Second Semester

ENGLISH AND COMMUNICATION SKILLS – II (DAS-206)

Humanities and Social Sciences (HU): Credits 3(3-0-0)

Objective: Interpersonal communication is a natural and necessary part of organizational life. Yet, communicating effectively can be challenging because of our inherent nature to assume, overreact to and misperceive what actually is happening. Poor communication or lack of communication is often cited as the cause of conflict and poor teamwork. In today's team-oriented workplace, managing communication and developing strategies for creating shared meaning are crucial to achieve results and create successful organizations. The goal of the Communicating Skills course is to produce civic-minded, competent communicators. To that end, students must demonstrate oral as well as written communication proficiency

COURSE OUTLINE:

Section A

FACETS OF LITERATURE

1. Fiction
    1. The Portrait of a Lady - Khushwant Singh
    2. The Doll's House – Katherine Mansfield
    3. The Refugees – Pearl S. Buck
2. Prose
    1. Of Truth – Francis Bacon
    2. Praises of Solitude – Samuel Johnson
    3. A Gentleman – John Henry Newman
3. Poems
    1. All The World's A Stage – W. Shakespeare
    2. A Solitary Reaper – William Wordsworth

Section B

2. READING SKILLS
Unseen comprehension passages (at least 3 passages).

3. WRITING SKILLS
Writing Notice

1. Writing Circular
2. Writing a Memo
3. Agenda for a Meeting
4. Minutes of the Meeting
5. Press release
6. Telephonic Messages
7. Paragraph writing:

Simple and Current Topics should be covered.

4. Correspondence

1. Business Letters
2. Personal Letters

5. Communication

1. Media and Modes of Communication
2. Channels of Communication
3. Barriers to Communication

4. Listening Skills

5. Body language

6. Humour in Communication

LIST OF PRACTICALS (Note: The following contents are only for practice. They should not be included in the final theory examination)

1. LISTENING COMPREHENSION

1.1 Locating Main Ideas in a Listening Excerpt

1.2 Note-taking

2. DEVELOPING ORAL COMMUNICATION SKILLS

2.1 Offering-Responding to Offers

2.2 Requesting-Responding to Requests

2.3 Congratulating

2.4 Expressing Sympathy and Condolences

2.5 Expressing Disappointments

2.6 Asking Questions-Polite Responses

2.7 Apologizing, Forgiving

2.8 Complaining

2.9 Persuading

2.10 Warning

2.11 Asking for and Giving Information

2.12 Giving Instructions

2.13 Getting and Giving Permission

2.14 Asking For and Giving Opinions

2.15 Group Discussion

LIST OF REFERENCE BOOKS

1. Communicating Effectively in English, Book-I by Revathi Srinivas; Abhishek Publications, Chandigarh.

2. High School English Grammar and Composition by Wren & Martin; S. Chand & Company Ltd., Delhi.

Communication Techniques and Skills by R. K. Chadha; Dhanpat Rai Publications, New Delhi

APPLIED MATHEMATICS – II (DAS-203)

Basic Science (BS) Core: Credit 4(3-1-0)

Objective: Applied Mathematics forms the backbone of engineering students. The curriculum of mathematics has undergone changes from time to time in accordance with growth of subject. Diploma in Engineering is a launching stage where the students learn the basics of engineering. The revised syllabus has been designed keeping in view the emerging needs of all categories of students. Great emphasis has been laid on application of various contents like differential calculus, integral calculus, differential equations and statistics. This course will develop analytical abilities to make exact calculations and provide continuing educational base to the student.

COURSE OUTLINE:

1. Differential Calculus

1. Definition of function; Concept of limits.

   Four standard limits $\lim_{x \to a} \frac{x^n - a^n}{x - a}$,

   $\lim_{x \to 0} \frac{\sin x}{x}$, $\lim_{x \to 0} \frac{a^x - 1}{x}$, $\lim_{x \to 0} (1+x)^{1/x}$

2. Differentiation by definition of x^n , sin x, cos x, tan x, e^x, $\log_a x$ only

3. Differentiation of sum, product and quotient of functions. Differentiation of function of a function.

4. Differentiation of inverse trigonometrical functions, Logarithmic differentiation, Exponential differentiation, Successive differentiation (upto third order only).

