

SYLLABUS
SECOND SEMESTER
CIVIL ENGINEERING

ENGLISH AND COMMUNICATION SKILLS-II (992001)

I. Reading Skills

A Literature: Fiction and Poetry

1. Ruskin Bond : The Prospect Of Flowers
2. R K Narayan : An Astrologer's Day
3. Shakespeare : Let Me Not To The Marriage of True Minds (Sonnet No. 116)
4. John Keats : Ode To A Nightingale
5. Tagore : Thou Hast Made Me Endless (Verse-I Gitanjali)

II. Language and Writing Skills: Advanced Specific writing skills

- a) Notice
- b) Circulars
- c) Memo
- d) Agenda for a Meeting
- e) Minutes of the Meeting
- f) Press Release
- g) E-Mail
- h) Resume

III. Communication Skills

1. Barriers to Communication

- a) Barriers on the part of Sender
- b) Barriers on the part of Receiver
- c) Organisational and other barriers

2. Listening as a Tool of Communication

- a) Importance of Listening and Empathy
- b) Common Faults in Effective Listening
 - (1) Listening versus Hearing
 - (2) Poor Listening Habits
- c) Improving Listening Skill
- d) Humour in communication

PRACTICAL (Listening, Speaking and Communication Skills)

A. Interviews

1. Job Interviews
 - a) Stages of Interview
 - b) Face-to-face Interviews: Campus and On Site
 - c) Telephonic Interview

2. Media Interviews

3. Press Conference

B. Discussions

1. Introducing Oneself and Others

2. Leading and Directing Discussions

3. Expressing Opinions and Ideas

4. Expressing Agreement / Disagreement

5. Raising Questions

C. Group Discussions

1. Speaking in a Group Discussion

2. Discussing Problems and Solutions

3. Using Persuasive Strategies

4. Turn Taking Strategies

5. Effective Intervention

6. Reaching a Decision

D. Organisational GD

1. Brainstorming

2. Nominal Group Techniques

3. Delphi Technique

4. GD as Part of a Selection Process

E. Debate

1. Art of Debating

2. Debating Local Issues

3. Debating National Issues

4. Debating International Issues.

F. Watching a Film / Visual Presentation

1. Summarizing the Film / Visual Presentation

2. Critically Appreciating the Main Points

3. Leading a Further Discussion and Debate

APPLIED MATHEMATICS-II (992002)

Unit.I Co-ordinate Geometry

1.1 Equation of straight line in various standard forms (one point slope form, slope intercept form, two point form, intercept form & normal form), intersection of two straight lines, angle between two lines. Perpendicular distance formula.

1.2 General equation of a circle and its characteristics. To find the equation of a circle given (i) Centre and radius (ii) Three points on it (iii) Co-ordinates of end points of a diameter.

1.3 Equations of conics (ellipse, parabola and hyperbola), simple problems related to engineering (standard forms only).

Unit – II Integral Calculus

Unit – III Ordinary Differential

1.1- Definition, Order, Degree, Linear and Non-linear differential equations.

1.2 Formation of differential equations (upto second order).

1.3 Solution of first order differential equation-

(a) Variable Separable (b) Homogeneous (c) Reducible to Homogeneous (d) Linear differential

equation

(e) Bernoulli's Equation (simple problem) (f) Exact differential Equation.

Unit – IV Statistics

1.1-Measures of Central Tendency: Mean, Median, Mode

1.2. Measures of Dispersion: Mean deviation, Standard deviation

1.3. Co-efficient of rank correlation.

APPLIED PHYSICS-II (2003)

UNIT-I Structure of atom and Origin of Spectra (Qualitative only) (08 Periods)

- 1.1 Thomson's Model of atom, Rutherford's Model, Bohr's Model
- 1.2 Energy - levels of atom - concept of energy levels, ionizations and excitation potentials, Energy Band
- 1.3 Spectrum- Emission Spectrum & Absorption Spectrum Line Spectrum and Band Spectrum
- 1.4 Optics: Review of basic optics laws: reflection and refraction
- 1.5 Refraction and refractive index, total internal Reflection and their applications.

UNIT-II Electrostatics (13 Periods)

- 2.1 Coulomb's law, unit of charge, electric potential and electric potential difference
- 2.2 Electric field, electric field intensity, electric lines of force, electric flux and Gauss's Law
- 2.3 Applications of Gauss law in finding electric field of point charge, straight charged conductor, plane charged sheet and between two plane parallel charged sheets
- 2.4 Capacitance: types of capacitors, capacitance of parallel plate capacitor, series and parallel combination of capacitors, Dielectric and its effect on capacitance, and dielectric break down
- 2.5 Application of electrostatics in electrostatic precipitator.

