principle of virtual work, De-Alembert Principle, Action principle, Langrage equation of motion and its application to Simple Harmonic oscillator. Velocity dependent potential**.**

**Oscillation & Waves**

Simple Harmonic Oscillation, damped harmonic oscillation, Forced oscillator, resonance, coupled oscillation, concept of wave and wave equation.

**OPTICS**

Concept of interference, two source interface pattern, Bi-prism, Michelson Interferometer & measurement of wavelength.

Diffraction: Hugen's principle, Fresenel & Frauhoper's diffraction, Zone plate.

**Module-II (07 Classes)**

**Solid State Physics**

Crystalline and amorphous solid, unit cell, Miller Indices, Reciprocal lattice, Bragg's law, Brillouin's zone, concept of fermions, Maxwell-Boltzmann, Fermi-Dirac and Bose-Einstein distribution function (only statement and formula), Concept of Fermions and Bosons. Classification of materials: metals, semiconductor and insulator in terms of band theory

***LASER and Fibre Optics:***

principle and application -stimulated emission, population inversion, Lasing material (solid and gas), He-Ne laser, Rubi- LASER, Application of LASER (Engineering Application), Principle of optical fibre and its application to communication.

**Module-III (08 Classes)**

***Electromagnetism***- Student will be familiarized with some basic used in vector calculus prior to development of Maxwell's electromagnetic wave equations. No proof of theorems and laws included in this unit expected- statement and interpretation should sufficient.

a) Vector calculus: gradient of scalar field, divergence, curl of vector field (Only Physical significance) Gauss divergence theorem, Stoke's theorem, Green's theorem (Only Statements)

b) Gauss's law of electrostatics in free space and in a medium(Only statements)electric displacement( **D)**magnetic Induction (**B**),Amperes circuital law (Only statements), displacement current, Faraday's law of electromagnetic induction(Only statements).

**Module-IV(08 Classes)**

**Quantum Physics*:*** Elementary concepts of quantum physics formulation to deal with physical systems.

a) Need for Quantum physics-Historical overviews, Particle aspects of radiation-Black body radiation, photoelectric effect, Compton scattering, pair production.( No derivations), Wave aspect of particles- matter wave, de Broglie Hypothesis, Heisenberg Uncertainty principles- Statement, Interpretation and example

b) Basic features of Quantum mechanics- Transition from deterministic to probabilistic, States of system- Wave function, probability density, superposition principle, observables and operators, expectation values. Schrodinger equation-Time dependent and time independent, wave packets.

**Text Books:**

1. Principle of Physics Vol. I & Vol. II by Md. M. Khan & S. Panigrahi (Cambridge Univ. Press).

2. Engineering Physics by D.R. Joshi, Mc Graw Hill

3. Engineering Physics by D.K Bhattacharya and Poonam Tandon, Oxford University Press

**Reference Book**:

1. Quantum Mechanics by Powel & Craseman.

2. Optics- A. K. Ghatak

3. Electricity & Magnetism : E.M. Purecell

4. Introduction to Electrodynamics- David J. Griffiths, PHI Publication

5. Concepts of Modern Physics – Arthur Beiser.

6. Engineering Physics- K.P.Mishra and P. Pattojoshi, Scitech Pub.

7. Concepts in Engineering Physics-I Md. N. khan, Alok Publication.

8. Physics-I for engineering degree students-B.B. Swain and P.K.Jena.

9. An Introduction to Machanics by D.Klippner & R. Kolenkow, TMH

# APPLIED PHYSICS LABORATORY

A student is expected to perform ten experiments form the list given below.

