Rules And Guidelines For The Students

1. THE PROGRAMME

The Diploma in engineering course is a regular three year (Six Semester) full time programme.

2. ELIGIBILITY FOR ADMISSION

A candidate seeking admission to the first year of the Diploma in engineering course shall be required to have passed secondary examination from Rajasthan Board or any board recognized by Rajasthan Board of Secondary Education, Rajasthan with at least 45% marks in aggregate for general category candidates, and 40% for SC/ST/OBC candidates.

3. ADMISSION PROCEDURE

Admission to the first year Diploma in engineering course shall be made on the merit basis.

4. COURSE STRUCTURE

The teaching consists of Theory (Lectures and Tutorials) and Practicals (Laboratory work, Engineering Graphics, Workshop Practice and Project etc.). Examination will be held at the end of the each semester.

5. PROGRAMME ADMINISTRATION

5.1. Medium of Instruction

English/Hindi shall be the medium of instruction and examination.

5.2. Evaluation

(a) Each theory subject will be evaluated through a theory paper at the end of each semester carrying 35 marks along with continuous evaluation of sessional work (internal assessment), carrying 15 marks. The theory paper shall be of three hour duration. The sessional work will consist of continuous assessment of student's performance by teachers in tutorial classes, and class tests.

(b) Each practical subject will be evaluated through a practical examination at the end of each semester carrying 35 marks along with continuous evaluation of sessional work (internal assessment), carrying 15 marks. The sessional work will consist of continuous assessment of student's performance by teachers in practical classes.

(c) Three class tests will be organized in each semester as per the scheme. The higher two out of the marks scored in the three tests will be considered for the sessional marks along with marks secured in group evaluation system.

(d) Marks of sessional practical work will be evaluated by continuous assessment throughout the semester along with marks secured in group evaluation system.

(e) Marks of skill will be assessed throughout the semester by in-charge of that skill.

(f) Marks of discipline and extracurricular activity will be evaluated by student's performance, discipline, attendance in theory/practical classes and participation in assigned activities.

5.3. Promotion

(a) The maximum span period of a program is six years from the date of registration in the program.

(b) The minimum marks for passing the examination for each semester shall be 40% (P letter Grade) for subjects (theory and practical) of the semester. If student fails to achieve minimum marks to pass, credits of that subject(s) will not be considered for CGPA/SGPA. Student will have to achieve these credits in backlog paper(s) along with the regular examination of that semester.

(c) A student will be permitted to attend the classes of the second semester immediately after the examination of the first semester's examination, as the case may be, provided he/she has appeared in the first examination.

(d) To be eligible for promotion to the 3rd semester of the program a student must have successfully cleared at least 50% subjects out of the total subjects including practicals of the first and second semesters taken together.

(e) A student promoted to the third semester, without having cleared all the papers, will have to appear and pass the backlog papers of the first semester along with the regular examination of the first semester and backlog papers of the second semester along with the regular examination of the second semester. The candidate will have to pay the requisite examination fee in order to be eligible for re-examination

6. AWARD OF GRADE:

6.1. Credit Based Semester System (CBSS): Under the CBSS, the requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.

6.2. **Credit Point**: It is the product of grade point and number of credits for a course.

6.3. **Credit**: A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one hour of teaching (lecture or tutorial) or two hours of practical work/field work per week.

6.4. **Cumulative Grade Point Average (CGPA)**: It is a measure of overall cumulative performance of a student over all the semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.

6.5. **Grade Point**: It is a numerical weight allotted to each letter grade on a 10-point scale.

6.6. **Letter Grade:** It is an index of the performance of students in a said course/semester/programme. Grades are denoted by letters O, A+, A, B+, B, C, P and F.

Letter Grade	% Scale	Grade Point
O (Outstanding)	90% and Above	10
A+(Excellent)	80% to 89.99%	9
A(Very Good)	70% to 79.99%	8
B+(Good)	55% to 69.99%	7
B(Above Average)	50% to 54.99%	6
C(Average)	45% to 49.99%	5
P (Pass)	40% to 44.99%	4
F(Fail)	Less than 40%	0
Ab (Absent)	Absent	0

6.7. **Semester Grade Point Average (SGPA)**: It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.

6.8. **Semester**: Each semester will consist of 15-18 weeks of academic work equivalent to 90 teaching days. The odd semester may be scheduled from July to December and even semester from January to June.

6.9. **Transcript or Grade Card or Certificate:** Based on the grades earned, a grade certificate shall be issued to all the registered students after every semester. The grade certificate

will display the course details (code, title, credit points, grade secured) along with SGPA of that semester and CGPA earned till that semester.

7. ATTENDANCE

All students are required to have 75% attendance in each subject and there must be 75% attendance of the student before he/she could be permitted to appear in the examination.

TEACHING & EXAMINATION SCHEME

For Diploma in Engineering – Three Year (6 Semester) Full Time Diploma Programme

Diploma in Engineering – First Year (common for all Branches) **Semester – I**

Subject Code	Title		Hrs./Week			Credit		Total Credit	IA		Exam		Total
			L	T	P	Th	P		Th	P	Th	P	
DE 101 & 101 (P)	ENGLISH		3	-	2	3	1	4	15	15	35	35	100
DE 102 & 102 (P)	APPLIED PHYSICS-I		3	-	2	3	1	4	15	15	35	35	100
DE 103 & 103 (P)	APPLIED CHEMISTRY-I		3	-	2	3	1	4	15	15	35	35	100
DE 104	APPLIED MATHEMATICS-I		3	-	-	3	-	3	15	-	35	-	50
DE 105 & 105 (P)	COMPUTER & INFORMATION TECHNOLOGY FUNDAMENTALS		3	-	2	3	1	4	15	15	35	35	100
DE 106 & 106 (P)	ENGINEERING DRAWING-I		3	-	2	3	1	4	15	15	35	35	100
DE 107 (P)	ELECTRICAL & ELECTRONICS WORKSHOP		-	-	2	-	1	1	-	15	-	35	50
DE 108	CHETNA VIKAS MULYA SHIKSHA		3	-	-	3	-	3	15	-	35	-	50
DE 109	SKILL ASSESSMENT	AGRICULTURE SKILLS						1					10
		DAIRY SKILLS						1					10
		GENERAL SKILLS						1					10
DE 110	SEMINAR							1					10
De 111	DISCIPLINE & EXTRA CURRICULAR ACTIVITY							1					10
	Total		**21**	**-**	**12**			**32**					**700**

IA- Internal Assessment **T- Tutorial**

L- Lecture **P- Practical**

Th- Theory

TEACHING & EXAMINATION SCHEME

For Diploma in Engineering – Three Year (6 Semester) Full Time Diploma Programme

Diploma in Engineering – First Year (common for all Branches) **Semester – II**

Subject Code	Title		Hrs./Week			Credit		Total Credit	IA		Exam		Total
			L	T	P	Th	P		Th	P	Th	P	
DE 201 & 201 (P)	APPLIED MECHANICS		3	-	2	3	1	4	15	15	35	35	100
DE 202 & 202 (P)	APPLIED PHYSICS- II		3	-	2	3	1	4	15	15	35	35	100
DE 203 & 203 (P)	APPLIED CHEMISTRY- II		3	-	2	3	1	4	15	15	35	35	100
DE 204	APPLIED MATHEMATICS-II		3	-	-	3	-	3	15	-	35	-	50
DE 205 & 205 (P)	ENGINEERING DRAWING-II		3	-	2	3	1	4	15	15	35	35	100
DE 206	ENVIRONMENTAL STUDIES & DISASTER MANAGEMENT		3	-	-	3	-	3	15	-	35	-	50
DE 207 (P)	WORKSHOP PRACTICE		-	-	2	-	1	1	-	15	-	35	50
DE 208	CHETNA VIKAS MULYA SHIKSHA		3	-	-	3	-	3	15	-	35	-	50
DE 209	SKILL ASSESSMENT	AGRICULTURE SKILLS						1					10
		DAIRY SKILLS						1					10
		GENERAL SKILLS						1					10
DE 210	SEMINAR							1					10
DE 211	DISCIPLINE & EXTRA CURRICULAR ACTIVITY							1					10
	Total		**21**	**-**	**10**			**31**					**650**

