

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. FIRST YEAR SYLLABUS

GROUP 1

ENGINEERING BRANCHES

Electronics and Communication Engineering

Mechanical Engineering

Civil Engineering

Name: _____

Branch: _____

ID. No.: _____

Group 1 - Semester I

Sr. No.	Subjects	Subject Code	Teaching Scheme			
			Theory	Tutorial	Practical	Credits
1	Mathematics I	101	3	2	0	5
2	Physics	102	3	0	2	5
3	Mechanics of Solids	103	3	0	2	5
4	Computer Programming and Utilisation	105	3	0	4	7
5	Elements of Mechanical Engineering	204	4	0	2	6
6	Workshop	206	0	0	4	4
TOTAL			16	2	14	32

Group 1 - Semester II

Sr. No.	Subjects	Subject Code	Teaching Scheme			
			Theory	Tutorial	Practical	Credits
1	Mathematics II	201	3	2	0	5
2	Elements of Civil Engineering	202	4	0	2	6
3	Elements of Electrical Engineering	203	4	0	2	6
4	Engineering Graphics	104	2	0	4	6
5	Environmental Studies	205	3	0	0	3
6	Communication skills	106	1	0	2	3
TOTAL			17	2	10	29

Academic Calendar for Semester – I

- Academic Term: 28/07/2008 to 25/10/2008
10/11/2008 to 22/11/2008
- Diwali Vacation: 26/10/2008 to 9/11/2008
- Mid Semester Exam: 22/9/2008 to 29/9/2008
- End Semester Exam: 15th December onwards.

Semester – I - Mathematics-I

- Review of limits, continuity, and differentiability.
- Mean value theorem, Taylors Theorem, Maxima and Minima.
- Riemann integrals, Fundamental theorem of Calculus, Improper integrals, applications to area, volume.
- Convergence of sequences and series, power series.
- Partial Derivatives, gradient and directional derivatives, chain rule, maxima and minima, Lagrange multipliers.
- Double and Triple integration, Jacobians and change of variables formula.
- Parametrization of curves and surfaces, vector Fields, line and surface integrals.
- Divergence and curl, Theorems of Green, Gauss, and Stokes.

Texts/References

1. Hughes-Hallett et al., Calculus - Single and Multivariable (3rd Edition), John-Wiley and Sons (2003).
2. James Stewart, Calculus (5th Edition), Thomson (2003).
3. T. M. Apostol, Calculus, Volumes 1 and 2 (2nd Edition), Wiley Eastern 1980.
4. G. B. Thomas and R. L. Finney, Calculus and Analytic Geometry.

Semester – I - Physics

1) Architectural Acoustics: Classification of Sound: Loudness – Weber – Fechner law Decibel – Absorption Coefficient – Reverberation – Sabine's formula – Factors affecting acoustics of buildings and their remedies.

2) Ultrasonic: Introduction, production, properties and detection of ultrasonics, Determination of velocity and application of ultrasonic in Engineering.

3) Crystal Physics: Introduction and classification of solids-crystal structure – The crystal systems and Bravais Lattice – Space Lattices of cubic systems – Miller Indices – Relation between Interplanar Distance and cubic Edge and Laws Formula.

4) Band theory of Solids: Band theory of Solids – Classification of solids – Energy band structure of conductors, insulator and semi conductors types of diodes, simple diode, Zener diode, varactor diode, LED Solar cells, photovoltaic cell, Photo Conductivity, Hall effects.

5) LASERS: Introduction and properties of Lasers, Stimulated and spontaneous emission – Relation between Einstein's 'A' and 'B' Coefficients-Population Inversion – Optical – Pumping – Nd-Yag Laser and CO₂ Laser – Application of Laser in Material Processing – Holography – Application of Lasers

6) Optical – Fibre Communication: Introduction – Fibre – Optic System – advantages of Fibre optics – Basic principle – Acceptance angle and Numerical Aperture – Types of optics preparation through optical fibre

7) Conducting Materials: Introduction – conduction in Metals, Electron theory Q.M. treatment – Free electron theory of metals – Electrical Conductivity – Thermal Conductivity – Wildemann – Franz law – Drawbacks of classical free electron theory.