1. Determination of Young's modulus by Searle's method.

2. Determination of Rigidity modulus by static method.

3. Determination of surface tension by capillary rise method.

4. Determination of acceleration due to gravity by Bar / Kater's pedulum.

5. Determination of unknown resistance using meter bridge.

6. Determination of wave length of light by Newton's ring apparatus.

7. Determination of grating element of a diffraction grating.

8. Plotting of characteristic curve of a PN junction diode.

9. Plotting of characteristic curves of BJT.

10. Verification of laws of vibration of string using sonometer.

11. Determination of wavelength of laser source by diffraction rating method.

12. Study of Hall Effect.

13. Study of RC circuit.

14. Determination of Young's modulus by bending of beams.

15. Michelson Interferometer.

16. Determine of reduction factor of the given tangent galvanometer and horizontal component of earth's magnetic field by using tangent galvanometer.

# APPLIED CHEMISTRY

**Course Objectives:**

(1) To understand the basics of molecular interactions.
(2) Introductory idea about organometallics and their catalytic applications.
(3) Basics of fuels an corrosion chemistry.

**Module I:**

Quantum Chemistry and Spectroscopy: Basic concepts and postulates of quantum mechanics. Introduction to Schrodinger Wage Equation. Particle in a box: Energy levels, quantum members and selection rule.

Spectroscopy: Lambert Beer's Law, Principles and applications of UV-Visible Molecular Absorption Spectroscopy; Chromophores, applications to colorimetry. Effect of conjugation on chromophores, Absorption by aromatic systems, Introductory idea on Rotational and Vibrational Spectroscopy-Principles and application to diatomic molecules. [7 Classes]

The phase rule: Statement of Gibb's phase rule and explanation of the terms involved, Phase diagram of one component system – water and sulfur system, Condensed phase rule, Phase diagram of two component system – Eutectic Bi-Cd system. [3 Classes]

**Module II:** (10 classes)

Organometallics: Introduction to organometallics, EAN rule; classification, nomenclature and characteristics of organometallic compounds. Applications of organometallic compounds and catalyst in alkene isomerization hydrogenation and hydroformylation (detail mechanisms are to be excluded). [10 Classes]

**Module III:**

Fuels: Classification of fuels, calorific value. (Determination by Dulong's formula), G.C.V. and N.C.V. Liquid fuels: Classification of petroleum, Refining of petroleum, Cracking, Knocking and anti knocking, cetane and octane numbers. Unleaded petrol, synthetic petrol, power alcohol. Gaseous Fuel: Producer gas, Water gas, LPG, CNG, Kerosene gas, Combustion calculation. [10 Classes]

**Modlule-IV** ( 6 classes)

Corrosion: Electrochemical theory of corrosion, galvanic series, Types of corrosion; Differential metal corrosion, Differntial aeration corrosion (Pitting and water line corrosion), Stress corrosion (caustic embrittlement in boilers), Factors affecting, Metal coatings – Galvanizing and Timing, Corrosion inhibitors, cathodic protection.

**Text Books:**


1. Text Book in Applied Chemistry by A. N. Acharya and B. Samantaray, Pearson India.
2. Introductory to Quantum Chemistry by A. K. Chandra. , 4th Edition, Mcgraw Hill Education.
3. Fundamentals of Molecular & Spectroscopy by Banwell, Tata McGraw Hill Education.
4. Physical Chemistry by Gordon M. Barrow, McGraw-Hill
5. Engineering Chemistry, 12th Edition, Author: Wiley India Editorial Team Publishers Wiley.
6. Engineering Chemistry: Fundamentals and Applications. Shikha Agarwal. Cambridge University Press.
7. Engineering Chemistry, Jain and Jain, Dhanpat Rai Publiation.


**Reference Books:**


1. Inorganic Chemistry by Donald A. Tarr, Gary Miessler, Pearson India, Third Edition.
2. Quantum Chemistry by Ira N. Levine, Pearson 7th Edition.
3. Molecular Spectroscopy, Ira N. Levine, John Wiley and Sons
4. Modern Spectroscopy – A Molecular Approach, by Donald McQuarrie and John Simon, published by University Science Books.
5. Inorganic Chemistry by W. Overton, Rounk and Armstrong, Oxford Univesity Press, 6th edition.

