

2.1 ENGLISH AND COMMUNICATION SKILL - II SEMESTER - II THEORY

I. Reading Skills:

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 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) E-mail
- g) 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

SEMESTER - II 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. Summarising the Film / Visual Presentation
2. Critically Appreciating the Main Points
3. Leading a Further Discussion and Debate

2.2 Applied Mathematics

Subject code: 2002

Course Title: Applied Mathematics(Common)

1. RATIONALE

Mathematics is the core course to develop the competencies of most of the technological courses. The subject Applied Mathematics is being introduced into the diploma course to provide mathematical background to the students so that they can be able to grasp the engineering subjects properly. Applied Mathematics is widely used in every engineering fields. Mathematics is more than too for solving problems, mathematics course can develop intellectual maturity. This course is an attempt to initiate the multi-dimensional logical thinking and reasoning capabilities. It will help to apply the principles of basic mathematics to solve related technology problems. Hence, the course provides the insight to analyze engineering problems scientifically using integration, application of integration, differential equation, coordinate geometry and statistics.

2. COURSE OUTCOMES

The theory practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above mentioned competency:

- Apply the concepts of Integration to solve engineering related problems.
- Utilize basic concepts of geometry to solve elementary engineering problems.
- Apply the concept of differential equation to solve basic engineering problems.
- Use basic concepts of statistics to solve engineering related problems.

3. TEACHING AND EXAMINATION SCHEME

Teaching Scheme In hour				Total Credits L+T+P	Examination Scheme				Total
					Internal Assessment		External Assessment		
L	T	P	C	Theory	Practical	Theory	Practical		
Hrs/Week				MM	MM	MM	Hrs	Hrs.	

3	2	-	5	50	-	100	2:30	-	-	150
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4. THEORY COMPONENTS

The following topics/subtopics should be taught and assessed in order to develop LOs in cognitive domain for achieving the COs to attain the identified competency.

Unit	Topics and Sub-topics
Unit – I Co-ordinate Geometry (25 Periods)	1.1-Equation of straight line in various standard forms (point slope form, slope intercept form, two point form, intercept form & normal form), inter section 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 (30 Periods)	1.1-Integration as inverse operation of differentiation with simple examples. 1.2 Simple Standard integrals and related problems. 1.3-Simple integration by substitution, by parts and by partial fractions (for linear factors only). 1.4 Properties of definite integrals. 1.5Evaluation of definite integrals (simple problems)- Evaluation of $\int_0^{\pi/2} \text{Sin } x \cdot dx$, $\int_0^{\pi/2} \text{Cosn } x \cdot dx$, $\int_0^{\pi/2} \text{Sinm } x \cdot \text{Cosn } x \cdot dx$ using formulae without proof (m and n being positive integers only) 1.6-Applications of integration for : (a) Simple problem on evaluation of area bounded by a curve and axes. (b) Calculation of volume of a solid formed by revolution of an area about axes (Simple problems). (c) Numerical integration by Simpsons's Rule and Trapezoidal Rule (Simple problems).
Unit – III Ordinary Differential Equations (10	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

Periods)	Homogeneous (d) Linear differential equation (e) Bernoulli's Equation (simple problem) (f) Exact differential Equation.
Unit – IV Statistics (15 Periods)	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.

Suggested distribution of marks

Topic No.	Time allotted for lectures and tutorials (Periods)	Marks Alloted
1	25	30
2	30	35
3	10	15
4	15	20
Total	80	100

2.3 APPLIED PHYSICS – II

	L	T	P
Periods/week	3	2/2	2

RATIONALE

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

Note:- Teachers should give examples of engineering/technology applications of various concepts and principles in each topic so that students are able to appreciate learning of these concepts and principles.

DETAILED CONTENTS

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 in 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, 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 connection.
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

INSTRUCTIONAL STRATEGY

Teacher may use various instructional media like models, charts and graphs while imparting instructions. The field application should be made clear before teaching the basics of waves, sound, light, electrostatics, dc circuits, electromagnetism, and semiconductor physics etc to develop proper understanding of the physical phenomenon. Use of demonstration can make the subject interesting and develop scientific temper in the students.