8) Super Conducting Materials: Introduction to super conductor – properties of super conductor Type I and Type II super conductor – Comparison between I and II – High T conductors – Application

9) New Engineering Materials: Introduction – Metallic glasses, types, properties, preparation and its application – Introduction to nano technology – method of producing, properties and its application – shape memory alloys – types – shape Memory effect – Pseudo elasticity – properties – application – Bio-materials – General information – Biomedical compatibility of Ti-Al-Nb alloys for implant application.

10) Non-Destructive Testing: Introduction – The objective of NDT – Types of Defects – Methods of NDT (Liquid Penetrate – Dye Penetrate Radiographic) x X-ray Radiography – X-ray Fluoroscopy – Ultrasonic Inspection method – Pulse Echo System – Visual Display units.

Reference Books:

- 1) Engineering Physics K. Rajagopal Prentice-Hall of India Pvt. Ltd., New Delhi
- 2) Engg. Physics G. Vijayakumari Vikas Publishing House Pvt. Ltd.
- 3) A Text book of Engg. Physics M.N. Aavadhulala S. Chand P .G. Kshirsagar
- 4) Engg. Physics Abhijit Nayak S.K. Kataria & Sons. Delhi.

Semester – I - Mechanics of Solids

1. Introduction: Scalar and Vector Quantities, composition and resolution of vectors, system of units, definition of space, time, particle, rigid body, force.

2. Fundamentals of Statics: Principles of statics, coplanar, concurrent and non-concurrent, parallel and non-parallel forces, composition and resolution of forces, moments & couples - their properties, combination of coplanar couples and forces, equilibrant, equilibrium, free body diagrams, analytical conditions of equilibrium for coplanar force systems.

3. Truss: Simple determinate plane trusses and analysis for member forces using methods of joints and methods of sections.

4. Distributed forces, center of gravity and moment of inertia: Center of gravity of lines, plane areas, volumes and bodies, Pappus – Guldinus theorems, moment of inertia, polar moment of inertia & radius of gyration of areas, parallel & perpendicular axes theorems.

5. Friction: Theory of friction, static and sliding friction, laws of friction, angle and coefficient of friction, inclined plane friction, ladder friction, wedges, belt and rope friction.

6. Simple Machines: Velocity ratio, mechanical advantage, efficiency, reversibility of machines, simple machines such as levers, pulley and pulley blocks, wheel and differential axle, Single purchase/double purchase crab, compound screw jacks.

7. Physical & Mechanical properties of structural materials: Properties related to axial, bending, and torsional & shear loading, Toughness, hardness, proof stress, factor of safety, working stress, load factor.

8. Simple stresses & strains: Elastic, homogeneous, isotropic materials; limits of elasticity and proportionality, yield limit, ultimate strength, strain hardening, section of composite materials, prismatic and non-prismatic sections.

Strains: Linear, shear, lateral, thermal and volumetric, Poisson's ratio. Stresses: Normal stresses, axial – tensile & compressive, shear and complementary shear, thermal and hoop,. Applications to composite material stepped & tapered bars.

9. Beam:

(a) Types of loads, Types of supports, Types of beams, Support reactions for statically determinate beams
(b) Bending moment and Shear force , Bending moment and shear force diagrams for statically determinate beams subjected to couples, concentrated forces, uniformly distributed loadings, relation between bending moment, shear force and rate of loading, point of contraflexure.

10. Stresses in beams: Theory of simple bending, bending stresses and their distribution, moment of resistance, modulus of sections, distribution of shear stresses in different sections.