# APPLIED CHEMISTRY LAB. (0-0-2)

**B.Tech. (for all branches):**

1. Determination of amount of sodium hydroxide and sodium carbonate in a mixture.
2. Determination of total hardness of water by EDTA method.
3. Estimation of calcium in calcium in limestone.
4. Determination of percentage of available chlorine in a sample of bleaching powder.
5. Preparation of Phenolphthalein.
6. Acid-Base Titration by Potentiometry.
7. Preparation of buffer solution and determination of pH of a buffer solution.
8. Standardization of $KMnO_4$ using sodium oxalate. Determination of ferrous iron in Mohr's salt by potassium permanganate.
9. Determination of partition coefficients of iodine between benzene and water.
10. Determination of rate constant of acid catalyzed hydrolysis reaction.
11. Determination of concentration of a coloured substance by spectrophotometer.
12. Determination of dissolved oxygen in a sample of water.
13. Determination of Viscosity of a lubricating oil by Red Wood viscometer.
14. Determination of Flash point of a given oil by Pensky-Marten's flash point approach.
15. Determination of Critical Micelle concentration (CMC) of an ionic surfactant (Both cationic and anionic).

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# BASIC MECHANICAL ENGINEERING

Theory L/T (Hours per week): 3/0, Credit: 3

**MODULE-1**

**Thermodynamics: (9 classes)**

Systems, Properties, Process, State, Cycle, Internal energy, Enthalpy, Zeroth Law, First law and Second Law of Thermodynamics, Basic Concept of Entropy, Properties of ideal gas., Properties of pure substances, Steam formation, Types of Steam, Enthalpy, Specific volume, Internal energy and dryness fraction of steam, use of Steam tables. Related numericals.

**MODULE-2**: **( 11 classes)**

**Application of Thermodynamics:**

Air compressors, Steam Power Plant, Refrigerators and Heat pump, I.C. Engines (Brief Description of different components of above mentioned systems and working principles with Schematic diagram only)

**Introduction to Fluid Mechanics and Heat transfer:**

Fluid properties, Pascal's law, Buoyancy, Bernoulli's theorem, pipe flow, hydraulic turbines and pumps. Different modes of heat transfer, heat exchangers (basics).

**MODULE-3(8 classes)**

**Production processes**

Turning , Casting, Welding and forming (Drawing, Forging, Extrusion) (working principles with Schematic diagram only)

**Engineering materials:**

Classification of Engineering materials. Mechanical properties of Steel, Aluminum and Plastics.

**MODULE-4 (8 classes)**

**Fasteners and Power transmission devices:**

Nut, Bolt, Screw, Rivets, Belt, Rope, Gear drives. Coupling, clutch, brakes. (Basics, applications, advantages and limitations only).

**Mechanical Measurements:**

Temperature, pressure, velocity, flow, strain, force, torque measurements. (Working principle only).

**Text books**


1. Basic Mechanical Engineering by Pravin Kumar, Pearson
2. Basic Mechanical Engineering by A R Israni, P K Shah, BS Publications
3. Text book of Elements of Mechanical Engineering, S T Murthy, Universities press


**Reference books**


1. Basic Mechanical Engineering by .D. Mishra, P.K Parida, S.S.Sahoo, India Tech Publishing company
2. Basic and applied Thermodynamics by P. K. Nag, Tata Mc Graw Hill
3. Elements of Mechanical Engineering by J K Kittur and G D Gokak, Willey
4. Basic Mechanical Engineering by Basant Agrawal, C M Agrawal, Willey
5. Engineering Thermodynamics by P. Chattopadhaya, Oxford University Press

# BASIC MECHANICAL ENGINEERING PRACTICAL

## (HOURS PER WEEK): 2, CREDIT: 1

(Minimum 8 experiments/studies)