5. Applications:

   1. Maxima and minima

   2. Equation of tangent and normal to a curve (for explicit functions only) – Simple problems only

2. Integral Calculus

1. Integration as inverse operation of differentiation

2. Simple standard integrals and related problems

   Simple integration by substitution, by parts and by partial fractions (for linear factors only)

4. Properties of definite integrals

5. Evaluation of definite integrals (simple problems)-

   Evaluation of $\int_0^{\pi/2} \text{Sin}^n x\, dx$, $\int_0^{\pi/2} \text{Cos}^n x\, dx$, $\int_0^{\pi/2} \text{Sin}^m x \text{Cos}^n x\, dx$

   using formulae without proof (m and n being positive integers only)

6. Numerical integration by Simpson's Rule and Trapezoidal Rule (simple problems only)

3 Ordinary Differential Equations

1. Definition, order, degree, linear and non-linear differential equations

2. Formation of differential equations (up to second order)

3. Solution of first order differential equations (a) Variable Separable (b) Homogeneous (c) Linear and (d) Exact.

4. Statistics

1. Measures of Central Tendency: Mean, Median, Mode

2. Measures of Dispersion: Mean deviation, Standard deviation

3. Co-efficient of rank correlation

RECOMMENDED BOOKS

1. Applied Mathematics by Dr. RD Sharma, Dhanpat Rai Publications, Delhi

2. Elementary Engineering Mathematics by BS Grewal, Khanna Publishers, New Delhi

3. Applied Mathematics-I (Hindi) by Dr. Kailash Sinha, Nav Bharat Publication, Meerut.

APPLIED PHYSICS – II (DAS-205)

Basic Science (BS) Core: Credit 4(3-0-2)

Objective: Applied physics includes the study of a large number of diverse topics related to things that go in the world around us. It aims to give an understanding of this world both by observation and prediction of the way in which objects behave. Concrete use of physical principles and analysis in various fields of engineering and technology

COURSE OUTLINE:

1. Optics

    1. Review of basic optics laws: reflection and refraction

    2. Refraction and refractive index, image formation in lenses, image magnification, lens formulae (thin lens only), power of lens, total internal reflection and their applications

    3. Simple and compound microscope, astronomical telescope, magnifying power and its calculation (in each case), Terrestrial and Galileo's telescope (Concept only)

2. Electrostatics

Coulombs law, unit of charge, electric potential and electric potential difference

1. Electric field, electric field intensity, electric lines of force, electric flux Gauss's Law

2. Applications of Gauss law in finding electric field of point charge, straight charged conductor, plane charged sheet and between two plane parallel charged sheets

3. 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

3. DC Circuits

1. Concept of electricity, current and its units, direct and alternating current, voltage, resistance and resistivity, potential difference and e.m.f., Concept and

   applications of potentiometer.

2. Ohm's law and its applications, concept of resistance, conductance, specific resistance, effect of temperature on resistance, co-efficient of resistance, series and parallel combination of resistors, introduction to super conductivity.

3. Kirchhoff's laws, Wheatstone bridge principle and its applications (Slide Wire Bridge)

4. Heating effect of current and concept of electric power, energy and their units, related numerical problems

5. Application of electricity in various equipments, advantages of electrical energy over other forms of energy

4. Electromagnetism

1. Magnetic field and its units, 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

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.

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

4. Electromagnetic induction, Faradays Laws, Lenz's Law.

5. Applications of Electromagnetism

5. Semiconductor physics

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

Diode as rectifier – half wave and full wave rectifier, semiconductor transistor pnp and npn (concept only)

6. Modern Physics

1. Electro magnetic spectrum, photo electric effect and work function, X rays - properties, production and their applications in medicine and industries.
2. Lasers: concept of energy levels, ionizations and excitation potentials; spontaneous and stimulated emission; lasers and its characteristics, population inversion, types of lasers, Helium- Neon and ruby lasers, their engineering and medical applications
3. Fiber optics: introduction to optical fiber materials, types, light propagation and applications in communication

LIST OF PRACTICALS (To perform minimum eight 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 connection.
5. To draw characteristics of a pn junction diode and determine knee and break down voltages
6.Verification of Kirchhoff's Laws
7. Determination of resistivity by Wheatstone bridge
8. To determine the resistance of electronic components by multimeter
9. Determination of internal resistance of primary cell by using ammeter and voltmeter
10. To determine emf of primary cell using potentiometer and standard voltage source.

