SEMESTER -I

Subject Code	Subject	Hrs. /Week			Exam Hrs.	Maximum Marks				
		L	T	P		MS1	MS2	IA	Th.	Total
Personality Development Program for First 15th Days										
THEORY										
1D01	English &Communication Skills	2	0	0	3	10	10	20	60	100
1D02	Applied Chemistry-I	3	1	0	3	10	10	20	60	100
1D03	Applied Physics-I	3	1	0	3	10	10	20	60	100
1D04	Applied Mathematics-I	4	1	0	3	10	10	20	60	100
1D05	Computer Fundamental & Information Technology	3	1	0	3	10	10	20	60	100
Code	**Subject**	**Hrs. /Week**			**Exam Hrs.**	**IA (60%)**		**EA (40%)**		**Total**
		L	**T**	**P**		**MP1 (30%)**	**MP2 (30%)**			
1D06	Applied Chemistry Lab-I	0	0	2	2	30	30	40		100
1D07	Applied Physics Lab-I	0	0	2	2	30	30	40		100
1D08	Computer Fundamental & IT Lab I	0	0	2	2	30	30	40		100
1D09	**Engineering Drawing**	0	0	3	3	30	30	40		100
1D10	Workshop Practice – I	0	0	3	3	30	30	40		100
	TOTAL	**15**	**04**	**12**						**1000**

SEMESTER – II

Subject Code	Subject	Hrs. /Week			Exam Hrs.	Maximum Marks				
		L	T	P		MS1	MS2	IA	Th.	Total
THEORY										
2D01	Applied Chemistry-II	3	1	0	3	10	10	20	60	100
2D02	Applied Physics-II	3	1	0	3	10	10	20	60	100
2D03	Applied Mathematics-II	4	1	0	3	10	10	20	60	100
2D04	Electrical & Electronics Technology	3	1	0	3	10	10	20	60	100
2D05	Applied Mechanics	3	1	0	3	10	10	20	60	100
Code	**Subject**	**Hrs. /Week**			**Exam Hrs.**	**IA (60%)**		**EA (40%)**		**Total**
		L	**T**	**P**		**MP1 (30%)**	**MP2 (30%)**			
2D06	Applied Chemistry Lab-II	0	0	2	2	30	30	40		100
2D07	Applied Physics Lab-II	0	0	2	2	30	30	40		100
2D08	Electrical & Electronics Workshop	0	0	2	2	30	30	40		100
2D09	Workshop Practices-II	0	0	2	3	30	30	40		100
2D10	Computer Fundamental & IT Lab-II	0	0	2	2	30	30	40		100
	TOTAL	**16**	**05**	**10**						**1000**

SEMESTER – III

Code	Subject	CR.	Hrs. /Week			Exam Hrs.	Maximum Marks				
			L	T	P		MS1	MS2	IA	Th.	Total
Theory											
3DCE01	Strength of Materials- I	3	3	1	0	3	10	10	20	60	100
3DCE02	Construction Materials & Equipment- I	3	3	1	0	3	10	10	20	60	100
3DCE03	Surveying-I	3	3	1	0	3	10	10	20	60	100
3DCE04	Fluid Mechanics	3	3	1	0	3	10	10	20	60	100
3DCE05	Environmental Engg.	3	3	1	0	3	10	10	20	60	100

Practical's & Sectionals

Code	Subject	CR.	Hrs. /Week			Exam Hrs.	IA (60%)		EA (40%)	Total
			L	T	P		MP1*30%	MP2*30%	Pr.W40%	
3DCE06	Strength of Materials Lab- I	2	0	0	2	3	30	30	40	100
3DCE07	Construction Materials & Equipment lab- I	2	0	0	2	3	30	30	40	100
3DCE08	Survey Lab-I	2	0	0	2	3	30	30	40	100
3DCE09	Fluid Mechanics Lab	2	0	0	2	3	30	30	40	100
3DCE10	Building Drawing	2	0	0	2	3	30	30	40	100
	GRAND TOTAL	25	15	5	10					1000

SEMESTER – IV

Code	Subject	CR.	Hrs. /Week			Exam Hrs.	Maximum Marks				
			L	T	P		MS1	MS2	IA	Th.	Total
Theory											
4DCE01	Strength of Materials -II	3	3	1	0	3	10	10	20	60	100
4DCE02	Concrete Technology	3	3	1	0	3	10	10	20	60	100
4DCE03	Soil & Foundation Engineering	3	3	1	0	3	10	10	20	60	100
4DCE04	Building Technology	3	3	1	0	3	10	10	20	60	100
4DCE05	Construction Material & Equipment II	2	2	1	0	3	10	10	20	60	100
Practical's & Sessionals											
Code	**Subject**	**CR.**	**Hrs. /Week**			**Exam Hrs.**	**IA (60%)**		**EA (40%)**	**Total**	
			L	T	P		MP1* 30%	MP2* 30%	Pr. W 40%		
4DCE06	Strength of material Lab II	2	0	0	2	3	30	30	40	100	
4DCE07	Construction Material & Equipment lab-II	2	0	0	2	3	30	30	40	100	
4DCE08	Concrete Lab	2	0	0	2	3	30	30	40	100	
4DCE09	Soil & Foundation Engg. Lab	2	0	0	2	3	30	30	40	100	
4DCE10	Computer aided drawing	2	0	0	2	3	30	30	40	100	
	GRAND TOTAL	24	14	05	10					1000	

Industrial Training - After examination of 4th Semester, the students shall go for training Concrete Technology in a relevant industry/field organization for a minimum period of 6 weeks and shall prepare a diary. It shall be evaluated during 5th semester by his/her teacher for 40 marks. The students shall also prepare a report at the end of training and shall present it in a seminar, which will be evaluated for another 40 marks. This evaluation will be done by HOD and lecturer in charge – training in the presence of one representative from training organizations