11. Principal stresses and strains: Compound stresses, analysis of principal planes and principal stresses, principal strains, angle of obliquity of resultant stress, principal stresses in beams.

BOOKS:

1. Engineering Mechanics (Statics) Beer and Johnston
2. Applied Mechanics S. B. Junnarkar & H. J. Shah
3. Mechanics of Structure Vol. I S. B. Junnarkar & H. J. Shah
4. Mechanics of Materials Beer and Johnston.

Semester – I - Computer Programming and Utilization

1 Introduction to Computer & Programming: Introduction, Basic block Diagram and functions of various components of computer. Concept of Hardware and Software. Concept of basic types of software. Introduction to programming and programming languages. Flow charts and algorithms.

2 Introduction to C Language:

I Fundamentals of 'C': Data types in 'C'. Operators and their hierarchy, Concept of header files, I/O functions, control structures in C, looping structures in C, arrays and strings.

II Functions and recursion: Concepts of functions with various types of parameters. Various types of parameter passing mechanisms. Recursive functions and implementation of these concepts in 'C'.

III Pointers and structures: Concepts of pointers and simple programs using pointers. Introduction to simple structure and its implementations.

3 Introduction to C++ language

I Principles of object oriented programming, Comparison with procedural languages, Tokens, expressions and control structures

II Introduction to functions, classes, objects, constructors, destructors in C++. Classes and Objects: Declaring classes, defining member functions, Making an outside function inline, nesting of member functions, private member functions, Arrays with in a class, Memory allocation of objects, static data members, static member functions, arrays of objects, objects as function arguments, friend function, returning of objects, const member function.

Text books:

1. Title : Programming in ANSI C, 4th edition Author: Balagurusamy E Publisher: Tata McGraw-Hill Publishing Company limited
2. Object oriented programming with C++, 3rd edition Author: Balagurusamy E Publisher: Tata McGraw-Hill Publishing Company limited

Semester – I - Elements of Mechanical Engineering

I Introduction: Prime movers, Sources of energy, Types of prime movers, Force and mass, Pressure, Work, Power, Energy, Heat, Temperature, Units of heat, Specific heat capacity, Interchange of heat, Change of state, Mechanical equivalent of heat, Internal energy, Enthalpy, Entropy, Efficiency, Statements of Zeroth Law, First law and Second Law of Thermodynamics.

II Fuels and Combustion: Introduction, Classification, Solid fuels, Liquid Fuels, Gaseous fuels, LPG, CNG and biofuels, Calorific values.

III Properties of gases : Gas laws, Boyle's law, Charles's law, Combined gas law, Gas constant, Internal energy, Relation between C_p and C_v , Enthalpy, Non flow process, Constant volume process, Constant pressure process, Isothermal process, Poly-tropic process, Adiabatic process.

IV Properties of Steam: Introduction, Steam formation, Types of Steam, Enthalpy, Specific volume of steam and dryness fraction of steam, Internal energy, Steam tables, Non-flow process. Measurement of dryness fraction, Throttling calorimeter, Separating calorimeter, Combined calorimeter.

V Heat Engines : Thermal prime movers, Elementary heat engines, Sources of heat, Working substances, Converting machines, Classification of heat engines, Heat engine cycles, Carnot cycle, Rankine cycle, Otto cycle, Diesel cycle.

VI Steam Boilers : Introduction, Classification, Simple vertical boiler, Vertical multitubular boiler, Cochran type, Lancashire boiler, Locomotive boiler, Babcock and Wilcox boiler, High pressure boilers, Boiler details, Boiler performance. Functioning of different mountings and accessories.

VII Internal Combustion Engines : Introduction, Classification, Engine details, Otto four-stroke cycle, Diesel-four-stroke cycle, Difference between Otto cycle and Diesel cycle, Two-stroke cycle, Difference between two-stroke and four-stroke cycle, indicated power (ip), Brake Power (bp), Efficiencies.

VIII Speed Control: Introduction, Governors, I.C. Engine governing, Fly wheel.