RECOMMENDED BOOKS

1. Text Book of Physics for Class XI (Part-I, Part-II) N.C.E.R.T

2. Applied Physics, Vol. I and Vol. II, TTTI Publications, Tata McGraw Hill, Delhi

APPLIED CHEMISTRY-II (DAS-204)

Basic Science (BS) Core: Credit 4(3-0-2)

Objective: The role of Chemistry and chemical products in every branch of engineering is expanding greatly. Now a days various products of chemical industries are playing important role in the field of engineering with increasing number of such products each successive years. The strength of materials, the chemical composition of substances, their behaviour when subjected to different treatment and environment, and the laws of heat and dynamic energy have entered in almost every activity of modern life. Chemistry is considered as one of the core subjects for diploma students in engineering and technology for developing in them scientific temper and appreciation of chemical properties of materials, which they have to handle in their professional career.

COURSE OUTLINE:

1. Metallurgy

1. A brief introduction of the terms: Metallurgy, mineral, ore, gangue or matrix, flux, slag, concentration (methods of concentrating the ores), roasting calcination and refining as applied in relation to various metallurgical operations

2. Metallurgy of (i) Aluminium (ii) Iron

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

2. Fuels

1. Definition of a 'Fuel', characteristics of a good fuel and classification of fuels with suitable examples

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.

3. Merits of gaseous fuels over those of other varieties of fuels

4. Manufacture, composition, properties and uses of (i) Water gas (ii) Oil gas (iii) Biogas (iv) Compressed Natural gas (CNG)

5. Octane Number and Cetane Number

3 Corrosion

1. Meaning of the term 'corrosion' and its definition
2. Theories of corrosion i.e. (i) direct chemical action theory and (ii) electro chemical theory
3. Prevention of corrosion by

    1. Alloying
    2. Providing metallic coatings

    (c). Sacrificial cathodic protections:

4 Lubricants

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 Characteristics of a lubricant such as viscosity, viscosity index, volatility, oxidation, oiliness, acidity, emulsification, flash point, fire point and pour point.

4.5 Importance of additives in lubricants

4.6 Dewaxing and solvent refining of liquid lubricants

5 Cement and Glass

1. General introduction to cement and glass

2. Manufacture of Cement

3. Manufacture of ordinary glass and lead glass

6. Classification and Nomenclature of Organic Compounds

1. Classification of Organic Compounds, functional group, Homologus Series

2. Physical and Chemical properties, and industrial use of Organic Compound

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

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 alcohal
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 HCL may be given)
8. Demonstration to determine calorific value of a solid fuel with the help of Bomb Calorimeter

RECOMMENDED BOOKS

1. Chemistry in Engineering by J.C. Kuriacose and J. Rajaram; Tata McGraw-Hill Publishing Company Limited, New Delhi
2. Engineering Chemistry by Dr. S. Rabindra and Prof. B.K. Mishra ; Kumar and Kumar Publishers (P) Ltd. Bangalore-40

ENVIRONMENTAL SCIENCE (EVS-202)

Basic Engineering and science (BES) Core: Credit 3(3-0-0)

Objective: A diploma holder must have knowledge of different types of pollution caused due to industries and constructional activities so that he may help in balancing the eco system and controlling pollution by pollution control measures. He should also be aware of environmental laws related to the control of pollution

COURSE OUTLINE:

1. Scope of Environmental Science: Definition, meaning, scope, Inter relationships and importance of the study of environmental science.
2. Environmental and ecological principles: Ecological terminology and definitions, ecosystem and its components (both terrestrial and aquatic), energy flow, food chain, food web, and ecological pyramids.
3. Overview of Solid waste management .Natural resources: Water, land forest, minerals, wildlife, biodiversity, etc. with particular reference of natural resources of India and their current status, biodiversity loss and its conservation.
4. Basics of Environmental Impact Assessment (EIA), Environmental disruptions: A) Pollution: Types, Sources, effects and control of air and water pollution. B) Biotic activities: deforestation, grazing, burning and mining etc. and their influences in environment and agriculture, effect of industrialization on environment. C) Introduction to global environment problems, viz., acid rain, ozone depletion, greenhouse gases and climate changes.
5. Current issues in environmental pollution and its control, role of non-conventional

   Sources of energy in environmental protection. Environmental Management and ethics: Basic environmental laws and policies, national and international environmental conservation and organization, effect of population on environment.