1. Determination of equilibrium of coplanar forces.
2. Determination of Moment of Inertia of Flywheel
3. Model study of Fire Tube Boilers
4. Model study of Water Tube Boilers
5. Model study of Two stroke I.C. Engine
6. Model study of Four stroke I.C. Engine
7. Model study of Refrigerator
8. Model study of Automobile Parts
9. Model study of Water Turbines
10. Model study of Water pumps
11. Model study of Heat Exchanger.
12. Determination of velocity ratio of belt drive
13. Study of Gears and Gear trains
14. Study of Mechanical fasteners
15. Verification of Bernoulli's Theorem and its application to Venturimeter.
16. Calibration of Bourdon Tube Pressure gauge and measurement of pressure using manometers

# BASICS OF CIVIL ENGINEERING (3-0-1)

**MODULE-I (10 classes)**

**Mechanics:**Concurrent forces on a plane – Composition and resolution of forces and equilibrium of concurrent coplanar forces, Method of projections, Methods of moment, Friction.Parallel forces in a plane- Two parallel forces, General case of parallel forces, Center of parallel forces in a plane and center of gravity- centroids of composite plane figure and curves, Distributed parallel forces in a plane. General case of forces in a plane- composition of forces in a plane and equilibrium of forces in a plane.

**Module-II (10 classes)**

**Plane trusses-** method of joints and method of sections. Moments of Inertia- Plane figure with respect to an axis in its plane and perpendicular to the plane- parallel axis theorem, Moment of Inertia of material bodies.

Rectilinear Translation- Kinematics- Principles of Dynamics- D'Alemberts Principles, Momentum and impulse, Work and Energy- impact

**Module-III (8 classes)**

**Building Material and Building Construction**: Bricks: Brick as a construction material and its importance, qualities of a good brick,Stone: classification, composition and characteristics, Cement: Classification, tests for cement, uses of cement, types of cement, Concrete: Quality of mixing water, Workability, vibration of concrete, concrete mix design, Grade and strength of Concrete. Building Components and their basic requirements, Foundation: Types of foundation, spread foundations, pile foundations, Mortar, Stone masonry, brick masonry, roof, floors, building services: air conditioning, fire protection, ventilation.

**Module-IV (8 classes)**

**Surveying:** Linear measurement and chain survey: Use of chains and tapes for measurement of correct length of lines, direct and indirect ranging,Compass surveying: Use of prismatic compass, bearing of a line. Local attraction, Introduction to modern surveying instruments EDM and Total Station.

**Transport, Traffic and Urban Engineering:** Introduction to planning and design aspects of transportation engineering, different modes of transport, highway engineering, rail engineering, airport engineering, traffic engineering, urban engineering

**TEXT BOOKS**

1. Engineering Mechanics by S Timoshenko, D.H Young and J.V.Rao, McGraw Hill
2. Basic Civil Engineering, S. Gopi, Pearson
3. Building Construction, Sushil Kumar, Standard Publishers Distributors
4. Surveying and Levelling by R. Subramanian, Oxford University Press

**REFERENCE BOOKS**

1. Engineering Mechanics by K.L.Kumar, McGraw Hill
2. Engineering Materials, S.C. Rangwala, Charotar Publishing House
3. Building Material and Construction, G C Sahu, Joygopal Jena, McGrow Hill
4. Surveying Vol-1 by R Agor, Khanna Publishers
5. Basic Civil Engineering, M.S. Palanichamy, McGraw Hill

# BASICS OF CIVIL ENGINEERING LAB

1. Polygon Law of Coplanar Forces
2. Support Reactions of a beam
3. Experiment on trusses to calculate the force in the member of a simple truss
4. Friction experiment on inclined plane for determining coefficient of friction
5. Moment of inertia of fly wheel
6. Shape and size test of brick
7. Compressive strength of brick
8. Testing of chain and measurement of correct length of the line
9. Bearing of a line
10. Study of Total Station

# ENVIRONMENTAL STUDIES AND HEALTH CARE ENGINEERING (3-0-0)

Objective: This course introduces the environmental consequences of Industries on the human health and methods for minimizing their impact through technology and legal system to the undergraduate engineering students.