IX Pumps : Introduction, Reciprocating pump, types and operation, Bucket pump, Air Chamber, Centrifugal pumps, Types and Priming, Rotary pumps.

X Air Compressors: Introduction, Uses of Compressed air, Reciprocating compressors, Operation of a compressor, Work for compression, Power required, Reciprocating compressor efficiency, Multistage reciprocating compressors, Rotary compressors.

XI Refrigeration & Air Conditioning: Introduction, Refrigerant, Types of refrigerators, Vapour compression refrigerating system, Window and split air conditioners.

XII Couplings, Clutches and Brakes: Introduction, Couplings, Clutches, Brakes, Types of brakes. Difference between a brake and a clutch.

XIII Transmission of Motion and Power: Introduction, Methods of drive, Power transmission elements, shaft and axle, Belt-drive, Pulleys, Power transmitted by a belt, Chain drive, Friction drive, Gear drive

XIV Important Engineering Materials: Properties of materials, Ferrous & Nonferrous materials and other important engineering materials such as Timber, Abrasive material, silica, ceramics, glass, graphite, diamond, plastic, polymer and composite material

Reference Books:

I Elements of Mechanical Engineering by K.P.Roy and Prof.S.K. Hajra Chaudhary, Media Promoters and Publishers Pvt.Ltd. Bombay

II Introduction to Engineering Materials by B.K. Agrawal Tata Mcgrahill Publication New Delhi

III Thermal Science and Engineering by Dr. D.S. Kumar, S.K. Kataria & sons Publication New Delhi

IV Fundamental of Mechanical Engineering by G.S. Sawhney, Prentice Hall of India Publication New Delhi

V Thermal Engineering by R.K. Rajput, S.Chand Publication New Delhi

Semester – I - Workshop

Objectives: Exposure to Industrial environment, work culture, hand tools and general purpose machine.
Developing Creativity, Craft man skill, approach to work and Planning capability

Syllabus:

Demonstration of Hand tools, Power tools, Machine tools, Processes, Materials, Marking, and Measurement in following shops: Carpentry, Pattern making, Foundry, Fitting, Smithy, Welding, Tin smithy, Plumbing, Machine shop and Electroplating.

Making Jobs in Fitting, Carpentry, Smithy, Tin smithy and Welding shops

Journal is to be prepared covering the topics of demonstration and Report about Process / Methodology / Inspection for making jobs.

Text Books & Reference Books:

1. Choudhary, Hajara “Elements of Workshop Technology”, Media Promoters & Publishers, 1997
2. Raghuvanshi B.S. “Workshop Technology” Vol. I & II, Dhanpat Rai & Sons 1998
3. Chapman W.A. J and Arnold E. “Workshop Technology” Viva low priced Student edition, 1998

Semester – II - Mathematics-II

- Vectors in R^n , notion of linear independence and dependence, linear span of a set of vectors, vector subspaces of R^n , basis of a vector subspace.
- Systems of linear equations, matrices and Gauss elimination, row space, null space, and column space, rank of a matrix.
- Determinants and rank of a matrix in terms of determinants.
- Abstract vector spaces, linear transformations, matrix of a linear transformation, change of basis and similarity, rank-nullity theorem.
- Inner product spaces, Gram-Schmidt process, orthonormal bases, projections and least squares approximation.
- Eigenvalues and eigenvectors, characteristic polynomials, eigenvalues of special matrices (orthogonal, unitary, hermitian, symmetric, skewsymmetric, normal). algebraic and geometric multiplicity, diagonalization by similarity transformations, spectral theorem for real symmetric matrices, application to quadratic forms.

Texts/References

1. H. Anton, Elementary linear algebra with applications (8th Edition), John Wiley (1995).
2. G. Strang, Linear algebra and its applications (4th Edition), Thomson(2006).
3. S. Kumaresan, Linear algebra - A Geometric approach, Prentice Hall of India (2000).
4. E. Kreyszig, Advanced engineering mathematics (8th Edition), John Wiley (1999).