SUGGESTED DISTRIBUTION OF MARKS

Unit no.	Time Allotted for lectures and Tutorials (Periods)	Marks allotted (%)
1	08	15
2	13	20
3	12	20
4	13	20
5	08	10
6	10	15
TOTAL	64	100

2.4 APPLIED CHEMISTRY-II

L T P

Periods/Week 3 2/2 2

RATIONALE

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. Effort should be made to teach this subject through demonstration and with the active involvement of students.

DETAILED CONTENTS

1. Metallurgy

(12 Periods)

- 1.1 Introduction of Metallurgy, mineral, ore, gangue or matrix, flux, 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.

Fuels and 2. 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) Octane Number, Cetane Number and Power alcohol
- 2.4 Nuclear Fuel-Fission & fusion.

3 Corrosion and its Preventions

(08Periods)

- 3.1 Meaning of the term 'corrosion' and its definition
- 3.2 Theories of corrosion i.e. (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 Dew axing and solvent refining of liquid lubricants

5. Silicate Technology

- 5.1 General introduction to cement, varites of cements raw materials of cements.
- 5.2 Manufacture of Cement (i) Wet Process (ii) Dry Process. Setting and Hardening of cements.
- 5.3 Defination of Glass, Different variety of glass and raw material Manufacture of glass.

6. Classification and Nomenclature of Organic Compounds

(16 Periods)

- 6.1 Classification of Organic Compounds, functional group, Homologus Series, difference between organic & 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 & 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 determine 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

3. A Text Book of Applied Chemistry-II by SS Kumar; Tata McGraw Hill, Delhi
4. A Text Book of Applied Chemistry-II by Sharma and Others; Technical Bureau of India, Jalandhar
5. Engineering Chemistry by Jain PC and Jain M,
6. Chemistry of Engineering by Aggarwal CV,
7. Chemistry for Environmental Engineers by Swayer and McCarty, McGraw Hill, Delhi
8. Progressive Applied Chemistry –I and II by Dr. G.H. Hugar; Eagle Prakashan, Jalandhar
9. Applied Chemistry-II by Dr. J K Sharma, Abhishek Publications, Sector 17-C, Chandigarh.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted for Lectures and Tutorials (Periods)	Marks Allotted (%)
1	08	10
2	12	20
3	08	20
4	08	20
5	04	10
6.	16	10
7	08	10
Total	64	100

2.5 ENVIRONMENTAL SCIENCE

	L	T	P
Periods / Week	3	-	-

Rationale

The importance of environment science cannot be disputed. The need for sustainable development is a key to the future of mankind. A diploma holder must have knowledge of different types of pollution caused due to industries,

constructional activities and agricultural inputs so that he may help in balancing the ecosystem and controlling pollution by pollution control measures. He should also be aware of various social issues on environment and environment laws related to the control of pollution.

Detailed Contents

UNIT 1: Introduction

(02)

- Definition of Environment and Environment Science
- Scope and Importance
- Need for Public awareness.

UNIT 2: Natural Resources and Associated Problems

(13)

- Forest resources: Use and over-exploitation, deforestation, Timber extraction, mining, dams and their effects on forests and tribal people, case studies.
- Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dam's benefits and problems.
- Mineral Resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
- Food Resources: World food problems, changes caused by agriculture and over grazing, effects of modern agriculture, fertilizers- pesticides problems, water logging, salinity, case studies.
- Energy Resources: Growing energy needs, renewable and nonrenewable energy sources, use of alternate energy sources, case studies
- Land Resources: Land as a resource, land degradation, man induces landslides, soil erosion, and desertification.
- Role of individual in conservation of natural resources.