SEMESTER – V

Code	Subject	CR.	Hrs. /Week			Exam Hrs.	Maximum Marks				
			L	T	P		MS1	MS2	IA	Th.	Total
Theory											
5DCE01	Construction Management & Accounts	3	3	1	0	3	10	10	20	60	100
5DCE02	Theory of Structures	3	3	1	0	3	10	10	20	60	100
5DCE03	Design of R.C.C. Structures-	3	3	1	0	3	10	10	20	60	100
5DCE04	Water Supply & Sanitary Engineering	3	3	1	0	3	10	10	20	60	100
5DCE05	Civil engineering Estimating & Costing	3	3	1	0	3	10	10	20	60	100

Practical's & Sessionals

Code	Subject	CR.	Hrs. /Week			Exam Hrs.	IA (60%)		EA (40%)	
			L	T	P		MP1*30%	MP2*30%	Pr. W 40%	Total
5DCE06	Water Supply & Sanitary Lab	2	0	0	2	3	30	30	40	100
5DCE07	Civil engineering Estimating & Costing	2	0	0	2	3	30	30	40	100
5DCE08	Design of concrete structure	2	0	0	2	3	30	30	40	100
5DCE09	Advanced Foundation Lab		0	0	2	3	30	30	40	100
5DCE10	Practical Training and industrial visit		0	0	2	3				100
	GRAND TOTAL	20	15	05	10					1000

SEMESTER – VI

Code	Subject	CR.	Hrs. /Week			Exam Hrs.	Maximum Marks				
			L	T	P		MS1	MS2	TA	Th.	Total
Theory											
6DCE01	Design of steel structure	3	3	1	0	3	10	10	20	60	100
6DCE02	Surveying II	3	3	1	0	3	10	10	20	60	100
6DCE03	Earthquake resistant Engineering	3	3	1	0	3	10	10	20	60	100
6DCE04	Transportation Engineering	3	3	1	0	3	10	10	20	60	100
6DCE05	Irrigation engineering	3	1	1	0	3	10	10	20	60	100
Practical's & Sessional											
Code	**Subject**	**CR.**	**Hrs. /Week**			**Exam Hrs.**	**IA (60%)**		**EA (40%)**		**Total**
			L	T	P		MP1*30%	MP2* 30%	Pr. W 40%		
6DCE06	Surveying Lab II	2	0	0	2	3	30	30	40		100
6DCE07	Transportation Engg. Lab	2	0	0	2	3	30	30	40		100
6DCE08	Design of Steel Structures Lab	2	0	0	2	3	30	30	40		100
6DCE09	Final Project Report	4	0	0	0	0					200
	GRAND TOTAL	24	12	04	04						1000

Semester-I

1D01: English Communication & Skills-I		
Objective: English communication encompasses written, oral, visual and digital communication within a workplace context. This discipline blends together pedagogical principles of rhetoric, technology, and software to improve communication in a variety of settings ranging from technical writing to usability and digital media design.		
Unit	**Topic**	**35hrs**
Unit – I	Narration, Voice, Basic Sentence Patterns. (Nine basic sentence patterns)Tenses, Common errors (Noun, Pronoun, Articles, Adverb, Punctuation, Preposition etc.)Transformation of Sentences, Determiners, Preposition	**5**
Unit – II	Modals in Conversational Usage, Prefix, Suffix, Idioms & Phrasal verbs: Modals Can, Could, Should, Will, Would, May, Might, Must, Need not, Dare not, Ought to, Used to. **Phrase** At all; Instead of; In Spite of; As well as; Set up; Upset; Look up; Call off; Call out; Come across; Set right; Look other. **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).	**8**
Unit – III	Composition - . Unseen Passage, Précis Writing Letter Writing: Letter to the editor of a magazine, newspaper, business letters, letters to relatives, friends, government officers. Report Writing Paragraph Writing, Essay Writing - Essays on general and local topics related to environmental problems.	**6**
Unit – IV	**Listening:** For improving listening skills the following steps are recommended, Listen to Prerecorded Tapes, Reproduce Vocally what has been heard, Reproduce in Written form. Summaries the text heard, Suggest Substitution of Words and Sentences, Answer Questions related to the taped text, Summaries in Writing **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. learn at this school I learnt from the morning news **Group Discussion :** Developing skill to initiate a discussion [How to open] Snatching initiative from others [Watch for weak points, etc.]	**8**
Unit – V	**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]**Delivering Short Discourses:** About one self Describing a Place, Person, Object Describing a Picture, Photo. **Expand a topic-sentence into 4-5 sentence narrative. Note :**1. The Medium of teaching and examination will be English.2. The Question on Essay Writing (Unit-7) will be compulsory. The student will have to attempt one essay out of two, touching the given points on general/local topic related to environmental problems.3. At least on question will be set from each unit.4. No theory question will be set from syllabus of practicals.	**8**

	Text Books: Intermediate English Grammar Raymond Murphy, Pub: Foundation Books, New Delhi2. Eng. Grammar, usage & Composition Tickoo & Subramanian Pub: Scand and Co.3. Living Eng. Structure Standard Alien. Pub: Longman4. A Practical Eng. Grammar Thomson and Martinet. (and its Exercise Books) Pub : ELBS5. High School English Grammar Wren & Martin. and Composition **Reference Book :**1. Communicative Skills for Engineers and Scientists by Sangita Sharma and Binod Sharma, New Delhi : Pearson.2. English for Engineers by Abidi & Ritu, New Delhi : Cengage Learning.	