Semester – II - Elements of Civil Engineering

I Scope of Civil Engineering

Introduction: Impact of Infrastructural Development on the Economy of a Country, Role of Civil Engineers, Importance of Planning, Scheduling and Construction Management.

II Surveying

Introduction: Surveying and levelling, Object and uses, Primary divisions, Fundamental principles, Classification of surveying, Plans and maps, Scales, Units of measure.

Linear measurements: Methods, Instruments used in chaining; Chain surveying, Ranging; Obstacles; Errors in chaining, Tape corrections, Conventional symbols

Compass surveying: Types and uses of compass, Bearings, Whole Circle Bearings, and Reduced Bearings, Computation of angles; Meridians; declinations and dip of needle; Local attraction; Chain and compass surveying field work.

Elevation measurements: Levelling, object and uses, terms used in levelling, leveling instruments, methods of levelling, recording and methods of reducing, errors in levelling, contours; characteristics and applications.

Areas and volumes; use of a Planimeter.

Modern Tools of Surveying and Mapping: Introduction to Theodolite, Electronic Distance Measurement Instruments, Total Station, Global Positioning System, Remote Sensing and Geographic Information System.

III Construction Materials

Requirement, types, uses, properties and importance of Civil Engineering materials like Stone, Bricks, Lime, Cement, Ferrous and Non Ferrous Metals, Ceramic Materials, Timber, Sand, Aggregate, Mortar and Concrete, Paints and Varnishes, Glass, Plastic, Conducting, Magnetic, and Miscellaneous Materials.

IV Elements of Building Construction

Planning: Elementary principles and basic requirements of a building planning, layout of residential & industrial buildings.

Construction: Classification of buildings based upon occupancy and structure, Design Loads, Common building components, their functions, and nominal dimensions. Elements of building drawing. Introduction to building byelaws.

V Water Resources Development

Elementary Hydrology, Sources of water, Watershed Development, water requirements and its conservation, Hydraulic Structures of Storage, Water Conveyance System: Canals; Water Conduits.

VI Transportation Engineering

Role of Transportation in National development, Transportation Ways, Surface Transportation and Aviation, Elements of Highway materials properties and highway construction, BOT Projects for Highways, Elements of Traffic Engineering and Traffic Control.

Reference Books:

- 1) Title :Surveying Vol .I & II Author: Dr. B. C. Punamia Publisher : Laxmi Publication Delhi
- 2) Title :Surveying Vol. I and II Author : S. K. Duggal Publisher : Tata Macgraw hill Publication New Delhi
- 3) Title: Civil Engg. Drawing Author : S. C. Rangwala Publisher: Charotar Pub. House Anand
- 4) Title : Building Construction Author : Dr. B. C. Punamia Publisher: Laxmi Pub. Delhi
- 5) Title : Engineering Material Author : Dr. S.C. Rangwala Publisher: Charotar Pub. House
- 6) Title : Building Materials Author: Dr. S. .K. Duggal Publisher : New Age International Pub.House Delhi
- 7) Title : Civil Engineering Material Author : Jakson and Dhir Publisher : ELBS Publishing London
- 8) Title : Civil Engineering Material Author : Jakson and Dhir Publisher : ELBS Publishing London
- 9) Title : Highway Engineering Author: Khanna S. K. and Justo C. E.G. Publisher : Nemchand and Brothers
- 10) Title : Irrigation Engineering and Hydraulic Structures Author : Santoshkumar Garg Publisher : Khanna Publishers Delhi

Semester – II - Elements of Electrical Engineering

I D.C. Circuits:- Effect Of Temperature Upon Resistance, Solutions Of series, parallel in brief, star-delta combination of Resistances, KVL & KCL.