UNIT 3: Eco Systems

(04)

- Concept of an eco system
 - Structure and function of an eco system.
 - Producers, consumers, decomposers.
 - Energy flow in the eco systems.
 - Ecological succession.
 - Food chains, food webs and ecological pyramids.
-
- Introduction, types, characteristic features, structure and function of the following eco systems:
 - Forest ecosystem

- Grass land ecosystem
- Desert ecosystem.
- Aquatic eco systems (ponds, streams, lakes, rivers, oceans, estuaries)

UNIT 4: Environmental Pollution

(10)

Definition Causes, effects and control measures of:

- Air pollution
- Water pollution
- Soil pollution
- Marine pollution
- Noise pollution
- Thermal pollution
- Nuclear hazards
- Solid waste Management: Nature of wastes, Disposal methods, waste-to-energy, Industrial wastes
- Role of an individual in prevention of pollution
- Pollution case studies

UNIT 5: Social issues and the Environment

(11)

- Water conservation, rain water harvesting, water shed management
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies.
- Wasteland reclamation
- Environment protection Act
- Air (prevention and control of pollution) Act
- Water (prevention and control of pollution) Act
- HIV / AIDS
- Threats to the Indian Biodiversity and its conservation
- Disaster management: Floods, earth quake, cyclone and land slides
- Role of Organic farming, bio-fertilizers and bio-pesticides in environment protection.
- Green Building Technology

UNIT 6: Sustainable Resource Development

(03)

- From Unsustainable to Sustainable Development
- Environment Impact Assessment (EIA) definition and benefits of EIA
- Elements for preparing EIA statements

UNIT 7: Field Work

(05)

- Form a group of students and do a work for social cause eg tree plantation, blood donation, environment protection, camps on awareness like importance of cleanliness in village area, awareness on HIV/AIDS, Environment and human health, Women and Child Welfare etc. (field work equal to 5 lecture works)

Recommended Books:

1. Fundamental concepts in Environmental Studies, D D Mishra, S Chand & Co Ltd
2. Environmental Science by Deswal and Deswal, Dhanpat Rai and Sons Ltd.
3. Handbook of Organic farming by P.D.Gera, Abhishek Publications, New Delhi.
4. Environmental studies by Daniel, Wiley India
5. M Ajni Reddy, Text book of Environmental Science, BS Publication, Hyderabad

Topic No.	Time Allotted For Lectures (Periods)	Marks Allotted %
1	02	10
2	13	20
3	04	10
4	10	20
5	11	25
6	03	10
7	05	05
Total	48	100

2.6 ENGINEERING GRAPHICS- II

L T P

Periods/Week - - 8

RATIONALE

Engineering Graphics is said to be the language of engineers and technicians. Reading and interpreting Engineering Graphics 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 graphics, their reading and interpretation

- Note: 1. First angle projection is to be followed
2. Minimum of 15 sheets to be prepared by each student
3. SP 46 – 1988 should be followed
4. Instructions relevant to various drawings may be given along with appropriate demonstration, before assigning drawing practice to the Students

DETAILED CONTENTS

Unit 1 Introduction of Section of Solids – 12hrs/15marks

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 – 12hrs/15marks

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 and Truncated Pyramids and Cones and their Application Such as Tray, Funnel, Chimney, Pipe Bends etc. (03sheets)

Unit 3 Threads (03 sheets) 12hrs/15marks

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) 09hrs/10marks

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) 09hrs/10marks

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) 12hrs/20marks

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) 15hrs/15marks

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

Unit -8 QCAD Window (for Practical's and viva only) 15hrs

Drawing Lines- Point Line, Point Line Extended, Line From an Angle, Horizontal Line, Vertical Line, 2-Point Rectangle, Rectangle with Dimensions, Angle Bisector, Parallel Line , with Distance, Parallel Line thru a Point, Line Tangent to Point and Circle or Arc, Line Tangent to 2-Circles or Arcs, Line from Relative Angle, Orthogonal Line, Polygon Centre and Point, Polygon 2-Points. Modify Tools- Move Tool, Rotate Tool, Scale Tool, Mirror Tool, Move and Rotate Tool, Rotate Tool, Trim Tool, Trim Both Tool, Lengthen and Shorten Tool, Stretch Tool, Clip to Rectangle Tool. Text Tools- Text Size and Layers, Text Tool Window, Complex Text in Dimensions, Edit Text with Property Editor.