1D02: Applied Chemistry-I

Objective	**Chemistry** is the science of matter, especially its chemical reactions, but also its composition, structure and properties. Chemistry is concerned with atoms and their interactions with other atoms, and particularly with the properties of chemical bonds.	
	Topic	**38 Hours**
Unit – I	**Atomic Structure**: Constituents of the Atom, Bohr's Model of the Atom, Quantum Number and Electronic Energy Levels , Aufbau's Principle, Pauli's Exclusion Principle, Hand's Rule + *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, Ionizations, Potential. Electron Affinity. Electro negativity. Variation of Effective Nuclear Charge in a Period. Metallic Character.	**8**
Unit – II	**Electro Chemistry:** Ionization, Degree of Ionization, Factors which Influence Degree of Ionization .Hydrolysis – Degree of Hydrolysis, Hydrolysis Constant., pH Value, Buffer Solution Electrolysis, Faraday's Laws of Electrolysis	**8**
Unit – III	**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 **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. (up to C5).	**8**
Unit – IV	**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 Steel6.5 Effect of Alloying Elements in Steel **Pollution:** Water Pollution, Causes and Effects, Treatment of Industrial Water Discharges -Screening, Skimming and Sedimentation Tanks, Coagulation, Reductions, Chlorination, Biological Methods. Air Pollution Causes and Effects Control Methods – Electrostatic Precipitator, Scrubbers, Gravitational Setting Methods, by Plants. Awareness on	**8**
Unit – V	**Water:** Sources of Water**,** Hardness of Water.**,** Degree of Hardness, Estimation of Hardness by EDTA method, Problems on Calculation of Hardness**,** Disadvantages of	**6**

	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.	
	Text Books: 1. Engineering Chemistry II (Hindi) Mathur and Agarwal2. Chemistry of Engineering Materials C.V. Agarwal3. Engineering Chemistry P.C. Jain and Monika4. Chemistry M.M. Uppal5.Applied Chemistry (Hndi) V.P.Mehta Jain Bros. Jodhpur **Reference Books:** Instrumental methods of Chemical analysis, MERITT & WILLARD (EAST – WEST press) Physical Chemistry , P.W Atkin (ELBS, OXFORD Press) 3 Physical Chemistry W.J.Moore (Orient Longman)	

1D03: Applied Physics-I		
Objective: physics employs mathematical models and abstractions of physics to rationalize, explain and predict natural phenomena. This is in contrast to experimental physics, which uses experimental tools to probe these phenomena.		
Unit	**Topic**	**36 Hours**
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 Dimensions**,** Dimensional Analysis**,** Applications and Limitations **Elasticity :** Elasticity**,** Stress and Strain**,** Elastic Limit & Hooke's law**,** Young's Modulus, Bulk Modules & Modulus of Rigidity, Poisson's Ratio	**8**
Unit – II	**Properties of Liquids:** Surface Tension & Surface Energy**,** Cohesive & Adhesive Force, Angle of Contact**,** Capillarity & Expression for Surface Tension **,** Streamline & Turbulent Flow**,** Reynolds Number, Viscosity & Coefficient of Viscosity. Stokes's law & Terminal Velocity	**8**
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	**8**
Unit – IV	**Gravitation & Satellites:** 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. **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	**6**
Unit – V	**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 **D.C. Circuits :** Resistivity, Effect of Temperature on Resistance , Ohm's Law, Resistance in Series and Parallel and their Combination Kirchoff's Law Wheatstone Bridge Meter Bridge Principle of Potentiometer	**6**
	Suggested Text Books: 1.Engineering Physics Gaur & Gupta (hindi)2. Applied Physics Vol.-I Hari Harlal, NITTTR3. Applied Physics Vol.-II Hari Harlal, NITTTR4,Modern Engineering Physics – A.S. Vasudeva (S. Chand)5,Solid State Physics : Kittel**Suggested Reference Book:**Solid State Physics: S. O. Pillai, Wiley Eastern Ltd. **2.**Physics Vol-I & II – Resnick & Halliday (Wiley Eastern) 3.A Text Book of Optics – Brij Lal & Subramanyam	
1D04: Applied Mathematics-I		
Objective: We can use of abstraction and logical reasoning, mathematics developed from counting, calculation, measurement, and the systematic study of the shapes and motions of physical objects. Practical mathematics has been a human activity for as far back as written records exist.		
Unit	**Topic**	**35 Hours**
Unit – I	**Matrices and Determinants:** Definition and Properties of Determinants**,** Definition and Types of Matrix**,** Transpose of a Matrix, Symmetric, Skew Symmetric Matrices,	6

	Orthogonal matrices, Hermitian and Skew Hermitian, Minors and Cofactors, Adjoint and Inverse of a Matrix, Cramer's Rule,Solution of Simultaneous Linear Equations by Inverse Matrix Method., Characteristic Matrix, Characteristic Equation, Eigen Values & Vectors, Cayley Hamilton Theorem (verification only)	
Unit – II	**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	6
Unit – III	**Introduction to Different Types of Expansion:** Factorial Notation, Meaning of C(n, r), P(n, r), Binomial Theorem for Positive Index, any Index, Exponential Theorem, Logarithm Theorem **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	8
Unit – IV	**Two Dimensional Coordinate Geometry:** General Introduction**,** Distance Formula and Ratio Formula ,Co-ordinate of Centroid, In-Centre, Ortho-Centre and Ex-Centreof 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 LinesPerpendicular Distance of a Line from a Point	7
Unit-V	**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 Equations**,** Equations of Tangent and Normal at a Point(simple problems)	8
	Text Books:1. Mathematics XI & XII NCERT, New Delhi2. Mathematics XI & XII Rajasthan Board, Ajmer(Hindi)3. Polytechnic Mathematics H. K. Dass4. Text Book on Differential Calculus Chandrika Prasad **Reference Books:**1:Advanced Engineering Mathematics, Erwin Kreyszig, Wiley 9th Edition.2:Higher Engineering Mathematics, B.V.Ramana, Tata McGraw Hill.3: Thomas Calculus, Maurice D. Weir, Joel Hass and others, Pearson, 11th Edition.	
1D05: Computer Fundamental & Information Technology		
Objective: Computer programming (often shortened to programming or coding) is the process of designing, writing, testing, debugging, and maintaining the source code of computer programs. This source code is written in one or more programming languages.		
Unit	**Topic**	**40 Hours**
Unit – I	**Introduction:** Computer: An Introduction**,** Generation of Computers & Types : PC, PC/XT, PC/AT, Main Frame, Super, Lap Top, Pam Top**,** Central Processing Unit (CPU) Memory Unit, Input/ Out Devices : Keyboard, Mouse (Optical), Digitizer, Scanner,Web Camera, Monitor (CRT, TFT) , Printers, Plotters, Bar Code Reader, Secondary Storage Devices : Floppy, Hard Disk, CD, DVD, Flash, Drive, Block Diagram Showing	**8**