UNIT-III Electricity (12 Periods)

- 3.1 Concept of electricity, current and its unit, direct and alternating current, voltage, resistance and resistivity, potential difference and e.m.f.
- 3.2 Ohm's law and its applications, concept of resistance, conductance, specific resistance, effect of temperature on resistance, temperature co-efficient of resistance, series and parallel combination of resistors. Introduction to super conductivity.
- 3.3 Kirchhoff's laws, Wheatstone bridge principle and its applications (Slide Wire Bridge)
- 3.4 Heating effect of current and concept of electric power, energy and their units, related numerical problems.

UNIT- IV Electromagnetism (13 Periods)

4.1 Magnetic field and its unit, magnetic intensity, magnetic lines of force, magnetic flux and their units, Right hand thumb rule, magnetic lines of force due to straight conductor, circular coil and solenoid

4.2 Force on a charge moving in a uniform magnetic field (Lorentz force). Force on a current carrying straight conductor. Torque on a current carrying rectangular coil. Force between two infinite parallel current carrying conductor.

4.3 Moving coil galvanometer; its principle, construction and working, conversion of a galvanometer into ammeter and voltmeter.

4.4 Electromagnetic induction; Faradays Laws, Lenz's Law. Self and Mutual Induction,. Eddy current.

UNIT-V Semiconductor physics (08 Periods)

5.1 Energy bands, intrinsic and extrinsic semiconductors, p-n junction diode and its characteristics

5.2 Diode as rectifier – half wave and full wave rectifier. Transistor: pnp and npn (concept only). Types of Diodes.

UNIT-VI Modern Physics(10 Periods)

6.1 Electromagnetic spectrum, photo electric effect and work function, X rays properties, applications of X- rays in medicine and industries.

6.2 Lasers: spontaneous and stimulated emission; lasers and its characteristics, population inversion, types of lasers and its engineering and medical applications.

6.3 Fiber optics: introduction to optical fiber materials, types, light propagation and applications in Communication and Medical.

LIST OF PRACTICALS (To perform minimum Six experiments)

1. Conversion of Galvanometer into an Ammeter of given range.
2. Conversion of Galvanometer into Voltmeter of given range.
3. To verify ohm's laws by drawing a graph between voltage and current.
4. To verify laws of resistances in series and in parallel combinations.
5. To draw characteristics of a pn junction diode and find resistance of diode
6. Verification of Kirchhoff's Laws
7. Determination of resistivity by Meter bridge

8. To assemble the components of a given electrical circuit.
9. To identify a Diode, LED, transistor, Resistor, Capacitor from mixed collection of such items and draw their notation.
10. Use of Multi meter to :
 - (i) To measure value of given resistance.
 - (ii) Distinguish between n-p-n and p-n-p transistors.
 - (iii) See the unidirectional flow of a current in case of a Diode and LED

APPLIED CHEMISTRY-II (992004)

1. Metallurgy (12 Periods)

1.1 Introduction of Metallurgy, mineral, ore, gangue or matrix, flux and slag, Concentration methods of the ores. roasting, calcination, smelting and refining as applied in relation to various metallurgical operations

1.2 Metallurgy of (i) Aluminum (ii) Iron

1.3 Definition of an alloy, purposes of alloying, composition and uses of alloys like magnalium, duralumin, alnico, invar and stainless steel.

2. Fuels and combustion (16 Periods)

2.1 Introduction of 'Fuel', characteristics of a good fuel and classification of fuels with suitable examples

2.2 Definition of Calorific value of a fuel and its determination for a solid fuel with the help of Bomb calorimeter with simple numerical problems.

2.3 Manufacture, composition, properties and uses of (i) Water gas (ii) Oil gas (iii) Biogas (iv) Compressed Natural gas (CNG) 2.4 Octane Number ,Cetane Number and Power alcohol

2.4 Nuclear Fuel-Fission and fusion.

3 Corrosion and its Preventions (08Periods)

3.1 Meaning of the term 'corrosion' and its definition

3.2 Theories of corrosion (i) direct chemical action theory and (ii) electro chemical theory

3.3 Prevention of corrosion by

(a) Alloying

(b) Providing metallic coatings

(c) Sacrificial cathodic protections

4 Lubricants (08 Periods)

4.1 Definition of (i) lubricant (ii) lubrication

4.2 Classification of lubricants

4.3 Principles of lubrication

(i) fluid film lubrication

(ii) boundary lubrication

4.4 Properties of lubricants

4.5 Importance of additives in lubricants

4.6 Dewaxing and solvent refining of liquid lubricants.

5. Silicate Technology(04 Periods)

5.1 General introduction to cement, varieties of cements raw materials of cements.

5.2 Manufacture of Cement (i) Wet Process (ii) Dry Process. Setting and Hardening of cements.

5.3 Definition of Glass, Different variety of glass, raw material, Manufacture of glass.

6. Classification and Nomenclature of Organic Compounds (16 Periods)

6.1 Classification of Organic Compounds, functional group, Homologous Series, difference between organic and inorganic compound.