IA- Internal Assessment **T- Tutorial**

L- Lecture **P- Practical**

Th- Theory

Diploma in Engineering First Year Syllabus

(Common for all Branches)
Semester I

DE101 ENGLISH

Unit I

General: Narration, Voice, Basic Sentence Patterns. (Nine basic **5** sentence patterns)**,** Transformation of Sentences, Determiners and Preposition, Tenses, Prefix, Suffix, Parts Of Speech-Common errors (Noun, Pronoun, Articles, Adverb, Punctuation, Preposition etc.)

Unit II

Modals: Modals in Conversational Usage, **Modals-** Can, Could, Should , Will, Would, May, Might, Must, Need not, Dare not, Ought to, Used to

Unit III

Phrases: At all; In stead of; In Spite of; As well as; Set up; Up set; Look up; Call off; Call out; Come across; Set right; Look other.

Unit IV

Idioms: Work up (excite); Break down; Stand up for; Turn down; Pass away; Pass on; Back up; Back out; Carry out; Done for (ruined); Bring about; Go through; Ran over; Look up (improve); Pick out (selected).

Unit V

Composition and Writing Skills: Unseen Passage, Precise Writing, Letter Writing, Paragraph Writing, Report Writing, Essay Writing - Essays on general and local topics related to environmental problems.

Reference Books:

1. Intermediate English Grammar Raymond Murphy, Foundation Books, New Delhi
2. Eng. Grammar, usage & Composition Tickoo & Subramanian, S.Chand and Co.
3. Living Eng. Structure Stannard Alien. Longman
4. A Practical Eng. Grammar Thomson and Martinet.(and its Exercise Books) ELBS
5. High School English Grammar, Wren & Martin and Composition

DE101-P COMMUNICATION SKILLS

Unit I

We envisage two successive stages for attaining skill in communication ability;

1. Listening **2. Speaking**

Listening: Listen to Prerecorded Tapes**,** Reproduce vocally what has been heard**,** Reproduce in Written form**,** Summarise the text heard**,** Suggest Substitution of Words and Sentences**,** Answer Questions related to the taped text**,** Summarise in Writing

Speaking: Introducing English consonant-sounds and vowel-sounds, Remedial exercises where necessary**,** Knowing Word stress**,** Shifting word stress in poly-syllabic words [For pronunciation practice read aloud a para or page regularly while others monitor]

Unit II

Vocabulary: Synonyms. Homonyms. Antonyms and Homophones**,** Words often confused, as for example,[I-me; your-yours; its-it's; comprehensible-comprehensive; complement-compliment]**,** Context-based meanings of the words, for example, man[N] man[vb]; step[|N| ,step[vb]**,** conflict _____Israel Palestinian conflict, Emotional conflict, Ideas conflict**,** learn ——— 1 learn at this school**,** I learnt from the morning news

Unit III

Delivering Short Discourses: About oneself**,** Describing a Place, Person, Object**,** Describing a Picture, Photo.

Unit IV

Group Discussion: Developing skill to initiate a discussion [How to open]**,** Snatching initiative from others [Watch for weak points, etc.]

Unit V

Expand a topic-sentence into 4-5 sentence narrative.

DE 102 APPLIED PHYSICS-I

Unit I

Units and Dimensions : Idea of various systems of units**,** SI units - Basic, Supplementary and Derived Units, Prefixes & Symbols, Dimensions and Dimensional Formulae, Principle of Homogeneity of Dimension,, Dimensional Analysis**,** Applications and Limitations.

Unit II

Elasticity: Stress and Strain**,** Elastic Limit & Hooke's law**,** Young's Modulus, Bulk Modules & Modulus of Rigidity, Poisson's Ratio.

Properties of Liquids: Surface Tension & Surface Energy**,** Cohesive & Adhesive Force**,** Angle of Contact, Capillarity & Expression for Surface Tension Streamline & Turbulent Flow**,** Reynold Number, Viscosity & Coefficient of Viscosity**,** Stoke's law & Terminal Velocity.

Unit III

Electrostatics: Coulomb's Law**,** Intensity of Electric Field, Intensity due to a Point Charge**,** Electric Lines of Forces & Electric Flux**,** Electric Potential, Electric Potential due to a Point Charge.

Unit IV

Transfer of Heat: Modes of Transmission of Heat - Idea of Conduction, Convection & Radiation**,** Thermal Conductivity & Coefficient of Thermal Conductivity**,** Black Body**,** Kirchoff's Laws & Stefan Boltzmann Law (statement only), Newton's Law of Cooling & its Derivation from Stefan's Law. Gas laws, specific heat of gases

Unit V

Optics

Reflection, refraction, snell's law, physical significance of refractive index, definition of dispersion, polarization and diffraction of light along with ray diagram, principle of superposition of waves, interference of light, constructive and destructive interference.

Reference Books:

1. Engineering Physics — Gaur & Gupta
2. Applied Physics Vol.-I — Hari Harlal, NITTTR
3. Applied Physics Vol.-II — Hari Harlal, NITTTR
4. A Text Book of Applied Physics — N.S. Kumar
5. Principles of Physics — Brijlal, Subhramanyam

DE102-P APPLIED PHYSICS LAB- I

1. To Measure Internal Diameter, External Diameter and Depth of a Calorimeter using Vernier Callipers.
2. To Measure Density of a Wire using Screw gauge
3. To Measure Radius of Curvature of a Lens, Mirror using Spherometer.
4. To Determine Refractive Index of Glass using Prism.
5. To Determine the Refractive Index of Glass using Travelling Microscope
6. To Determine Focal Length of a Convex Lens by Displacement Method.
7. To Determine Young's Modulus of Elasticity using Searle's Apparatus.
8. To Determine Acceleration due to Gravity using Simple Pendulum 9. To Determine the Velocity of Sound at O0c using Resonance Tube.
10. To Verify Newton's Law of Cooling.

DE103 APPLIED CHEMISTRY-I

Unit I

Atomic Structure and Periodic Table: Constituents of the Atom**,** Bohr's Model of the Atom**,** Quantum Number and Electronic Energy Levels**,** Aufbau's Principle, Pauli's Exclusion Principle, Hund's Rule, *n + l* Rule**,** Electronic Configuration of Elements (s, p, d Block Elements)**,** Development of Periodic Table- Modern Periodic Law, Long form of Periodic Table, Study of Periodicity in Physical and Chemical Properties with**** special reference to - Atomic and Ionic Radii, Ionisation Potential. Electron Affinity, Electronegativity, Variation of Effective Nuclear Charge in a Period, Metallic Character.