**Module-I [8 Periods]**

Ecological concept, Ecosystem processes like energy flow, food chain, food web. Water cycle, oxygen cycle and nitrogen cycle. Environmental gradients and tolerance level of environment factors. Basics of Indian Environmental laws, Atmospheric chemistry and temperature profile. Soil pollution and its remedies, Origin and procedure of EIA.

**Module-II [8 Periods]**

Causes, effects and control of air, noise and water pollution, treatment of surface water and waste water (pre-, primary and secondary). DO, BOD and COD of waste water treatment process. Sources, properties and management of solid wastes and hazardous wastes. [6 Periods]

**Module-III [6 Periods]**

Occupational health and safety act and procedure. Hazard control measures in industries like steel, petroleum and pharmaceutical. First aid treatments.

**Module-IV [8 Periods]**

Environment and Human health:-

Occupational health – nutrition, control of communicable diseases, environmental sanitation, mental health. Prevention of occupational diseases through medical measures, engineering measures and legislation. Role of information technology in human health, causes, prevention and control of diseases like hepatitis, typhoid and malaria.

**Text Book:**

1. Environmental Studies by Dash & Kumar, India Tech Publication, New Delhi
2. Environmental Engineering and Safety by Mohapatra, Seven Seas Publication, Cuttack
3. Environmental Engineering & Safety by Dash and Panda, India Tech Publication, New Delhi.
4. Environmental Studies by R.Rajagopalan Oxford University Press

**Reference:**

1. Essentials of Community Health Nursing. By K. Park, M/s. Banarsidas Bhanot, Jabalpur
2. Environmental Studies by Dr. S. K. Dhameja, Kataria and Sons, New Delhi
3. Enviromental Engineering, G. Kiely, McGRaw Hill International Edition, New Delhi
4. Environmental Studies by Bharucha, University Press, Hyderabad.
5.

# PROFESSIONAL ETHICS

**MODULE-I**

Introduction to Ethics: 1.1 Basic terms- Moral, Ethics, Ethical dilemma, Emotional intelligence 1.2 Moral development theories of Kohlberg and Piaget 1.3 View on ethics by Aristotle 1.4 Governing factors of an individual's value system 1.5 Personal and professional ethics

**MODULE-II**

Profession and Professionalism: 2.1 Clarification of the concepts: Profession, Professional, Professionalism, Professional accountability, Professional risks, Profession and Craftsmanship, Conflict of interest 2.2 Distinguishing features of a professional 2.3 Role and responsibilities of professionals 2.4 Professionals' duties towards the organization and vice-a-versa 3 Ethical Theories: 3.1 Various ethical theories and their application- Consequentialism, Deontology, Virtue theory, Rights Theory, Casuist theory 3.2 Ethical terms: Moral absolutism, Moral Relativism, Moral Pluralism etc. 3.3 Resolving Ethical Dilemma

**MODULE-III**

Ethics in Engineering: 4.1 Purpose and concept of Engineering Ethics 4.2 Engineering as social experimentation 4.3 Types of inquiry 4.4 Issues in engineering ethics 5 Engineers' Responsibility and Safety: 5.1 Safety, Risk, Underestimating the risk, Over estimating the risk, Risk-benefit analysis 5.2 Causes of an accident and identification of the preventive measures to be taken 5.3 Case Studies

**MODULE-IV**

Global Ethical Issues: 6.1 Different ethical issues in business, environment, IT, Bioethics, Intellectual Property Rights (IPR), Research, Media, CSR etc. 7 Ethical Codes: 7.1 Meaning and the significance of ethical codes 7.2 The limitations of ethical codes.