6.2 Physical and Chemical properties and industrial use of Organic Compound

6.3 IUPAC system of nomenclature of Carboxylic acid, Alcohols, Phenols, Aldehydes, Ketones and Amines (first five members of each series only).

7. Chemistry of engineering material (08 Periods)

7.1 Introduction and Definition of Polymers.

7.2 Plastics-

7.2.1 Classification and constituent, Type of polymerization Thermoplastic and Thermosetting polymer .

7.2.2 Preparation Properties and uses of polyethylene, Bakelite, Terylene, PVC, Teflon, urea formaldehyde and Nylon.

7.3 Rubber

7.3.1.Natural Rubber and vulcanization of rubber, Synthetic Rubber, Buna-N, Buna-S, Butyl and Neoprene.

LIST OF PRACTICALS

1. Gravimetric analysis and study of apparatus used there in.

2. To determine the percentage composition of a mixture consisting of a volatile and a non-volatile substances.

3. Estimate the amount of moisture in the given sample of coal.

4. Esterification and ceric ammonium tests of alcohol.
5. Sodium carbonate and Ester test of carboxylic acids
6. To determination the amount of copper in the given sample of copper sulphate with the help of N/20 sodium thiosulphate solution.
7. Detection of metal iron in the rust (solution of rust in concentrated HCR may be given)
8. Demonstration to determine calorific value of a solid fuel with the help of Bomb Calorimeter.

ENVIRONMENTAL SCIENCE & ENERGY MANAGEMENT (992005)

Unit : 1 Environment, Ecosystem and Natural Resources. (11 Periods)

Definition of Environment.

Scope of Environment.

Effects of Environment on human life.

Concept of ecosystem.

Components of ecosystem.

Structure of ecosystem.

Function of ecosystem.

Aspects, Methods, objectives and principle of sustainable Development.

Water and forest resources.

Unit : 2 Environmental Pollution, Social issues and the Environment. (12 Periods)

Air pollution

Water Pollution

Soil Pollution

Marine pollution

Noise pollution

Thermal pollution

Solid waste Management : Nature of wastes, Disposal methods, waste-to-energy, Industrial waste.

Role of an individual in prevention of pollution.

Unit : 3 Social Issues and Environments. (10 Periods)

Water conservation, rain water harvesting, water shed management.

Climate change, global warming, acid rain, ozone layer depletion.

Disaster management.

Green Building Technology

Environment Protection Act.

Air (prevention and control of pollution) Act.

Water (prevention and control of pollution) Act.

Role of Organic farming, bio-fertilizers and bio-pesticides in environment protection.

Unit : 4 Energy Conservation efficiency and energy Audit (10 Periods)

Energy Conservation and objectives.

Energy efficiency.

Energy Conservation in lighting arrangement and appliance used in domestic sector.

Needs for energy efficient devices.

Energy efficient motors.

How to maximize the efficiency of equipments.

CFL and LED lamps.

Needs of energy audit.

Energy Audit methodology.

About bureau of Energy efficiency and its scheme.

Unit : 5 Renewable Energy (5 Periods)

Introduction.

Types of Renewable Energy source.

Electric vehicle

ENGINEERING GRAPHICS- II (992006)

Unit 1 Introduction to Section of Solids(12 Periods)

Why is sectioning necessary, Hatching –BIS Conventions, Section of Prisms and Cubes, Section of Pyramids and Tetrahedrons, Section of Cylinders, Section of Cones, Section of Spheres, Section of Combinations of Solids and Section of Truncated or Frustum Solid, Sectional views & Conventions of Materials and Steel Sections. (03 sheets)

Unit 2 Development of Surfaces (12 Periods)

Method of development of Lateral surface, Development of Cubes, Development of Prism and Cylinder, Development of Truncated Prism and Cylinders, Development of Pyramids and Cones, Development of Frustum or Truncated Pyramids and Cones and their Application Such as Tray, Funnel, Chimney, Pipe Bends etc. (03sheets)

Unit 3 Threads (03 sheets) (12 Periods)

Nomenclature of threads, Types of threads, Forms of various external thread, Sections such as V, Square and Acme threads, BA, BSW and Knuckle, Metric, Seller Thread, Buttress Threads, Simplified conventions of left hand and right hand threads, both external and internal threads, Single start, double start and multiple start threads.

Unit 4- Nuts and Bolts (03 sheets) (09 Periods)

Different views of hexagonal and square nuts; Assembly of hexagonal headed, square headed, square headed with square neck, bolts with hexagonal and square nuts and washers. Locking Devices -Lock nut, castle nut, split pin nut, sawn nut, slotted nut.