Unit II

Metals and Alloys: General Principles and Terms listed in Metallurgy**,** Metallurgy of Iron and Steel**,** Different forms of Iron**,** Effect of Impurities on Iron and Steel**,** Effect of Alloying Elements in Steel**, Corrosion**-Definition**,** Theories of Corrosion- Acid Theory (Rusting)**,** Direct Chemical Corrosion or Dry Corrosion**,** Wet Corrosion or Electro-Chemical Corrosion (Galvanic and Concentration Cell Corrosion)**,** Various Methods for Protection from Corrosion

Unit III

Electro Chemistry: Ionisation, Degree of Ionisation, Factors which Influence Degree of Ionisation, Hydrolysis – Degree of Hydrolysis, Hydrolysis Constant.**,** pH Value**,** Buffer Solution**,** Electrolysis, Faraday's Laws of Electrolysis

Unit IV

Fuels: Definition, Classification**,** Calorific Value (HCV and LCV) and Numerical Problems on Calorific Value**,** Combustion of Fuels, Numerical Problems on Combustion**,** Solid Fuels - Coal and Coke, Liquid Fuels- Petroleum and its Distillation, Cracking, Octane and Cetane Values of Liquid Fuels, Synthetic Petrol, Power Alcohol, Bio-Gas, Nuclear Fuels – Introduction to Fission and Fusion Reactions.

Unit V

Kinetic Theory of Gases: Postulates of kinetic Theory**,** Ideal Gas Equation, Pressure and Volume Corrections, Vender Walls Equations**,** Liquefaction of Gases, Critical Pressure and Critical Temperature for Liquefaction, Liquefaction of Gases by Joule – Thomson Effect, Claude's Method and Linde's Method

Reference Books:

1. Engineering Chemistry II (Hindi)	Mathur and Agarwal
2. Chemistry of Engineering Materials	C.V. Agarwal
3. Engineering Chemistry	P.C. Jain and Monika
4. Engineering Chemistry	M.M. Uppal
5. Engineering Chemistry	V.P.Mehta Jain Bros. Jodhpur
6. Practical Chemistry for Engineers	Virendra Singh
7. Hand book of Technical Analysis	Bannerji Jain Bros.Jodhpur
8. Engineering Chemistry-I(Hindi)	Mathur & Agrawal.
9. Inorganic Chemistry	Shivhare & Lavania.

10. Organic Chemistry Kumar & Mehnot

DE103-P APPLIED CHEMISTRY LAB- I

1. Identification of Acid and Basic Radicals in a Salt (Total Numbers = 5)
2. Analysis of a Mixture Containing Two Salts (Not Containing Interfacing Radicals). (Total Numbers = 5)
3. Determination of Percentage Purity of an Acid by Titration with Standard Acid.
4. Determination of Percentage Purity of a Base by Titration with Standard Alkali Solution.
5. Determination of the Strength of Ferrous Sulphate using Standard Ferrous Ammonium Sulphate and Potassium Dichromate as Intermediate Solution
6. Determination of the Strength of Ferrous Sulfate Solution using Standard Solution of Thiosulphate.
7. Determination of the Strength of Copper Sulphate Solution using a Standard Solution of thio Sulphate.
8. Determination of pH Values of Given Samples.

DE104 APPLIED MATHEMATICS- I

Unit I

Matrices and Determinants: Definition and Properties of Determinants, Definition and Types of Matrix, Transpose of a Matrix, Symmetric, Skew Symmetric Matrices, Orthogonal matrices, Hermitian and Skew Hermitian, Minors and Cofactors, Adjoint and Inverse of a Matrix, Cramer's Rule.

Unit II

Introduction to Different Types of Expansion: Factorial Notation, Meaning of C(n, r), P(n, r), Binomial Theorem for Positive Index. Complex number: Definition of Complex Number, Operations on Complex Number (Add., Sub., Multiplication, Division), Conjugate Complex Number, Modulus and Amplitude of a Complex Number, Polar form of a Complex Number, Basic of exponential and Logarithmic functions.

Unit III

Trigonometry: Allied Angle(sin (180±A), sin (90±A) etc., Sum and Difference Formula (without proof) and their Application, Product Formula and C-D Formula, T-Ratios of Multiple and Sub-Multiple Angles (2A, 3A, A/2), Solution of Trigonometric Equations : sin X = 0, tan X = 0, cos X = 0, sin X=A, cos X =A & tan x = A, inverse trigonometry.

Unit IV

Vector Algebra: Definition, Addition and Subtraction of Vectors, Scalar and Vector Product of two Vectors, Scalar Triple Product and Vector Triple Product, Applications of Vectors in Engineering Problems.

Unit V

Two Dimensional Coordinate Geometry: General Introduction, Distance Formula and Ratio Formula, Co-ordinate of Centroid, In-Centre, Ortho-Centre and Ex-Centre of a Triangle, Area of Triangle, Straight Line, Slope form, Intercept form, Perpendicular form, One Point Slope form, Two Point form & General form, Angle between Two Lines, Perpendicular Distance of a Line from a Point

Reference Books:

1. Mathematics XI & XII NCERT, New Delhi
2. Mathematics XI & XII Rajasthan Board, Ajmer
3. Polytechnic Mathematics H. K. Dass

DE105 COMPUTER AND INFORMATION TECHNOLOGY FUNDAMENTALS

Unit I

Introduction: Computer: An Introduction**,** Generation of Computers & its type, Data Representation**,** Number System & their Conversions**,** Arithmetic Operations, 1s , 2s Compliment**,** Coding Technique, Idea of- Hardware**,** Software**,** Firmware**,** Free ware**,** Human ware**,** Computer Languages and Translators, Central Processing Unit (CPU)**,** Memory Unit**,** Input/ Out Devices, Block Diagram Showing Interconnection of Computer Parts**,** Definition of Operating System (OS)**,** Types of OS**,** Single user**,**Multi user**,** Multi Programming**,** Time Sharing**,** Multi Processing,

Unit II

Introduction to Windows XP: Introduction to Windows Environment**,** Parts of Windows Screen**,** Icon, Menu, Start Menu**,** Minimising, Maximising, Closing Windows**,** Windows Explorer, Recycle Bin, Clipboard, My Computer, My Network Places**,** Control Panel : Adding New Hardware and Software, Display, Font, Multimedia, Mouse, International System**,** Accessories: Paint, Media Player, Scan disk, System Information

Unit III

Information Processing Using Microsoft Office: Word processor, Introduction to MS-Word, Introduction to Macro, Electronic Spread Sheet, Introduction to MS-Excel, Working with Spread Sheet, Power Point-Introduction to Power Point, Creating a Presentation/Slide, Adding Animation in Slide, Running a Slide Show

Unit IV

Computer and Communication: Need of Data Transmission**,** Data Transmission Media**,** Baud rate and Bandwidth, Digital and Analog Transmission, Serial and Parallel Data Transfer, Protocols, MODEM, Networking of Computers, Topologies: Bus, Star, Ring, Hybrid**,** Introduction to Ports : RS232, IEEE 488, PS2, USB, UTP**,** Introduction to Internet**,** Bridges, Routers, Switch, Gate way**,** www, Web Site, URL**,** e-mail, e-Commerce**,** Web browsing, Web page**,** Introduction to Hyper text & HTML**,** Introduction to http & ftp Protocol

Unit V

Information Concepts and Processing: Definition of Data, Information**,** Need of Information**,** Quality of Information**,** Concepts of Data Security, Privacy, Protection**,** Computer Virus and their types**,** Scanning & Removing Virus

Reference Books:

1. Computer Fundamental — V.K. Jain, Standard Pub. & Distributors
2. PC Software for Windows made simple — R.K. Taxali, TMH
3. BPB Computer Course — BPB Editorial Board, BPB in Hindi
4. First Course in Computer Science — Sanjeev Saxena, Vikas Publishing House

DE105-P COMPUTER AND INFORMATION TECHNOLOGY FUNDAMENTALS LAB

1. Study of Computer Components
2. Practice of Computer Booting Process in XP
3. Demonstration of Windows Environment
4. Practice of using My Computer, Windows Explorer
5. Practice of using Control Panel
6. Practice of My Network Places
7. Practice of CD and DVD Writing
8. Practice of Paint
9. Installation of Windows XP by using NTFS File System.
10. Demonstration of Network
11. Visit to Internet Site
12. Creating e-mail Account, Sending and Receiving e-mails.
13. Sending e-mail with Attachment & Signature
14. Searching Web Page/ Site using Search Engine: (eg. google.com, yahoo.com, altavista.com etc.)
15. Exercise Based on MS-Word: Document Preparation, Printing Document, Mail Merge usage, Draw Table
16. Exercise Based on Ms-Excel: Work Book Preparation, Printing Workbook, Data-base usage, Draw Charts
17. Exercise Based on Power Point: Creating Slide, Adding, Animations in Slide, Running Slide
18. Creating Simple Web Page using HTML.