**RECOMMENDED BOOKS FOR REFERENCE:**

1. R. Subramanian, "Professional Ethics" , Oxford University Press, New Delhi, 2013
2. Mike W. Martin and Roland Schinzinger, "Ethics in Engineering", Tata McGraw Hill, New Delhi, 2013
3. Charles E Harris, Michael S Pritchard and Michael J Rabins, "Engineering Ethics – Concepts and Cases", Thompson Learning, 2003.
4. Daniel Albuquerque, "Business Ethics", Oxford University Press, New Delhi, 2013
5. Edmund G. Seebauer and Robert L. Barry, "Fundamentals of Ethics", Oxford University Press, New Delhi, 2012.

# ENGINEERING GRAPHICS

**Introduction** Drawing Instruments and their uses, BIS conventions, Lettering, Dimensioning line Conventions

**AUTO CAD**, layout of the software, standard tool bar/menus and description of most commonly used toolbars, navigational tools. Co-ordinate system and reference planes.Definitions of HP, VP, RPP & LPP.Creation of 2D/3D environment.Selection of drawing size and scale. Commands and creation of Lines,Co-ordinate points, axes, poly-lines, square, rectangle, polygons, splines, circles, ellipse, text, move,copy, off-set, mirror, rotate, trim, extend, break, chamfer, fillet, curves, constraints. **2 – Sheets**

**Orthographic Projections**
Introduction, Definitions - Planes of projection, reference line and conventions employed, Projections ofpoints in all the four quadrants, Projections of straight lines (located in First quadrant/first angle only),True and apparent lengths, True and apparent inclinations to reference planes **2 – Sheets**

**Orthographic Projections of Plane Surfaces (First Angle Projection Only)**
Introduction, Definitions–projections of plane surfaces–triangle, square, rectangle, rhombus, pentagon,hexagon and circle, planes in different positions by change of position method only
**1-Sheet**

**Projections of Solids (First Angle Projection Only)**
Introduction, Definitions – Projections of right regular tetrahedron, hexahedron (cube), prisms, pyramids,cylinders and cones in different positions. **2-Sheets**

**Sections and Development of Lateral Surfaces of Solids**
Introduction, Section planes, Sections, Section views, Sectional views, Apparent shapes and True shapesof Sections of right regular prisms, pyramids, cylinders and cones resting with base on HP.
**2 – Sheet**

**Isometric Projection (Using Isometric Scale Only)**
Introduction, Isometric scale, Isometric projection of simple plane figures, Isometric projection of tetrahedron, hexahedron(cube), right regular prisms, pyramids, cylinders, cones, spheres, cutspheres.
**2-Sheets**

**Text Books**

1. Engineering Drawing - N.D. Bhatt & V.M. Panchal, Charotar PublishingHouse, Gujarat.
2. Computer Aided Engineering Drawing - S. Trymbaka Murthy, -I.K. International PublishingHouse Pvt. Ltd., New Delhi
3. Engineering Drawing by N.S.Parthasarathy and Vela Murali Oxford University Press

**Reference Books**

1. Engineering Graphics - K.R. Gopalakrishna, Subash PublishersBangalore.
2. Fundamentals of Engineering Drawing with an Introduction to Interactive Computer Graphicsfor Design and Production-Luzadder Warren J., Duff John M., Eastern Economy Edition,Prentice-Hall of India Pvt. Ltd., New Delhi.
3. Computer Aided Engineering drawing, Prof. M. H. Annaiah, New AgeInternational Publisher, New Delhi

# ENGINEERING WORKSHOP

**Fitting Practice:**

Use of hand tools in fitting, preparing a male and female joint of M.S. or making a paper weight of M.S.

**Welding Practice** :

Gas welding & Electric Arc welding Practice.

A joint such as a Lap joint, a T-joint or a Butt joint is to be prepared or to make furniture.

**Machining:**

(i) Stepped cylindrical Turning of a job and Thread-cutting in lathe.

(ii) Shaping (iii) Milling

**Reference**

1. Elements of Workshop Technology, Vol. I and II by Hajra choudhary, Khanna Publishers

2. Workshop Technology by WAJ Chapman, Viva Books

3. Workshop Manual by Kannaiah/ Narayana, Scitech

# COMPUTER LAB
# will be uploaded soon