RECOMMENDED BOOKS

1. Environmental and Pollution Awareness by Sharma BR; Satya Prakashan, New Delhi.
2. Environmental Protection Law and Policy in India by Thakur Kailash; Deep and Deep Publications, New Delhi.

Environmental Engineering and Management by Suresh K Dhamija; SK Kataria and Sons, New Delhi.

ENGINEERING DRAWING – II (DED-201)

Basic Engineering and Science (BES) Core: Credit 2(0-0-4)

Objective: Drawing is said to be the language of engineers and technicians. Reading and interpreting engineering drawing is their day-to-day responsibility. The course is aimed at developing basic graphic skills so as to enable them to use these skills in preparation of engineering drawings, their reading and interpretation

COURSE OUTLINE:

1. Section of Solids by Different Cutting Planes

2. Development of Surfaces (2 sheets)

   Development of surfaces – cubes, prisms, (square, pentagonal and hexagonal), cylinders, pyramids (square, pentagonal, hexagonal) and cones

3. Detail and Assembly Drawing (2 sheets)

   1. Principle and utility of detail and assembly drawings

   2. Wooden joints i.e. corner mortice and tenon joint, Tee halving joint, Mitre faced corner joint, Tee bridle joint, Crossed wooden joint, Cogged joint, Dovetail joint, Through Mortise and Tenon joint

4. Threads (2 sheets)

   1. Nomenclature of threads, types of threads (metric), single and multiple start threads
   2. Forms of various external thread sections such as V, square and acme threads, BA, BSW and Knuckle, Metric, Seller Thread, Buttress Threads
   3. Simplified conventions of left hand and right hand threads, both external and internal threads

5. Locking Devices (1 sheet)

   Lock nut, castle nut, split pin nut, sawn nut, slotted nut

6. Nuts and Bolts (3 sheets)

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. Foundations bolts – Rag bolt and Lewis bolt

7. Screws, Studs and Washers (1 sheet)

    1. Drawing various types of machine screws

    2. Drawing various types of studs and set screws

8. Keys and Cotters (2 sheets)

    1. 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

    2. Cotter joints (i) gib and cotter joint (ii) knuckle joint

9. Rivets and Riveted Joints (2 sheets)

    1. Types of structural and general purposes rivet heads

    2. Caulking and fullering of riveted joints

    3. Types of riveted joints – lap, butt (single riveted, double riveted lap joint, single cover plate and double cover plate), chain and zig – zag riveting

10. Welded Joints (1 sheet)

    1. Various conventions and symbols of welded joints (IS 696)

    2. Practical applications of welded joints say joints on steel frames, windows, doors and furniture

11. Couplings (2 sheets)

    1. Muff or Box coupling, half lap muff coupling

2. Flange coupling (Protected and non-protected)

3. Flexible coupling

12. AutoCAD (for practical's and viva only)

1. Practice on drawing commands, editing commands

2. Practice on sectioning and hatching

3. Practice on preparing simple drawings

RECOMMENDED BOOKS

1 Engineering Drawing by C M Verma, Takniki Parkashak, Roorkee. .

2. Elementary Engineering Drawing by ND Bhatt, Charotar Publishing House

GENERAL WORKSHOP PRACTICE – II (DAS-207)
Basic Engineering and Science (BES) Core: Credit 2(0-0-4)

Objective: Psychomotor skills are mastered through practice, an opportunity therefore, has been extended to students through this course to refine their skills in different trades. The basic skills developed during first semester will be refined during this course by doing higher order skills jobs. In addition to developing general manual and machining skills in the students, the objective of development of sense of dignity of labour, precision, safety at work places, team working and right attitude among the students will also be met.

COURSE OUTLINE:

The following shops are included in the syllabus.

1. Carpentry and Painting shop-II

2. Fitting and Plumbing Shop

3. Welding shop -II

4. Electric shop -II

Electronic shop-II or Machine Shop

RECOMMENDED BOOKS

1. Workshop Technology I,II,III, by S K Hajra, Choudhary and A K Choudhary. Media Promoters and Publishers Pvt. Ltd., Bombay