DE106 ENGINEERING DRAWING-I

Unit I

Introduction of Drawing Instruments: Types of Line, Lettering – Single Stroke, Italics**,** Various Systems of Placing the Dimensions, Type of Scales (Reducing and Enlarging)**,** Representative Fraction**,** Plain and Diagonal Scales

Introduction to drawing software.

Unit II

Geometrical Construction and Engineering Curves: Regular Polygons of Given Side**,** Conic sections – Construction of Ellipse, Parabola, Hyperbola, Construction of cycloid, epicycloid, hypocycloid, involute, archimedian spiral, cylindrical helix

Introduction to solid

Introduction to 3D drawing software

Unit III

Section of Solids and Development of Surfaces: Introduction of Sectional Planes**,** Sectional Plane Perpendicular to one Reference Plane and Parallel to other**,** Sectional Plane Perpendicular to one and Inclined to other, Section of all types of Geometrical Solids. viz, Prism, Pyramid, Cone and Cylinder, Apparent Section and True Section

Introduction to auto cad for development

Development of Surfaces of Regular Solids viz, Prism, Pyramid, Cone and Cylinder, Sectional Plan, Sectional Elevation and Sectional Side View and Development of Surface of Solid after Section, Conventional Method of Representing Full, Half, Removed, Revolved, Partial and Offset Section,

Materials used in engineering

Section Lines for Different Material as per ISI Recommendations.

Introduction to isometric and orthographic views.

Unit IV

Keys and Pulleys: Drawing and uses of Various Types of Keys - Saddle Key - Hollow and Flat, Sunk - Rectangular, Square, Key with Gib Head, Woodruff Key**,** Pulley - Straight Arms flat Belt Pulley, V-Belt Pulley**,** Shaft Couplings, Muff Coupling**,** Protected Type Flange Coupling, Simple Bush Bearing.

Unit V

Screw Threads and Fasteners: Classification of Threads**,** Profiles and uses of - Metric, BSW, Square, ACME, Knuckle, Sellers Threads**,** Machine Screw – Fillister, Flat Counter Sunk, Rounded Counter Sunk, Cup and Socket, Set Screws – Oval, Conical, Flat and Cup Pointed Hexagonal Bolt and Nut, Stud and Collar Stud.

Reference Books:

1. Engineering Drawing — N D Bhatt
2. Machine Drawing — N D Bhatt
3. Engineering Graphics — V. Laxmi Narayan

4. Machine Drawing	V. Laxmi Narayan
5. Engineering Drawing	P S Gill
6. Machine Drawing	M L Mathur
7. Engineering Drawing (Hindi)	B K Goyal
8. Mechanical Engineering Drawing (Hindi)	Gupta & Kumar
9. Engineering Drawing	A C Parkinson

DE106-P ENGINEERING DRAWING LAB-I

1. Preparation of following on Imperial Size Drawing Sheet:- Lines, Letters and Scales, Geometrical Constructions and Engineering Curves, Section and Development of Surfaces of Solids i.e. Cone, Cylinder, Sphere etc.**,** Section and Development of Surfaces of Prism and Pyramids**,** Isometric Projections**,** Riveted Joints, Screw Threads and Fasteners, Pulleys, Couplings, Bearing

2. Preparation of following Drawings in Sketch Book (Home Assignment): Lettering (On Graph Sheet)**,** Section and Conventions**,** Set Screws**,** Machine Screws**,** Foundation Bolts, Keys

DE107-P ELECTRICAL & ELECTRONICS WORKSHOP

1. Study of Symbol, Specification and Approximate Cost of Common Electrical Accessories, Tools and Wires & Cables Required for Domestic Installation.
2. Identification of following Resistors and finding their Values-Carbon and Metal Film, Variable Resistance Log and Linear, Semi Variable Preset of One Turn & Multiturn.
3. Measurement of Voltage, Current and Resistance using Analog & Digital Multimeter
4. Study of:
   i) Basic Electricity Rules for a Domestic Consumer ii) Safety Precautions & use of Fire Fighting Equipments
   iii) Use of series of Phase Tester, Series Test Lamp, Tong Tester and Megger in Testing of Electrical Installation.
5. Measurement of Power and Energy Consumption byan Electric Heater using Watt Meter and Energy Meter.
4. Preparation of Wiring Diagram, Wiring, Testing, Fault Finding & Costing for:
   i) Control of one Lamp by one Switch (using Batten and Tumbler Switch) ii) Control of Stair Case Wiring (using Casing Capping, CFL and Flush Type Switches) iii) Control of one Bell Buzzer and Indicator by one Switch (using Conduit and Flush type Switch)
6. Study, Connecting, Testing and Fault Finding of
   i) Fluorescent Tube and its Accessories
   ii) Ceiling Fan with resistance type and Electronic Regulator
7. Identification of following Capacitor and finding their Values-Mica, Ceramic, Polysterene, Electrolytic, Tantalum
8. Identification and Testing of following type of Connectors-Rack and Panel, Printed Circuit Edge, Coaxial, Tape & Ribbon, Plate
9. Study of following Tools used in Electronic Workshop-Component Lead Cutter, Wire Strippers, Soldering Iron & Soldering Station, De-Solder Pump
10. Testing of Electronic, Component such as Capacitor, Inductor, Diode and Transistor.
11. Measurement of Amplitude & Frequency of a Signalusing CRO.
12. Verification of Ohm's law using Resistive Circuit and Analog Meters.
13. Soldering of different passive component combination on general purpose PCB.
14. Sketching of different Electronic Components Symbol on Drawing Sheet.

* Accessories used in all above Experiments must be According to Latest Technology.