	Interconnection of Computer Parts, **Data Representation:** Bit, Nibble, Byte, Word**,** **Number System** : Decimal, Binary, Hexadecimal & their Conversions, Arithmetic Operations (Addition, Subtraction using Binary Number System) 1s , 2s Compliment, Coding Technique : BCD, EBCDIC, ASCII ,Idea of: Hardware ,Software, Firmware, Free ware, Human ware, Computer Languages and Translators Machine, Assembly, High Level Language, Scripting Language, Object Oriented Language, Platform Independent Language, Translators: Assembler, Interpreter, Compiler	
Unit – II	**Operating System :** Definition of Operating System (OS)**,** Types of OS**,** Single user, Multi user**,** Multi Programming**,** Time Sharing**,** Multi Processing ,**Introduction to Windows XP:** Introduction to Windows Environment**,** Parts of Windows Screen**,** Icon, Menu, Start Menu**,** Minimizing , Maximizing , 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.	**8**
Unit – III	**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 **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 : LAN, WAN, MAN, Blue tooth 6.6 LAN Topologies: Bus, Star, Ring, Hybrid Introduction to Ports : RS232, IEEE 488, PS2, USB, UTP	**8**
Unit – IV	**Information Processing:** Word processor**,** Introduction to MS-Word**,** Starting MS-Word Special Features of MS-Word**,** Using Help**,** Opening Document, Typing and Editing**,** Copying, Inserting, Moving, Deleting**,** Copying from One Document to Others , Undo, Redo, Spell Check, Find and Replace**,** Formatting**,** Characters and Fonts **,**Spacing Removing Characters Formatting**,** Inserting Symbols**,** Paragraphs, Page Setting**,** Header and Footer**,** Page Breaks**,** Borders and Shading**,** Print Preview and Printing**,** Tables and Columns**,** Mail Merge**.** Auto Text and Auto correct**,** Introduction to Macro**,** Electronic Spread Sheet**,** Introduction to MS-Excel**,** Working with Spread Sheet**,** Editing the Worksheet**,** Worksheet Formatting**,** Formula Entering**,** Function Wizard**,** Saving and Printing Work Book**,** Analysis Tools **Data Tools** Charts Linking Work Sheets**,** Report Wizard**,** Data Base Application**,** Data Base Components**,** Working with Database**,** Creating Excel Database**,** Adding Records using Data Form**,** Deleting Records using Menu Command**,** Deleting Records using Data Form**,** Editing Records**,** Finding Records based on Criteria	**8**
Unit – V	**Internet:** 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. **Power Point:** Introduction to Power Point**,** Creating a Presentation/Slide**,** Adding Animation in Slide**,** Running a Slide Show	**8**
	Suggested Text Books: 1. Computer Fundamental V.K. Jain, Standard Pub.& Distributors2. PC Software for Windows made simple R.K. Taxali, TMH3. Mastering Windows XP TMH4. BPB Computer Course BPB Editorial Board,5.**1.** Computer Fundamental V.K. Jain, (Hindi Edition) **Suggested Reference Books:**1. Introduction to	

	Networking NANCE, PHI2. First Course in Computer Science Sanjeev Saxena, Vikas Publishing House First Look Microsoft Office 2003 Murray, Phi3.Web Based Application Development Ivan Beyross, TMHusing HTML, DHTML, Java script Pearl/ CGI	

1D06: Applied Chemistry Lab-I		
Objective: Develop the ability of students to carry out experiments, collect and interpret data, and critically report results through "hands-on" laboratory experiences.		
	List of Experiments	
	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 Solution6. Determination of the Strength of Farrous Sulfate Solution using Standard7.Solution of Thiosulphate.To determine the strength of NaOH and Na_2CO_3 in a given alkali mixture8.Estimation of percentage of iron in plain carbon steel.9.To find the eutectic point for a two component system by using method of cooling curve.10.Determine the reaction rate constant for the Ist order reaction	
Text Books: 1.Engineering Chemistry , Mathur and Aggarwal2. A text Book of Engineering Chemistry , S.K. Jain & K.D. Gupta**Reference Books**:1.Practical Chemistry For Engineers , Dr. Renu Gupta & Dr. Sapna Dubey		
1D07: Applied Physics Lab-I		
Objective: : An experiment or test can be carried out using the scientific method to answer a question or investigate a problem. he results are analyzed, a conclusion is drawn, sometimes a theory is formed, and results are communicated through research papers.		
	List of Experiments	
	1. To Measure Internal Dia, External Dia and Depth of a Calorimeter usingVernier Callipers.2. To Measure Density of a Wire using Screwgauge3. 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 Microscope6. To Determine Focal Length of a Convex Lens by Displacement Method.7. To Determine the Velocity of Sound at O0c using Resonance Tube.8. To Determine Young's Modulus of Elasticity using Searle's Apparatus.9. To Determine Acceleration due to Gravity using simple pendulum.10. To verify Newton's law of cooling.	
	Text Book: 1. Advanced Practical Physics – B.L. Workshop and H.T. Flint (KPH) 2. Practical Physics – S.L.Gupta&V.Kumar (PragatiPrakashan). **Reference Books:**1.. Advanced Practical Physics Vol.I& II – Chauhan& Singh (PragatiPrakashan)	
1D08: Computer Fundamental & IT Lab- I		
Objective: The choice of language used is subject to many considerations, such as company policy, suitability to task, availability of third-party packages, or individual preference. Ideally, the programming language best suited for the task at hand will be selected.		
	List of Experiments	
	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	
	Suggested Text Books: Yadav DS, Foundations of IT, New Age, Delhi. Curtin, Information Technology: Breaking News, Tata Mo Grew Hill. **Suggested Reference Books:**Nelson, Data Compression, BPB.	