II Electrostatics & Capacitance:- Definitions of Electrostatic, types of capacitors, series, parallel combinations & related circuit calculations in brief charging & discharging of capacitor. Energy stored in capacitor.

III Electromagnetics:- Magnetic Circuit , Comparison Between Electric And Magnetic Circuits , Series/Parallel Magnetic Circuit Calculations , Magnetic Hysteresis, Hysteresis And Eddy Current Loss, Magnetic Materials, Electromagnetic induction, Statically And Dynamically Induced E.M.F.S in brief, Fleming's Right hand rule-Left hand rule, Coefficients Of Self And Mutual Inductances , Coefficient Of Coupling, Series/Parallel Combinations Of Inductances, Rise And Decay Of Current In Inductive Circuits , Force Experienced By Current Carrying Conductor Placed In Magnetic Field.

IV Single Phase A.C. Circuits:- Generation Of Alternating Voltages & Currents, Their Equations, Definitions , R.M.S. And Average Values , Vector Representation Of Alternating Quantities , Addition And Subtraction Of Vectors , Complex Algebra., Phasor Relations Between Voltage And Current In Each Of Resistance, Inductance And Capacitance , A.C. Series And Parallel Circuits , Power And Power Factor , Methods Of Circuit Solution (Analytically & Vectorially), Resonance In Series And Parallel Circuits.

V Polyphase Circuits:- Generation Of Polyphase Voltages , 3,Phase System , Phase Sequence, Inter Connection Of 3 Phases , Voltage, Current And Power Relationships In Balanced Three Phase Circuits , Power Measurement In Single Phase And 3 Phase Circuits.

VI Batteries, Cables:- Battery, life of batteries, charging & discharging of battery. Cables, 2, 2 1/2, 3 and 4 core armored & unarmored cables.

VII Electrical Wiring:- Connectors & switches, system of wiring, domestic wiring installation, sub circuits in domestic wiring, simple control circuit in domestic installation, industrial electrification.

VIII Illumination:- Types of lamps, fixtures & reflectors, illumination schemes for domestic, industrial & commercial premises, Lumen requirements for different categories.

IX Safety & protection:- Safety, electric shock, first aid for electric shock other hazards of electrical laboratories & safety rules, use of multimeters, grounding, importance of grounding, equipment of grounding for safety. Circuit protection devices, fuses, MCB, ELCB & relays.

Reference Books:

I Electrical Technology Vol.1 By B.L.Theraja

II Basic Electrical Engineering By V.N.Mittal

III Electrical Estimating & costing by Surjitsingh (Dhanpat Rai & Co.)

Semester – II - Engineering Graphics

- 1. Introduction to Engineering Graphics**, Drawing instruments and accessories, BIS – SP 46. Use of plane scales and Representative Fraction.
- 2. Engineering Curves:** Classification of Engineering Curves, Construction of Conics, Cycloidal Curves, Involute and Spirals.
- 3. Loci of Points:** Path of the points moving on simple arrangements and simple mechanisms, slider crank mechanism, four bar chain mechanism etc.
- 4. Projections of Points & Lines:** Introduction to principal planes of projections, Projections of the points located in same quadrant and different quadrants, Projections of line with its inclination to one reference plane and with two reference planes. True length of the line and its inclination with the reference planes.
- 5. Projections of Planes:** Concept of different planes, Projections of planes with its inclination to one reference plane and with two reference planes. Concept of auxiliary plane method for projections of the plane.
- 6. Projections of Solids & Section of Solids:** Classification of solids. Projections of solids like Cylinder, Cone, Pyramid and Prism with its inclination to one reference plane and with two reference planes. Section of such solids and the true shape of the section.
- 7. Development of Lateral Surfaces:** Concept of development of the different surfaces. Parallel Line Development and Radial Line Development.
- 8. Orthographic Projections:** Principle of projection, Principal planes of projection, Projections from the pictorial view of the object on the principal planes for View from Front, View from Top and View from Side using first angle projection method and third angle projection method, Full Sectional View.
- 9. Isometric Projections and Isometric View or Drawing:** Isometric Scale, Conversion of orthographic views into isometric projection, isometric view or drawing.