Reference Books:

1. Electrical Workshop — M.L. Gupta
2. Domestic Devices & Appliances — K.B. Bhatia
3. Electrical Workshop — S.L. Uppal
4. Electrical Component & Shop Practice — K.R. Nahar

DE108 CHETNA VIKAS MULYA SHIKSHA

Paper: Introduction to Coexistence of Living

Unit I: Course Introduction - Need, Basic Guidelines, Content and Process for Value Education

1. Understanding the need, basic guidelines, content and process for Value Education & Right Understanding
2. Exploration or Study –what is it? - its content and process; 'Natural Acceptance' and Experiential Validation- as the mechanism for self exploration. Understanding of the process of Scrutiny, Observation & Survey.
3. Continuous Happiness and Prosperity- A look at basic Human Aspirations
4. Right understanding, Relationship and Physical Facilities- the basic requirements for fulfillment of aspirations of every human being with their correct priority
5. Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario, Method to fulfill the above human aspirations: understanding and living in harmony at various levels

Unit II: Understanding Harmony in the Human Being - Harmony in Myself

1 Understanding human being as a co-existence of the sentient 'Self' and the material 'Body'

2 Understanding the needs of Self (*'jeevan*') and 'Body' – Happiness *(sukh)* & Physical Facility *(bhoutik suvidha)*

3 Understanding the Body as an instrument of 'Self' (*'jeevan'* being the doer, seer and enjoyer)

4 Understanding the characteristics and activities of 'Self' *(jeevan)* and harmony in 'Self'

5 Understanding the harmony of 'Self' *(jeevan)* with the Body: Sanyam and Swasthya; correct appraisal of Physical needs, meaning of Prosperity in detail, Programs to ensure Regulation & Health [*Sanyam and Swasthya*]

Unit III Understanding Harmony in the Family - Harmony in Human-Human Relationship

1 Understanding harmony in the Family- the basic unit of human interaction

2 Understanding the 7 Universal human relationships: Husband-Wife, Son-Daughter, Brother-Sister, Friends, Teacher-Student, Colleague-Co-Worker & Organizational relationships

3 Understanding values in human-human relationship; meaning of Justice (*Nyaya)* and program for its fulfillment to ensure Mutual-fulfillment (*Ubhay-tripti)*;

4 Trust (*Vishwas*) and Respect (*Samman*) as the foundational values of relationship, Understanding the meaning of *Vishwas*; Difference between intention and competence, Understanding the meaning of *Samman*, Difference between respect and differentiation; the other salient values in relationship

5 Introduction to 9 established-values and 9 expressed values in Human Relationships

Unit IV - Understanding Harmony Society- Harmony in Social Relationship

1. Understanding the harmony in the society (society being an extension of family): Resolution, Prosperity, Trust and co-existence (*Samadhan*, *Samridhi*, *Abhay*, *Sah-astitva*) as comprehensive Human Goals
2. Understanding of the 5 dimensions of:
   Education-Right values
   a. Consciousness development based value education to ensure right understanding in every individual/child
   Health-Discipline
   b. For nurturing and maintaining the body
3. **Production-Work**
   a. Fulfill material needs of the family (producing in line with principles in nature)
   Exchange-Storage
   b. Fulfill Material needs (based on mutual fulfillment and not exploitation)
4. **Justice-Security**
   a. To protect 'human-ness' and enrichment of the entire Nature (co-existence with nature)

5. Visualizing a universal harmonious order in society- Undivided Society (*AkhandSamaj*), Universal Order (*SarvabhaumVyawastha*)- from family to world family!

Unit V: Understanding Harmony in Nature and Existence - Whole existence as Co-existence

1. Understanding the harmony and mutual relationship in the Nature: Material Order, Bio (*pranic*) Order, Animal Order and Human Order.
2. Complimentarily in natural Orders
3. Interconnectedness and mutual fulfillment among the four orders of nature-recyclability and self-regulation in nature
4. Understanding Existence as Co-existence (*Sah-astitva*) of mutually interacting units in all-pervasive space
5. Holistic perception of harmony at all levels of existence

Diploma First Year Syllabus

Semester II

DE201 APPLIED MECHANICS

Unit I

Force and Moment: Definition, Units, Different Types of Forces, Resolution of Forces, Law of Parallelogram of Forces, Resultant of two or more Forces, Basic Conditions of Equilibrium, Lami's Theorem (No Proof), Jib Crane, Law of Polygon of Forces (Only Statement), **Moment** Definition, Units & Sign Convention, Principle of Moments, Application of Equilibrium Conditions fornon-concurrent Forces, **Application of Principles of Forces & Moments:** Levers & their Types, Reactions of Simply Supported Beams (Graphical & Analytical Method), Steel Yard, Lever Safety Valve, Foundry Crane, **Simple Machines:** Basic Concepts, Loss in Friction, Inclined Plane, Simple & Differential Wheel and Axle (Neglecting Rope thickness), Screw Jack, Lifting Crabs, Systems of Pulleys, Worm and Worm Wheel

Unit II

Work, Power and Energy: Work Done by a Constant Force, Work Done by Uniform Variable Force, Power, Indicated Power, Brake Power, Efficiency, Power required for an Engine on Horizontaland Inclined (smooth and rough) Planes, Energy, Potential Energy, Kinetic Energy of Rectilinear Motion, Kinetic energy of Circular Motion

Unit III

Centre of Gravity: Concept, Centroid, Calculation of C.G. of Regular Bodies, Calculation of C.G. of Plain Geometrical Figures

Friction: Types of Friction, Laws of Friction, Angle of Friction, Angle of Repose, Friction on Horizontal and Inclined Plains, Application of Laws of Friction Related to Wedge, Ladder and Screw Jack.

Unit IV

Impact and Collision: Concept, Impulse and Impulsive Force, Law of Conservation of Momentum, Collision Between Two Rigid Bodies, Newton's Experimental Law of Collision, Coefficient of Restitution

Unit V

Motion: Circular Motion and Rectilinear Motion- Concept, Motion under Constant Velocity, Motion under Constant Acceleration, Relationship between Linear Velocity and Angular Velocity, Centrifugal and Centripetal Forces, their Applications**,** Velocity-time graph and its uses**,** Motion under Gravity, Newton's Laws of Motion, Projectiles

Reference Books:

1. Engineering Statics (in Hindi) — Gokhru & Soni
2. Applied Mechanics (in Hindi) — A. R. Paage
3. Applied Mechanics — I. B. Prasad
4. Engineering Mechanics — R.S. Khurmi

DE201-P APPLIED MECHANICS PRACTICAL

1. Use of Engineering Calculator.
2. Verification of the Law of Parallelogram and Polygon of Forces-By using Force Board, By using Force Table
3. Verification of the Principle of Moments in case of-Compound Lever, Bell crank Lever
4. Determination of Reactions in Case of Simply Supported Beams.
5. To Determine Coefficient of Friction between two Surfaces on- Horizontal Plane, Inclined Plane.
6. Determination of Mechanical Advantage, Velocity Ratio and Efficiency of Simple Wheel and Axle
7. Determination of Mechanical Advantage, Velocity Ratio and Efficiency of differential Wheel and Axle
8. Determination of Mechanical Advantage, Velocity Ratio and Efficiency of Single Purchase Crab
9. Determination of Mechanical Advantage, Velocity Ratio and Efficiency of Double Purchase Crab
10. Determination of Mechanical Advantage, Velocity Ratio and Efficiency of Worm and Worm Wheel
11. Determination of Mechanical Advantage, Velocity Ratio and Efficiency of Screw Jack
12. Determination of Mechanical Advantage, Velocity Ratio and Efficiency of First System of Pulleys
13. Determination of Mechanical Advantage, Velocity Ratio and Efficiency of Second System of Pulleys
14. Determination of Mechanical Advantage, Velocity Ratio and Efficiency of Third System of Pulleys.
15. Determination of Value of "g" by Simple Pendulum.

DE202 APPLIED PHYSICS-II

Unit I

D.C. Circuits and A.C. Circuits: Resistivity, Effect of Temperature on Resistance, Ohm's Law, Kirchoff's Law, Wheatstone Bridge, Meter Bridge, Principle of Potentiometer, Faraday's Laws of Electro Magnetic Induction, Lenz's Law, Self and Mutual Inductance, Alternating Current, Phase & Phase Difference, Instantaneous, Average and rms value of AC, Behaviour of Resistance, Capacitance and Inductance in an AC Circuit, AC Circuits Containing, R-L, R-C and LCR in Series, Power in AC Circuit and Power Factor, Choke Coil.