1D09: Engineering Drawing		
Objective: In order to produce a good product, a neat drawing is a must. Therefore students must be well acquainted with the knowledge of Engineering drawing. Engineering drawing is the universal language of engineers and student must be made familiar with all the relevant aspect topics of machine drawing.		
	List of Experiments	
	1. Preparation of following on Imperial Size Drawing Sheet :-1.1 Lines, Letters and Scales 1.2 Geometrical Constructions and Engineering Curves. 1.3 Projection of Lines 1.4 Projection of Planes 1.5 Projection of Solids 1.6 Orthographic Projections of Simple objects 1.7 Section and Development of Surfaces of Solids i.e. Cone, Cylinder, Sphere etc.1.8 Section and Development of Surfaces of Prism and Pyramids1.9 Isometric Projections 1.10 Riveted Joints. 1.11 Screw Threads and Fasteners 1.12 Pulleys 1.13 Couplings 1.14 Bearing 1.15 Building Drawing**2. Preparation of following Drawings in Sketch Book (Home Assignment)**2.1 Lettering (On Graph Sheet)2.2 Projection of Points In Different Quadrants2.3 Isometric Projection of Various Planes2.4 Various Types of Rivet Heads2.5 Section and Conventions2.6 Set Screws2.7 Machine Screws2.8 Foundation Bolts, Keys	
	Text Books: 1. Engineering Drawing N D Bhatt2. Machine Drawing N D Bhatt3. Engineering Graphics V. Laxmi Narayan4. Machine Drawing V. Laxmi Narayan5. Engineering Drawing P S Gill6. Machine Drawing M L Mathur **Reference Books:** 1. A Text Book of Machine Drawing Laxmi Narayana and Mathur, M/s. Jain Brothers, New Delhi.	

2D10: Workshop Practice – I		
Objective: This subject is designed to give basic knowledge of carpentry shop , fitting shop , welding shop & sheet metal shop with practical expose		
	List of Experiments	
	Carpentry Shop1. Preparation of Cross-Half Lap Joint.2. Preparation of Dovetail Joint3. Preparation of Bridle Joint4. Preparation of Mortise and Tenon Joint5. Preparation of Mitre Joint6. Demonstration of Job on Wooden Polishing Work**Welding**7. Preparation of a Butt Joint by Gas Welding.8. Preparation of Lap Joint by Electric arc Welding.9. Preparation of T-Joint by Electric arc Welding.10. Demonstration on Brazing by the Instructor.11. Demonstration on Soldering.12. Demonstration on Gas Cutting.	
1	**Suggested Text Books :**1. Workshop Technology Gupta & Malani2. Workshop Technology Kumar & Mittal3. Workshop Technology Hajra, Chaudhary **Suggested Reference Books:** Work shop Manual - P.Kannaiah/ K.L.Narayana/ Scitech Publishers.	

Semester-II

2D01: Applied Chemistry-II **(Cr, L:T:P:-3,3:1:0)**		
Objective: The reactions & synthesis procedures of materials like water analysis, chemical kinetics, corrosion and basic chemistry (IUPAC) behind them will makes interesting the topic & improve the research ability with their wide ideas.		
Unit	**Topic**	**40Hours**
Unit – I	**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 AlcoholBio-Gas, Nuclear Fuels – Introduction to Fission and Fusion Reactions.	**8**
Unit – II	**Corrosion:** Definition **Theories ff 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	**8**
Unit – III	**Polymers:** Definition **Plastics:** Classification, Constituents**,** Preparation, Properties and Uses of Polythene, Bakelite Terylene and Nylon. **Rubber:** Natural Rubber, Vulcanization **,**Synthetic Rubbers - Buna - N, Buna-S, Butyland Neoprene	**8**
Unit – IV	**Cement and Glass:** Manufacturing of Portland Cement**,** Chemistry of Setting and Hardening of Cement**,** Glass : Preparation, Varieties and Uses. **Lubricants:** Definition, Classification Properties of Lubricants : Viscosity, Oiliness, Flash Point, Fire Point, Acid Value, Saponificatin, Emulsification, Cloud and PourPoint., Artificial Lubricants	**8**
Unit-V	**Miscellaneous Materials:** Refractory's: Definition, Classification and Properties Abrasives : Natural and Synthetic Abrasives**,** Paint and Varnish : Definition and Function of Constituents**,** Soap and Detergents : Definition, Properties and Uses**15. _ew Engineering Materials: (Brief Idea of Following)** Superconductors, Organic Electronic Materials Fullerences Optical Fibres	**8**
1 **Text Books**1. Practical Chemistry for Engineers Virendra Singh (Hindi)2. Hand book of Technical Analysis Bannerji Jain Bros.Jodhpur3. Engineering Chemistry-I(Hindi) Mathur & Agrawal.4.. Inorganic Chemistry Shivhare & Lavania**Suggested Reference Books:** Engineering Chemistry, Jain & Jain, Dhanpat RaiEngineering Chemistry, M.M. Uppal		