Unit 5 - Screws, Studs and Washers (02 sheet) (09 Periods)

Drawing various types of machine screws, Drawing various types of studs and set screws, drawing various type of wooden screws.

Unit 6 - Keys and Cotters (03 sheets) (12 Periods)

Various types of keys and cotters and their practical application and Preparation of drawing of various keys and cotters showing keys and Cotters in position, Cotter joints (i) Gib and Cotter Joint (ii) Knuckle Joint

Unit -7 Free hand sketching (03 sheets) (15 Periods)

Rivets and Riveted Joints , Types of structural and general purposes rivet heads, Caulking and fullering of riveted joints, Types of riveted joints – lap, butt (single riveted, double riveted lap joint, single cover plate and double cover plate), chain and zig – zag riveting, Muff or Box coupling, half lap muff coupling.

GENERAL WORKSHOP PRACTICE-II (992007)

1. SHEET METAL SHOP(30 Periods)

- 1.1 Layout of Shop
- 1.2 Sketch & Label Details of shop lay out.
- 1.3 Know the different jobs produced in sheet metal shop e.g. Open tray, cylinder, prism, Funnel etc.
- 1.4 Commonly used raw materials: -M.S. sheet (black), G.I. sheet, M.S. Rivets, and aluminum rivet etc.
- 1.5 Understand foil, sheet and plate.
- 1.6 Tools used:-Different snips, shears, stacks, latter punch, figure punch, Solid punch, hollow punch, mallet, soft hammers, channel, Square bars, std. Sheet gauge.Types of Joints and Operations.
- 1.7 Introduction of various sheet metal operations & joints e.g. seaming, single seam, double seam, Grooved seam, corner joint, cap joint etc.
- 1.8 Preparation of job (any two): - Open tray, cylinder, prism, Funnel etc.
- 1.9 Choose correct shape &size of sheet for a given job drawing considering allowances for joint or seam.
- 1.10 Do marking as per drawing using correct method, tools and sequence.
- 1.11 Identify correct operation e.g. shearing, punching, bending, debarring, folding, strengthening, stamping, riveting, etc.
- 1.12 Select appropriate Tool , inspection & measuring Instruments.
- 1.13 Holding the job in correct position.
- 1.14 Perform the operation with appropriate body posture, method & precision, exercising personal Judgment of need of the force.
 - 1.15 Inspect for proper joint quality and take remedial steps.

2. WELDING SHOP(30 Periods)

- 2.1 Layout of Shop
- 2.2 Sketch & Label Details of shop Layout
- 2.3 Types of welding
- 2.4 Type of jobs produced in Welding shop e.g. Lap joint, single butt, double butt, corner, T joint, etc
- 2.5 Tools & equipments used:-Specifications & use of various tools and equipments used in Welding shop e.g. . A.C. welding transformer, Gas welding set, electrode used, chipping hammer, wire brush, shield, gloves, apron etc

2.6 Preparation of job: - Lap joint, single butt, double butt, corner, T joint, etc.

2.7 Safety measures:- Know the safety regulation in Welding shop.

3. BLACK SMITHY SHOP(25 Periods)

3.1 Understand the function of black smithy & forging shop

3.2 Layout of Shop

3.3 Sketch & Label Details of shop layout

3.4 Know the different jobs produced in smithy shop e.g. round to hexagonal shapes or vice versa J-hook, S-hook, circle, chain etc

3.5 Commonly used raw materials: - M.S. Bars of different shapes and size

3.6 Smithy Tools: - Know various smithy tools with their specifications e.g. different type of hammers, hot / cold chisel, flatters, tongs, leg vice, swage, block, anvils, open hearth and furnaces etc

3.7 Preparation of job : J-hook, S-hook, chain, circle, tong, chisel etc.

3.8 Safety measures: Know the safety regulation in black smithy shop.

4. ELECTRONIC SHOP(25 Periods)

4.1 Identification and familiarization with the following tools used in electronic shop: Such as Tweezers, Screw drivers (different sizes), Insulated Pliers, Cutter, Sniper, Philips Screw Driver (Star Screw Driver), L- Keys, Soldering Iron, soldering wire, flux . Their demonstration and uses.

4.2 Identification and familiarization with Multimeter (analog and digital)

4.3 Identification and familiarization with ear phone speaker connector, telephone jacks and similar male and female connectors (audio, video)

4.4 Identification and familiarization with soldering and desoldering practice

4.5 Introduction to thimbles and crimping tools

4.6 Cut, strip, join an insulated wire with the help of soldering iron with different types of wires.

5. PLASTIC MOULDING(18 Periods)

5.1 Know the commonly used plastic materials i.e. Thermosetting, Thermo plastic.

5.2 Sketch & label various parts of bench moulding m/c

5.3 Production of any product on bench moulding m/c