NOTE: Topic No. 1, 8 and 9 of the above syllabus to be covered in Practical Hours.

Text Books:

1. A Text Book of Engineering Graphics By P.J.Shah S.Chand & Company Ltd., New Delhi
2. A Text Book of Machine Drawing By P.J.Shah S.Chand & Company Ltd., New Delhi
3. Elementary Engineering Drawing By N.D.Bhatt Charotar Publishing House, Anand
4. Geometrical and Machine Drawing By N.D.Bhatt Charotar Publishing House, Anand

Reference Books:

1. Engineering Graphics – I and II By Arunoday Kumar Tech – Max Publication, Pune
2. Engineering Drawing & Graphics using Auto CAD 2000 By T. Jeyapoovan Vikas Publishing House Pvt. Ltd., New Delhi
3. A text book of Engineering Drawing By R.K.Dhawan S.Chand & Company Ltd., New Delhi
4. A text book of Engineering Drawing By P.S.Gill S.K.Kataria & sons, Delhi
5. Engineering Drawing with an Introduction to AutoCAD By D.A.Jolhe Tata McGraw-Hill Publishing Co. Ltd., New Delhi
6. Computer Aided Engineering Drawing, S. Trymbaka Murthy I.K.International Publishing House Pvt. Ltd., New Delhi

Semester – II - Environmental Studies

1. Introduction to Environment, Ecology and Ecosystem Definition and Inter-relationships amongst and between them, Components of Environment, Relationship between different components, Man-Environment relationship, Impact of Technology on the environment, Environmental Degradation.

2 Ecology & Ecosystems Introduction: Ecology- Objectives and Classification, Concepts of an ecosystem- structure & function of ecosystem, Components of ecosystem- Producers, Consumers, Decomposers, Bio-Geo- Chemical Cycles- Hydrological Cycle, carbon cycle, Oxygen Cycle, Nitrogen Cycle, Sulfur Cycle, Energy Flow in Ecosystem.

Food Chains: Grazing, Detritus, & Food webs, Ecological Pyramids. Major Ecosystems: Forest Ecosystem, Grassland Ecosystem, Desert Ecosystem, Aquatic Ecosystem, Estuarine Ecosystem.

3 Population & Natural Resources Development of Habitation patterns and Environmental factors governing human settlement, Population & Pollution , Reasons for overpopulation ,Population Growth, Demographic Projections and Population Structures , Production of food, Renewable & Nonrenewable Resources: Renewable Resources, Nonrenewable Resources, Destruction versus Conservation. Water Resources: Water Resources-Indian Scenario, Water Sources- Surface & Ground Water Sources, Uses & overuses of water resources, problems due to Overexploitation of Water Resources Forest Resources: Forest Resources - Indian Scenario, Importance of forests- Ecologically & Economically, Uses of forest products, Forest Types, Deforestations-Causes and effects, Forest Degradation in India Energy Resources: Energy Resources - Indian Scenario, Conventional Energy Sources & its problems, non-conventional energy sources-Advantages & its limitations , Problems due to Overexploitation of Energy Resources.

4 Environmental Pollution Types of Environmental Pollution. Water Pollution: Introduction – Water Quality Standards, Sources of Water Pollution, Classification of water pollutants, Effects of water pollutants, Eutrophication. Air Pollution : Composition of air , Structure of atmosphere, Ambient Air Quality Standards, Classification of air pollutants, Sources of common air pollutants like SPM, SO₂, NO_x – Natural & Anthropogenic Sources, Effects of common air pollutants. Land & Noise Pollution: Introduction- Lithosphere, Land Uses, Causes of land Degradation, Sources of Noise Pollution, Effects of noise pollution. Current Environmental Global Issues: Global Warming & Green Houses Effects, Acid Rain, Depletion of Ozone Layer