2D02:	Applied Physics-II	
Objective: physics is combined with problem solving and engineering skills, which then has broad applications. Career paths for Engineering physics is usually (broadly) "engineering, applied science or applied physics through research, teaching or entrepreneurial engineering".		
Unit	**Topics**	**38 Hours**
Unit – I	**A.C. Circuits:** 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 anAC Circuit, AC Circuits Containing, R-L, R-C and LCR in Series ,Power in AC Circuit and Power Factor,Choke Coil	**8**
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),Junction Transistors, Working, Biasing and Characteristic Curves, Brief Idea of Using Transistors as an Amplifier (without mathematical analysis)	**10**
Unit – III	**Modern Physics:** Photo Electric Effect**,** Einstein's Equation**,** Photo Cells**, Lasers:** Stimulated Emission and Population Inversion, Types of Laser - Helium Neon and Ruby Laser, Application of Lasers (brief idea only),Material Processing, Lasers in Communication Medical Applications	**8**
Unit – IV	**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, Idea of Nuclear Fission and Fusion. Chain Reaction, Nuclear Reactor	**8**
Unit –V	**Pollution and its control:** Introduction to Pollution – Water, Air, Soil , Noise, Nuclear andmental pollution, Types of Pollution , Brief idea about Noise Pollution and its Control, Nuclear Hazards, Nuclear Waste Management	**4**
1 **Suggested Text :1.**A Text Book of Applied Physics N.S. Kumar (Hindi)**2.**Principles of Physics Brijlal, Subhramanyam 3.Applied Physics Vol.-II Hari Harlal, NITTTR **Reference Books:**A Text Book of Applied Physics N.S. KumarPrinciples of Physics Brijlal, Subhramanyam		

2D03: Applied Mathematics-II		
Objective: Engineering mathematics is a branch of mathematics that concerns itself with mathematical methods that are typically used in science, engineering, business, and industry. Thus, "applied mathematics" is a mathematical science with specialized knowledge.		
Unit	**Topics**	**40 Hours**
Unit – I	**Limits:** Concept of Limit**,** L.H.L., R.H.L., Limit of Standard Functions , Concept of Continuity and Differentiability at a Point (simple Problems)**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	**8**
Unit – II	**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**Applications of Differential Calculus:** Geometrical meaning of dy / dx . Tangents and Normals **,** Angle of Intersection between two Curves**,** Derivative as a Rate Measurer**,** Errors and Approximations**,** Maxima and Minima of Function with one Variable	**10**
Unit – III	**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, Additional standard **F**ormulae, Integration of Trigonometric Functions, Definite Integral and its Properties.	**10**
Unit – IV	C**OORDINATE GEOMETRY Straight Lines: 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**,** Linear differential Equation Bernoulli's Equation**,** Exact differential Equation**,** Substitution Method**,** Solution of Linear Differential Equation of Higher order with Constant Coefficients Applications of Differential Equations to L-R, L-C, L-C-R ,Circuits of Standard Forms	**8**
Unit-V	**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 **Numerical Integration :** Trapezoidal Rule, Simpson's 1/3 Rule, Simpson's 3/8 Rule, Newton - Raphson Rule	**4**
Suggested Text1. Text Book on Differential Calculus Chandrika Prasad (Hindi)2. Text Book on Integral Calculus Chandrika Prasad3. Differential Calculus M. Ray, S. S. Seth, & G. C. Sharma4. Integral Calculus M. Ray, S. S. Seth, & G. C. Sharma **Reference Books:** 1.Integral Calculus, M.Ray, S.S.Seth&G.C.sharma. 2.Vector Calculus, R.Kumar.		
2D04:	**Electrical & Electronics Technology**	
Objective: At the end of the course the student will be able to gauge various fundamentals aspects of Basic Electrical and Electronics engineering covering networks theory, single and three phase circuits, transformers and dc machines. Also it will impart knowledge about transistors and thyristor.		
Unit	**Topic**	**36 Hours**

Unit – I	**DC Networks :** Resistance, inductance, capacitance, current, voltage, power, Ohms law**,** Kirchhoff's Laws, Node Voltage and Mesh Current Analysis; Delta-Star and Star-Delta Transformation, Source Conversion. Classification of Network Elements, Superposition Theorem, Thevenin's Theorem.	**10**
Unit – II	**Single Phase AC Circuits :** Generation of Single Phase AC Voltage, EMF Equation, Average, RMS and Effective Values. RLC Series, Parallel and Series- Parallel Circuits, Complex Representation of Impedances. Phasor Diagram,Power and Power Factor.**Three Phase A.C. Circuits :** Generation of Three-Phase AC Voltage, Delta and Star-Connection, Line & Phase Quantities, 3-Phase Balanced Circuits, Measurement of Power in Three Phase Balanced Circuits.	**10**
Unit – III	**Transformer :** Faraday's Law of Electromagnetic Induction, Construction and Operation of Single Phase Transformer, EMF Equation, Voltage & Current Relationship and Phasor Diagram of Ideal Transformer.	**8**
Unit – IV	**Transistor:** Bipolar Junction Transistor, Transistor Current Components, Characteristics of CE, CB and CC Transistor Amplifiers.**Thyristors:** Diode and VI characteristic, four layer diode, Bi-directional thyristors.	**8**
Suggested Text /: Sahdev – Basic Electrical and Electonics Engg.J.B.Gupta – Basic Electrical and Electronics Engg.(Hindi)B.L. Thareja- Electrical Technology-Vol I**Reference Readings** 1.H.P. Tiwari – Electrical and Electronics Engg. 2. Basic Electrical and Electonics Engg, Tata Mcgraw Hill		

2D05:	Applied Mechanics	
Objective: This subject is design to give the basic knowledge of equilibrium of forces, center of gravity, centroid, moment of inertia and concept and application of work power energy**.**		
Unit	**Topics**	**40 Hours**
Unit – I	**Force:** Definition**,** Units**,** Different Types of Forces. **Coplanar 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 for non-concurrent Forces	**8**
Unit – II	**Application of Principles of Forces & Moments:** Levers & their Types.**,** Reactions of Simply Supported Beams (Graphical & Analytical Method)**,** Steel Yard .**,**Lever Safety ValveFoundry Crane**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.	**10**
Unit – III	**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 **Rectilinear Motion:** Concept**,** Motion under Constant Velocity**,** Motion under Constant Acceleration**,** Velocity-time graph and its uses **Motion under Gravity:** Concept**,** Vertical Motion**,** Smooth Inclined Plane **Projectiles:** Concept	**10**
Unit – IV	**Simple Machines:** Basic Concepts**,** Loss in Friction**,** Inclined Plane**,** Simple & Differential Wheel and Axle (Neglecting Rope thickness)**,** Screw Jack**,** Lifting CrabsSystems of Pulleys, Worm and Worm Wheel **Rectilinear Motion:** Concept**,** Motion under Constant Velocity**,** Motion under Constant Acceleration**,** Velocity-time graph and its uses	**8**
Unit-V	**Motion under Gravity:** Concept**,** Vertical Motion**,** Smooth Inclined Plane **Projectiles:** Concept, Range, Maximum Height and Time of Flight, Equation of Trajectory Calculation of Velocity of Projectile at Certain Height, And at Certain instant **Newton's Laws of Motion:** Definitions**,** Momentum and it's Unit**,** Application of Second Law of Motion	**4**