Block- Insert Block, Modify Block Insertion Parameters, Replicate Block in Drawing with, Modify Tool, Block Configure Menu, Where is Block Stored, Create and Edit a Block

Create Empty Block.

RECOMMENDED BOOKS

- 1 Engineering Drawing by C M Verma, Takniki Parkashak, Roorkee. .
2. Elementary Engineering Drawing by ND Bhatt, Charotar Publishing House
3. A Text Book of Engineering Drawing by Surjit Singh, Dhanpat Rai and Co. Delhi
4. Engineering Drawing by PS Gill, SK Kataria and Sons, New Delhi
5. Machine Drawing by RB Gupta, Satya Prakashan, New Delhi.

1.7 GENERAL WORKSHOP PRACTICE – II

L T P

Periods/Week: 8

RATIONALE

The student will be able to know basic workshop processes. Read and interpret job drawings. Identify, select and use various marking, measuring, and holding, striking and cutting tools & equipments wood working and sheet metal shops. Operate, control different machines and equipments. Select proper welding rods and fluxes. Produce jobs as per specified dimensions. Adopt safety practices while working on various machines.

DETAILED CONTENTS (PRACTICALS)

Note: The students are supposed to come in proper workshop dress prescribed by the institute. Wearing shoes in the workshop(s) is compulsory. Importance of safety and cleanliness, safety measures and upkeep of tools, equipment and environment in each of the following shops should be explained and practiced. The students should prepare sketches of various tools/jobs in their practical Notebook.

COURSE CONTENT

- 1 **SHEET METAL SHOP**
 - 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., M.S.rivets, and aluminum rivet etc.
 - 1.5 Understand foil, sheet and plate.
 - 1.6 Tools used:-
 - 1.7 Different snips, shears, stacks, latter punch, figure punch, Solid punch,

hollow punch, mallet, soft

hammers, channel, Square bars, std. Sheet gauge.

1.8 Type of joints and operations: -

1.9 Introduction of various sheet metal operations & joints e.g. seaming, single seam, double seam,

Grooved seam, corner joint, cap joint etc.

1.10 Preparation of job (any two): - Open tray, cylinder, prism, Funnel etc.

1.11 Choose correct shape & size of sheet for a given job drawing considering allowances for joint or seam.

1.12 Do marking as per drawing using correct method, tools and sequence.

1.13 Identify correct operation e.g. shearing, punching, bending, debarring, folding, strengthening, stamping, riveting, etc.

1.14 Select appropriate Tool, inspection & measuring Instruments.

1.15 Holding the job in correct position.

1.16 Perform the operation with appropriate body posture, method & precision, exercising personal

Judgment of need of the force.

1.17 Inspect for proper joint quality and take remedial steps.

2 **WELDING SHOP**

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**

3.1 Understand the function of black smithy & forging shop

3.2 Layout of Shop

3.3 Sketch & Label Details of shop lay out

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**

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**

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

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

5.3 Production of any product on bench molding m/c

RECOMMENDED BOOKS

1. Workshop Technology I,II,III, by S K Hajra, Choudhary and A K Chaoudhary. Media Promoters and Publishers Pvt. Ltd., Bombay
2. Workshop Technology by Manchanda Vol. I,II,III India Publishing House, Jalandhar.
3. Manual on Workshop Practice by K Venkata Reddy, KL Narayana et al; MacMillan India Ltd. New Delhi
4. Basic Workshop Practice Manual by T Jeyapoovan; Vikas Publishing House (P) Ltd., New Delhi

5. Workshop Technology by B.S. Raghuwanshi, Dhanpat Rai and Co., New Delhi
6. Workshop Technology by HS Bawa, Tata McGraw Hill Publishers, New Delhi.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	30	15
2	30	15
3	25	10
4	25	05
5	18	05
Total	128	50