Unit II

Semi-Conductor Physics: Energy Bands in Conductor, Semi-Conductor & Insulator, Chemical Bonds in Semiconductor, Intrinsic and Extrinsic Semiconductors, PN-Junction Diode, Working, Biasing and Characteristics Curves, Zener Diode and Voltage Regulation using it, Half Wave & Full Wave Rectifiers (only working, no derivations), Transistors (basic idea)

Unit III

Sound Waves: Velocity of Sound Waves, Newton's Formula, Laplace Correction, Factors affecting Velocity of Sound Waves, Propagation of Progressive Wave, Displacement, Velocity and Acceleration of a particle during propagation of wave, Superposition of Waves, Stationary Waves (without mathematical analysis), Resonance tube.

Unit IV

Gravitation: Newton's law of Gravitation, Acceleration due to Gravity, Kepler's laws of Planetary Motion (statement only), Artificial Satellite (simple idea), Geo-Stationary Satellites, Escape Velocity, Velocity & Time Period of an Artificial Satellite.

Unit V

Modern and Nuclear Physics: Photo Electric Effect, Einstein's Equation, Lasers, Stimulated Emission and Population Inversion(basic idea), Types of Laser - Helium Neon and Ruby Laser, Application of Lasers (brief idea only), . **Nuclear Physics-** Idea of Nuclear Force, Mass - Defect and Binding Energy, Nuclear Reactions, Natural and Artificial Radioactivity, Law of Radioactive Disintegration, Half Life & Mean Life.

Reference Books:

1. Engineering Physics — Gaur & Gupta
2. Applied Physics Vol.-I — Hari Harlal, NITTTR
3. Applied Physics Vol.-II — Hari Harlal, NITTTR
4. A Text Book of Applied Physics — N.S. Kumar
5. Principles of Physics — Brijlal, Subhramanyam

DE202-P APPLIED PHYSICS PRACTICAL-II

1. To Verify Law of Resistances.
2. To Determine Specific Resistance of Material using Meter Bridge.
3. To Determine Internal Resistance of a Primary Cell using Potentiometer.
4. To Compare emf of two Primary Cells using a Potentiometer.
5. To Draw Characteristic Curves of PN Diode and Determine its Static and Dynamic Resistance.
6. To Draw Characteristic Curves of a PNP/NPN Transistor in CB/CE Configuration.

To Measure Resistance of a Galvanometer by Half-Deflection Method.

DE203 APPLIED CHEMISTRY-II

Unit I

Carbon Chemistry: Definition of Organic Chemistry, Difference between Organic and Inorganic Compounds, Classification and Nomenclature - Open Chain and Closed Chain Compounds, IUPAC System of Nomenclature. (upto C5).

Unit II

Polymers: Definition, Plastics- Classification, Constituents, Preparation, Properties and Uses of Polythene, Bakelite Terylene and Nylon, Rubber- Natural Rubber, Vulcanisalion, Synthetic Rubbers - Buna - N, Buna-S, Butyl and Neoprene

Unit III

Lubricants: Definition, Classification, Properties of Lubricants- Viscosity, Oiliness, Flash Point,Fire Point, Acid Value, Saponificatin, Emulsification, Cloud and Pour Point, Artificial Lubricants

Unit IV

Water: Sources of Water, Hardness of Water., Degree of Hardness, Estimation of Hardness by EDTA method, Problems on Calculation of Hardness, Disadvantages of Hardness, Softening Methods- Lime-Soda Method, Permutite Method, Ion -Exchange Method, Problems on Softening of Water, Drinking Water, its Requisites, Purification and Sterilization of Water, Water Pollution- Causes and Effects, Treatment of Industrial Water Discharges

Unit V

Miscellaneous Materials: Refractories -Definition, Classification and Properties, Abrasives : Natural and Synthetic Abrasives, Paint and Varnish- Definition and Function of Constituents, Soap and Detergents- Definition, Properties and Uses, **New Engineering Materials: (Brief Idea of Following):** Superconductors, Organic Electronic Materials, Fullerences, Optical Fibres, Manufacturing of Portland Cement, Chemistry of Setting and Hardening of Cement, Glass Preparation, its varieties and uses.

Reference Books:

1. Engineering Chemistry II (Hindi)	Mathur and Agarwal
2. Chemistry of Engineering Materials	C.V. Agarwal
3. Engineering Chemistry	P.C. Jain and Monika
4. Engineering Chemistry	M.M. Uppal
5. Engineering Chemistry	V.P.Mehta Jain Bros. Jodhpur
6. Practical Chemistry for Engineers	Virendra Singh
7. Hand book of Technical Analysis	Bannerji Jain Bros.Jodhpur
8. Engineering Chemistry-I(Hindi)	Mathur & Agrawal.
9. Inorganic Chemistry	Shivhare & Lavania.
10. Organic Chemistry	Kumar & Mehnot
11. Practical Engineering Chemistry	Dr Renu Gupta & Dr Sapana Dubey
12. A Text book of Engineering Chemistry	S. K. Jain & K. D. Gupta

DE203-P APPLIED CHEMISTRY PRACTICAL-II

1. Determination of Hardness of Water by EDTA Method.
2. Estimation of Free Chlorine in Water.
3. Determination of Acid Value of oil.
4. Preparation of Soap.

DE204 APPLIED MATHEMATICS- II

Unit I

Conic: Circle-Definition and Standard Equations, Equations of Tangent and Normal at a Point (simple problems), Parabola-Definition and Standard Equations, Equations of Tangent and Normal at a Point (Simple problems), Ellipse and Hyperbola-Definition and Standard Equation, Equations of Tangent and Normal at a Point (simple problems).

Unit II

Function: Definition of Function, Range and Domain of Function, Types of Function, Absolute Value Function, Exponential value Function, Identity Function, Reciprocal Function, Rational and Irrational Function, Increasing and decreasing Function, Limits, Concept of Limit, L.H.L., R.H.L., Limit of Standard Functions, Concept of Continuity and Differentiability at a Point (simple Problems)

Unit III

Differential Calculus: Standard Formulae (Except Hyperbolic Function), Derivative of Sum, difference, Multiplication and Division of two Functions, Differentiation of Function of a Function, Logarithmic Differentiation, Differentiation of Implicit Functions, Differentiation of Parametric Functions, Differentiation by Trigonometric Transformations, Differentiation of a Function w.r.t. Another Function, Second Order Derivative,

Unit IV

Integral Calculus- General Introduction of Integral Calculus, Integration of Sum and difference of Functions, Integration by Simplification, Integration by Substitution, Integration by Parts, Integration of Rational and Irrational Functions, Integration of Trigonometric Functions, Definite Integral and its Properties.