1. **Suggested Text Books**Engineering Mechanics by, RK Rajpoot (Hindi)Engineering Mechanics by, RS Khurmi Engineering Mechanics By Chitranjan Aggarwal**Suggested Reference BooksEngineering Mechanics by Nelson , Tata Mcgraw HillEngineering Mechanics by Shailesh Kumar**

2D06:Applied Chemistry Lab-II		
Objective: Develop the ability of students to carry out experiments, collect and interpret data, and critically report results through "hands-on" laboratory experiences.		
	List of Experiments	
	1. Determination of the Strength of Copper Sulphate Solution using a Standard Solution of thio Sulphate.2. Determination of pH Values of Given Samples. 3.Determination of Hardness of Water by EDTA Method.4. Estimation of Free Chlorine in Water.5.Determination of Acid Value of an Oil.6. Preparation of Soap.7.To determine the Viscosity & Viscosity Index of a given lubricating oil by Redwood Viscometer No. 1	
Text Books: 1.Engineering Chemistry , Mathur and Aggarwal2. A text Book of Engineering Chemistry , S.K. Jain & K.D. Gupta**Reference Books**:1.Practical Chemistry For Engineers , Dr. Renu Gupta & Dr. Sapna Dubey		
2D07: Applied Physics Lab-II		
Objective: This lab is to help the student to understand the concept of Diode, PN junctions, Half deflection method and the concept of cells**.**		
	List of Experiments	
	1. To Determine Acceleration due to Gravity using Simple Pendulum.2. To Verify Newton's Law of Cooling.3.. To Verify Law of Resistances.4. To Determine Specific Resistance of Material using Meter Bridge.5. To Determine Internal Resistance of a Primary Cell using Potentiometer.6. To Compare emf of two Primary Cells using a Potentiometer.7. To Draw Characteristic Curves of PN Diode and Determine its Static andDynamic Resistance.8. To Draw Characteristic Curves of a PNP/NPN Transistor in CB/CEConfiguration.9.. To Measure Resistance of a Galvanometer by Half-Deflection Metho	
Text Book: 1. Advanced Practical Physics – B.L. Worshnop and H.T. Flint (KPH) 2. Practical Physics – S.L.Gupta&V.Kumar (PragatiPrakashan). **Reference Books:**1.. Advanced Practical Physics Vol.I& II – Chauhan& Singh (PragatiPrakashan)		

2D08: **Electrical & Electronics Workshop**		
Objective: this lab will help the students learn about key and basic electrical devices and apparatus used in day-to-day life. Also this will be useful in gaining knowledge about house hold electrical circuits.		
	List of Experiments	
	1. Study of Symbol, Specification and Approximate Cost of Common Electrical Accessories, Tools and Wires & Cables Required for Domestic Installation. Study of : 2.1 Basic Electricity Rules for a Domestic Consumer2.2 Safety Precautions & use of Fire Fighting Equipments3. Use of series of Phase Tester, Series Test Lamp, Tong Tester and Megger in Testing of Electrical Installation.4. 4.1 Prepare a Potential Divider and Measure Resistance of a Filament Lamp Using Voltmeter and Ammeter.4.2 Measurement of Power and Energy Consumption by an Electric Heater using Watt Meter and Energy Meter.5. Preparation of Wiring Diagram, Wiring, Testing, Fault Finding & Costing for :5.1 Control of one Lamp by one Switch (using Batten and Tumbler Switch)5.2 Control of Stair Case Wiring (using Casing Capping, CFL and Flush Type Switches)5.3 Control of one Bell Buzzer and Indicator by one Switch(using Conduit and Flush type Switch)6. Prepare one Switch Board as per Institutional Requirement (using Flush type Switches, Sockets, MCB, ELCB, Etc.)7. Study, Connecting, Testing and Fault Finding of 7.1 Fluorescent Tube and its Accessories7.2 Ceiling Fan with resistance type and Electronic Regulator8. Study, Functioning, Fault Finding & Repairing of following Domestic Appliances -8.1 Automatic Electric Iron8.2 Air Cooler8.3 Electric Water Pump9. Design, Draw and Estimate the Material required for Installation For a small Residential Building/ Office/ Hall. **Identification of following Resistors and finding their Values:** 1.1 Carbon and Metal Film1.2 Variable Resistance Log and Linear1.3 Semi Variable Preset of One Turn & Multiturn**2. Identification of following Capacitor and finding their Values:** 2.1 Mica2.2 Ceramic2.3 Polysterene2.4 Electrolytic2.5 Tantalum**3. Identification of following Switches and Study of their Working Mechanism:** 3.1 Toggel3.2 Bandswiteh3.3 Rotary3.4 Push to on and off3.5 Press to on and off**4. Identification and Testing of following type of Connectors:** 4.1 Rack and Panel4.2 Printed Circuit Edge4.3 Coaxial4.4 Tape & Ribbon4.5 Plate**5. Study of Different Relays and their Contacts.6. Study of following Tools used in Electronic Workshop:** 6.1 Component Lead Cutter6.2 Wire Strippers6.3 Soldering Iron & Soldering Station6.4 De-Solder Pump**7. Measurement of Voltage, Current and Resistance using Analog &Digital Millimeter. 8. Testing of Electronic, Component such as Capacitor, Inductor, Diode and Transistor. 9. Measurement of Amplitude & Frequency of a Signal using CRO. 10. Verification of Ohm's law using Resistive Circuit and Analog Meters.11. Soldering of different passive component combination on general purpose PCB.12. Sketching of different Electronic Components Symbol on Drawing**	
Text Books : Electrical Workshop M.L. Gupta2. Domestic Devices & Appliances K.B. Bhatia3. Electrical Workshop S.L. Uppal4. Electrical Component & Shop Practice K.R. Nahar5. Maintenance of Electrical Equipments K. S. Janwal6. Hand Book of Philips Component **Reference Books:** 1.Electrical Components and Shop Practice ,K.R. Nahar		
2D09: Workshop Practice -II		