REFERENCE BOOKS :

- 1 Environmental Studies: R. Rajagopalan, Oxford University Press
- 2 Environmental Pollution: Causes, Effects & Control by K.C Agrawal
- 3 Environmental Science by Richard T Wright & Bernard J Nebel
- 4 Environmental Science by Daniel B Botkin & Edward A Keller
- 5 Environmental Engineering & Management by Suresh K Dameja
- 6 Environmental Management by Dr. Swapan C Deb
- 7 Environment & Ecology by Dr Gourkrishna Dasmohapatra
- 8 Introduction To Environmental Engineering and Science by Master Gilbert M.

Semester – II - Communication Skills

Unit – 1 Communication skills Process, types and levels of communication, Technical Communication and General Communication. Factors to be considered in technical communication.

Unit – 2 Verbal and non-verbal communication (kinesics) Components of Non-verbal Communication (Kinesics), Barriers to effective communication. (Noise in oral and written communication) Communication across cultures.

Unit – 3 Listening skills - Types of Listening Active Listening V/s Passive Listening Empathetic Listening. Traits of a good listener, barriers in effective listening, Tips for effective listening.

Unit – 4 Effective presentation strategies. Defining purpose, analysis of audience and locate, organizing contents. Preparing an outline of the presentation. Visual aids, nuances of delivery, Body language and effective presentation.

Unit – 5 Interviews Introduction, General preparations for an interview, Types of questions generally asked at the interviews. Types of interviews, Importance of nonverbal aspects.

Unit – 6 Group Discussions Introduction, Group discussions as a part of the selection process, guidelines for group discussion. Role functions in group discussion.

Unit – 7 Paragraph Development Introduction, Topic sentence and supporting sentences. Attributes of a good paragraph. Types of paragraphs.

Unit – 8 Letter – Writing Business Letters, Structure and types of a business letter, Letter of Inquiry, Letters of complaint, regret and adjustment.

Unit – 9 Technical reports Introduction, types of reports, structure of reports, objectives and characteristics of reports.

Unit – 10 Technical Proposals Definition, Purpose, Types, Characteristics, Structure, Style and appearance.

Unit – 11 Technical Descriptions Introduction, Definition of an object or a process. Guidelines for writing good description - organization, content, structure.

Unit – 12 Effective Reading Skills Purpose of reading, skimming and scanning. Tips for improving comprehension skills.

Unit – 13 Job application Essential parts - Cover Letter and the 'resume'. Types of 'resumes' (Curriculum Vitae) Chronological 'resume', functional 'resume'.

Unit – 14 Grammar and Vocabulary Tense and the concept of Time. Passive Voice, Conditionals Prepositions, Concord. Idioms, Confusables, one-word substitutes, homonyms, homophones eponyms.

Reference books:

1. Technical Communication Principles and Practice - Meenakshi Raman, Sangeeta Sharma (OUP)
2. Basic Communication Skills for Technology Andrea J. Rutherford (Pearson Education)
3. Communication Skills for Technical Students T.M. Farhathullah (Orient Longman)
4. A Textbook of English for Engineers and Technologists. Prepared by Humanities & Social Sciences Division. Anna University, Chennai. (Orient Longman)
5. Communication Skills for Engineers - Sunita Mishra, C, Murali Krishna (Pearson Education)
6. English for Technical Communication - K.R. Lakshminarayanan (Scitech Publications, Chennai.)
7. Basics of Management and Communication Skills - Dr. P.C. Shejwalkar (Everest Publishing House)
8. Business Communication Strategies - Matthukutty M. Monippally (Tata – McGraw – Hill)
9. Body Language - Allan Pease (Sheldon Press, London)
10. A Communicative Grammar of English - Geoffrey Leech, Jan Swartvik (ELBS – with Longman)