Unit V

Differential Equations: Definition of differential Equation. Order, Degree and Solution of a differential Equation, Solution of a differential Equation of First Order and First Degree using Variable Separable Method Homogenous Form, Reducible to Homogenous Form, Exact differential. Solution of Linear Differential Equation of Higher order with Constant Coefficients,

Reference Books:

1. Mathematics XI & XII NCERT, New Delhi
2. Mathematics XI & XII Rajasthan Board, Ajmer
3. Polytechnic Mathematics H. K. Dass
4. Text Book on Differential Calculus Chandrika Prasad
5. Text Book on Integral Calculus Chandrika Prasad

DE205 ENGINEERING DRAWING-II

Unit I

Foundation Bolt and Locking Devices: Drawing and uses of Rag, Lewis and Eye Bolt**.** Locking by Simple Lock Nut, Split Pin and Spring Washer, Castle Nut, Locking by Plate

Unit II

Rivets and Riveted Joints: Different Types of Rivets -Snap Head, Pan Head with Tapered Neck, Rounded Counter Sunk Head, Flat Counter Sunk Head, Lap Joint - Single Riveted, Double Riveted (Chain Riveting and Zigzag Riveting), Butt Joint - Single Riveted, Double Riveted Chain Riveting and Zigzag Riveting (using Single and Double Cover Plates)

Unit III

Projections: Introduction of Projections, Reference Planes and Projectors**,** Angle of Projections (First Angle and Third Angle Projections)**,** System of Rotations**,** Projection of Points in Different Quadrants**,** Projection of Lines Parallel to Both the Planes**,** Parallel to One and Perpendicular toOther Planes**,** Parallel to One and Inclined to Other Planes**,** Inclined to Both the Planes**,** True Length of a Line and its Apparent and True Inclinations**,** Projection of Triangular, Square, Rectangular, Pentagonal, Hexagonal and Circular Planes, Plane Parallel to One & Perpendicular to Other**,** Plane Perpendicular to Both the Planes, Plane Perpendicular to One and Inclined to Other Plane, Projection of Cube, Prism, Pyramid, Cylinder and Cone**,** Projection of Solid whose Axis is Perpendicular to One and Parallel to Other plane, Projection of Solid Whose Axis is Parallel to One and Inclined to Other Plane, Projection of Solid Whose Axis is Parallel to both the Planes (excluding inclined to both the planes), Conversion of Pictorial Views into Orthographic Views, Orthographic Projections of Simple Solid Object from Pictorial/Isometric view.

Unit IV

Isometric Projection: Isometric Axes, Isometric Scale, Isometric Lines and Isometric Planes, Isometric View and Isometric Projection of Plane (Square, Rectangular, Pentagonal Hexagonal, Circular), Isometric View and Isometric Projection of Prism, Pyramid, Cone, Cylinder, Sphere, their Frustum and Combination of these Solids

Unit V

Building Drawing: Introduction of Orientation and Sun Chart Diagram of Residential Building, Section of a Wall Including Foundation**,** Sectional Plan of One Room and Toilet from Given Sketch

Reference Books:

1. Engineering Drawing	N D Bhatt
2. Machine Drawing	N D Bhatt
3. Engineering Graphics	V. Laxmi Narayan
4. Machine Drawing	V. Laxmi Narayan
5. Engineering Drawing	P S Gill
6. Machine Drawing	M L Mathur

DE205-P ENGINEERING DRAWING PRACTICAL-II

1. Preparation of following on Imperial Size Drawing Sheet:- Projection of Lines, Projection of Planes**,** Projection of Solids, Orthographic Projections of Simple objects, Isometric Projections**,** Building Drawing

2. Preparation of following Drawings in Sketch Book (Home Assignment): Projection of Points In Different Quadrants**,** Isometric Projection of Various Planes**,** Various Types of Rivet Heads**,** Section and Conventions**,**

DE206 ENVIRONMENTAL STUDIES & DISASTER MANAGEMENT

UNIT - I

Do's and Don'ts for prevention of life and property due to earthquake, tsunami, cyclone fire, flood and landslides, Legislative responsibility and community base disaster management

UNIT - II

Introduction, General introduction to environment, biotic and abiotic environment Environmental pollution, Adverse effect of pollution n environment, control strategies Various acts and regulations for environmental protection

UNIT - III

Water Pollution

Surface and underground sources of water, Water quality standards, impurities in water and their removal, River water pollution, eutrophication of lakes Domestic waste water management,

Air Pollution

Sources of air pollution, adverse effects on human health, Greenhouse effect, global warming, acid rain, ozone depletion

Ecology

Basics of species, biodiversity, population dynamics, Energy flow, ecosystems, environmental impact assessment, Renewable sources of energy, Sustainable development

UNIT - IV

Introduction & Basic Concept of Disasters

Types of disasters and their brief introduction: Natural & Man made disasters , Earthquakes, tsunami, cyclone, flood, drought, landslide, Nuclear, Chemical, Fire and environmental hazards

UNIT - V

Disaster Management Cycle & its Components

Mitigation and prevention, preparedness, Response (rescue & relief), rehabilitation and recovery Disaster vulnerability & risk and its reduction, Maps showing earthquake, cyclone, flood and landslide hazards in India

DE207-P WORKSHOP PRACTICE

Unit I

Carpentry Shop Theory: Knowledge of Common Indian Timbers, Name, Functions, Material and Specifications of Common Hand Tools, Holding Tools, Cutting Tools, Measuring and Marking Tools used in Carpentry, Safety Measures, Introduction of Carpentry Joints and their relative Advantages and uses, Elementary Idea about the Wooden Polishing Work, Introduction to Various Carpentry Machine (Band Saw, Circular Saw, Wood Turning Lathe, Wood Planner)

Exercises:

1. Preparation of Cross-Half Lap Joint.
2. Preparation of Dovetail Joint
3. Preparation of Bridle Joint
4. Preparation of Mortise and Tenon Joint
5. Preparation of Mitre Joint
6. Demonstration of Job on Wooden Polishing Work

Unit II

Welding Shop Theory: Introduction to Welding and its Importance in Engineering Practices, Common Materials that can be Welded, Gas Welding Theory-Gas Welding Equipment, Adjustment of different types of Flames, Practice in Handling Gas Welding Equipment, Electric arc Welding Theory (AC and DC), Safety Precautions while using Electric arc Welding. Practice in Setting Current and Voltage for Striking Proper arc, Common Welding Defects and Inspection, various type of Joints, end Edge Preparation, Explain Soldering, Brazing and Tipping of Tools, Gas Cutting Theory

Exercises:

1. Preparation of a Butt Joint by Gas Welding.
2. Preparation of Lap Joint by Electric arc Welding.
3. Preparation of T-Joint by Electric arc Welding.
4. Demonstration on Brazing by the Instructor.
5. Demonstration on Soldering.
6. Demonstration on Gas Cutting

Unit III

Sheet Metal Shop Theory: Name, Functions and Specification of Common Sheet Metal Tools Like Slakes, Hammers, Hand Snips, Hand Punches, Groovers, Rivet Sets, Chisels Name and Function of Marking and Measuring Tools - Scale, Circumference Rule, Straight Edge, Scriber, Semi Circular Protector, Trammel, Preliminary Idea of Simple Sheet Metal Operations, Different Types of Sheet Metal Edges and Joints, Riveting Methods, Development of Surface in Sheet Metal Work

Exercises: Preparation of following utility Jobs Involving Various Sheet Metal Joints (Single and Double Hem Joints, Wired Edge, Lap Joint,Grooved Seam Joint, Single and Double Seam Joint) and Exercises (Soldering and Riveting Joints) 1. Preparation of a Soap Tray & Mug 2. Preparation of Funnel.

Unit IV

Fitting Shop Theory-Introduction to different materials used in Fitting Shop, Description of Work Bench, Names, Functions and Specification of Holding Devices, Specification of Files, Precautions While Filing, Marking of Jobs, use of Marking and Measuring Tools, What is Chipping, Where Chipping is done, Names Functions and Specifications of Chisels, Hammers etc., Simple Operation of Hacksawing, different types of Blades, and their uses, Fitting of Blade in Hacksaw Frame, Name, Functions and Specifications of Drills, Selection of Drills for Tapping, Types of Tapes, Tapping and Dieing Operations, Precaution While Drilling Soft Metals, Specially Lead.

Exercises:

1. Marking Filing & Hack Sawing Practice.
2. Production of Utility Job involving Marking, Filling and Hack Sawing.
3. Production of Utility Job involving Marking, Filling and Hack Sawing Drilling and Tapping.

Unit V

Plumbing shop Theory-Classification of Pipes According to Materials and use I.S.I. Specification for Pipes, Introductions to Cement and PVC Pipes and their uses.Names Functions and Specifications of Plumbing Tools and Accessories- such as Pipe Dies, Wrenches, and Pipe Vices, Different Pipe Fittings.

Exercises:

1. Cutting and Threading on G.I. Pipe
2. Exercise on PVC Pipe Fitting.
3. Repair of Taps and Cocks.

Reference Books:

1. Workshop Technology	Gupta & Malani
2. Workshop Technology	Kumar & Mittal
3. Workshop Technology	Hajra, Chaudhary
4. Workshop Technology	B.S. Raghhuwanshi
5. Workshop Technology (Hindi)	Tahil Maghnani
6. Workshop Technology (Hindi)	Vinay Kumar
7. Domestic Devices and Appliances	K.B. Bhatia

DE208 CHETNA VIKAS MULYA SHIKSHA

Paper: Basic elements in Consciousness Development, Human Values

Unit I: Holistic Understanding of Harmony on Ethics

1. Natural acceptance of Universal Human Values
2. Definitiveness of Ethical Human Conduct
3. Ability to identify the scope and characteristics of people-friendly and eco-friendly production systems, technologies and models
4. Strategy for transition from the present state to Universal Human Order: Discussion
5. Need for Consciousness Development to ensure Human-Values and living in 'Human-Consciousness', Need for Study/ *adhyayan* to ensure Consciousness Development

Unit II: Need and Understanding the Knowledge

1. learning's harmony at all Levels of Living:
    a In Individual
    b In Family
    c In Society
    d In Nature
    e Existence
2. Establish the need for Right Understanding or Knowledge
    a Resolution, Right Understanding = Happiness = Fundamental need of the Human Being
3. Understanding the meaning of Resolution = Knowledge and its objective
4. Knowledge =
    a Knowledge of holistic-view of Self (jeevan) [*jeevan-gyan*]
    b Knowledge of holistic-view of Existence (Nature) [*astitv-darshan-gyaan*]
    c Knowledge of complete-humane conduct [*manviyata-purna-aacharan gyaan*]
5. Truth : Vastugat satya, Stithi Satya, vastustithi satya

Unit III: Knowledge of holistic-view of Self (jeevan) [jeevan-gyan]

1. Human being as a co-existence of the sentient 'Self'(*'jeevan*') and the material 'Body'
   Exercise on Differences in 'Self'(*'jeevan*') and Body on the basis of
    a. Needs
    b. Fulfilled by
    c. Nature of Activities (Conscious & Material) [*jad aur chaitanya*]
    d. Knowing, Assuming, Recognizing and Fulfilling (*janana, manana, pehchana, nirvah karna*)
2. Discussion of activity of 'Imagination' or *kalpanashilta* in 'Self'(*'jeevan*')
   Discussion of 4.5 activities in 'Self'(*'jeevan*')
    a. Tasting & Selection [aswadan-chayan]
    b. Weighing and Analysis [tulan-vishleshan]
    c. Imaging [chitran]

   Discussion of Expectation, Thoughts and Desires (*asha – vichar- ichha*)
3. Discussion on various Desires and Thoughts and how they are coming from beliefs and pre-conditioning
   Analysis of Desires as coming from beliefs (*manyata*) or sensations (samvedana)

4. Discussion on the reasons for the above
   Introduction of perspectives of likes-health-profit [*priya-hit-labh*]
   Establishing perspectives of likes-health-profit [*priya-hit-labh*] as the reasons for current problems and unhappiness at all levels of living
5. Need to move from 'animal-consciousness' to 'human consciousness'
   Way to move as focusing on the perspectives of justice-religion-truth [*nyaya-dharma-satya*] & discussion on the same
   Discussion on the dormant 5 activities of: contemplation, comprehension, determination, realization and evidencing (*chintan, bodh, sankalp, anubhav, pramaan*)

Unit IV: Knowledge of holistic-view of Existence - I (Nature) [*astitv-darshan-gyaan*]

1. Introduction to Existence as Coexistence (*astitva sah-astitva hai*) as conscious and material (*chaitanya evam jad*) units saturated in void, or space - Each unit of matter is saturated in omnipresent reality.
   Discussion on meaning of soaked, immersed and ecompassed *(bhiga, duba, ghira*)
2. Introduction to Effort, Motion and Result (*shram, gati, parinam*)
3. Fullness in Nature
   Material order: Full of Energy, is active
   Bio order: Full of Energy, is active, has pulse
   Animal order: Full of Energy, is active, has pulse, full of hope to live.
   Knowledge order: Full of energy, is active, has pulse, full of hope to live, full of knowledge
4. The Four Evolution Stages in Existence
   Material order (material nature)
   Bio order (material nature)
   Animal order (conscious nature)
   Knowledge order (conscious nature)
   Material nature is active and can have pulse.
   Conscious nature is full of consciousness – i.e. animal consciousness or human consciousness.
5. Progression in Existence (*vikaskram, vikas, jagritikram, jagriti*)
   In the course of evolution in matter's configuration (atomic configuration) there are many statuses as 'results' – each with its usefulness and complementariness (interdependence), orderly with its essence and participating in universal order (harmony) of existence

   Coexistence is always in effect; this is the cause of matter having innate direction towards perfection, which manifests as evolution – atoms in solid and gaseous states, many kinds of molecules. Upon Earth's becomes enriched thus tendency of uniting to form compounds spontaneously emerges in these atoms, which results in evolution of the world of chemicals (bases, acids, proteins, hormones).

Upon becoming enriched with four fundamental chemical elements (acid, base, protein, hormone), bio order evolves on an Earth. Bio order has cyclicality (tradition) by way of seed heredity. This (cycle of seed-tree-soil-seed) itself is bio order

Upon fulfilment of bio order (as numerous kinds of vegetations) their remains (like rotten leaves, wood etc) give rise to the world of insects.

Unit V: Knowledge of holistic-view of Existence - II (Nature) [*astitv-darshan-gyaan*]

1. Human being is a combined form of jeevan and body. When humans went about recognizing one another assuming themselves to be body, humans became divided based on differences in their skin colour and (assumed) racial origins. While in reality human body is only of one type. Human race is one.
2. Humans became capable of recognizing the fact of their racial oneness only after 20th century. As its evidence, human focussed contemplation came about as Madhyasth Darshan (Sah-astitva-vad) only in 20th century.
3. Human focussed contemplation knowledge based on existence itself is manifestation of coexistence, as: -
    - Holistic view of Existence
    - Knowledge of Jeevan
    - Knowledge of Perfectly Humane Conduct
4. Introduction to 4 dimensions to every unit: Appearance, Qualities, Characteristics and Religion (*rup, gun, swabhav, dharm*)
5. Development in Atom = Configurationally Perfect Atom = Jeevan (conscious status) philosophical interpretation

Course Books:

- Introductory Collection, Adhyayan Bindu & Jeevan Vidya an Introduction: *{ Parichaytmak Sankalan, Jeevan Vidya ek Parichay }* – Madhyasth Darshan, Sah-astitva-vaad (Coexistentialism) by A Nagraj, Jeevan Vidya Prakashan, Amarkantak, India

Reference Books:

- Holistic-view of Human Behavior, Human Work, Human Practice & Human Realization: *{ Vyawhaar Darshan, Abhyas Darshan, Karm Darshan, Anubhav Darshan }* - by A Nagraj, Jeevan Vidya Prakashan, Amarkantak, India