Objective: This Lab is design to give practical exposure of engineering workshop in different shop like smithy shop, machine shop, foundry shop, and student should be able to understand different types of tool, material and measuring instrument and their application.

	List of Experiments	
	Sheet Metal Shop: 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 &Mug2. Preparation of Funnel **Fitting and Plumbing Shop**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.4. Cutting and Threading on G.I. Pipe5. Exercise on PVC Pipe Fitting.6. Repair of Taps and Cocks.	

1. **Suggested Text Books :** 1 Workshop Technology B.S. Raghhuwanshi2. Workshop Technology (Hindi) Tahil Maghnani3. Workshop Technology (Hindi) Vinay Kumar4. Domestic Devices and Appliances K.B. Bhatia**Suggested Reference Books:** Work shop Manual - P.Kannaiah/ K.L.Narayana/ Scitech Publishers

2D10 : Computer Fundamental & IT Lab-II		
Objective: This lab is designed so that the better presentations and documents could be made by the students. It comprises the M.S. Excel, M.S. and PowerPoint presentations.		
	List of Experiments	
	1. Visit to Internet Site 2. Creating e-mail Account, Sending and Receiving e-mails. 3. Sending e-mail with Attachment & Signature 4. Searching Web Page/ Site using Search Engine (eg. google.com, yahoo.com, altavista.com etc.) 5. Exercise Based on MS-Word: 5.1 Document Preparation 5.2 Printing Document 5.3 Mail Merge usage5.4 Draw Table 6. Exercise Based on Ms-Excel: 6.1 Work Book Preparation 6.2 Printing Workbook6.3 Data-base usage6.4 Draw Charts7. Exercise Based on Power Point : 7.1 Creating Slide7.2 Adding, Animations in Slide7.3 Running Slide8. Creating Simple Web Page using HTML.	
Suggested Text Books: 1. Yadav DS, Foundations of IT, New Age, Delhi. 2.Curtin, Information Technology: Breaking News, Tata Mo Grew Hill. **Suggested Reference Books:1.**Nelson, Data Compression, BPB.		

SEMESTER- III		
3DCE01: Strength of Materials-I (Cr, L:T:P:-3,3:1:0)		38hr
	Objective:- In Engineering every structure or machine element is designed for a particular application. Then it is tested. A Degree holder should be capable of designing the various elements for particular requirements. For this he must be able to calculate the stresses in an elements and their nature	
UNIT- I	Simple Stress and Strain: Various mechanical properties, Elasticity, Plasticity, Ductility, Brittleness Toughness ,Hardness ,Concept of stress and strain Type of force - Direct, shear Stress - Tensile, compressive, shear, Hook's law, Statement of Hook's law, Young's modulus of elasticity, Tensile test diagram, Gauge length, Limit of proportionality, Elastic limit, Yield point, Yield strength, Ultimate stress, Rupture strength, Nominal stress, Proof stress, Working stress and factor of safety, Stress and strain calculations, Principle of superposition, Bar of homogeneous section, Bar of uniform cross-section, Bar of steeped cross-section, Bar of composite section	8hr
UNIT-II	Temperature stresses, Homogeneous section, Composite section, Shear stresses, Modulus of rigidity Complementary shear stress, Concept of single shear and double shear, Shear strain, Poisson's ratio and volumetric strain, Lateral strain, Longitudinal strain, Volumetric strain, Bulk modulus, Relationship between elastic constants (Derivation)E=3K(1-2/m), E=2N(1+1/m), E=9KN/(3K+N), Compound Stress:, Introduction, Stress components on an inclined plane, Induced by direct stresses, Induced by simple shear, Induced by direct and simple shear stresses, Mohr's circle:, For like direct stresses. For unlike direct stresses, For two perpendiculars direct stresses with state of simple shear, Principal stresses and planes, Major principal stress, Minor principal stress, Mohr's circle method for principal stresses	8hr
UNIT-III	Strain Energy:, Introduction, Strain energy from stress - strain diagram, Proof resilience, Types of loading - gradual, sudden, impact Stress in gradual loading, Stress in sudden loading, Stress in impact loading, Bending Moments and Shear Force:, Basic concept, Types of support, Movable hinge support (roller), Immovable hinge support, Fixed support, Types of beam, Cantilever beam, Simply supported beam, Fixed beam, Continuous beam, Overhanging beam, Types of load, Point load Distributed load - uniformly and non uniformly, Shear force and bending moment, Concept and calculation of shear force and bending moment, Sign convention for shear force and bending moment Bending moment and shear force diagrams (for point loads, U.D.L. and their combinations),Cantilever beam, Simply supported beam, Simply supported beam with over hang	8hr
UNIT-IV	Moment of Inertia: Concept of moment of Inertia, Radius of gyration, Parallel axis theorem, Perpendicular axis theorem, Moment of Inertia of various section, Rectangle, Triangle, Circle Moment of inertia of unsymmetrical section like: T-section, channel section, L-section etc.	8hr
UNIT-V	Bending Stresses in Beams: Concept of bending stress, Theory of simple bending, Assumptions in theory of simple bending, Use of equation M/I=f/y=E/R(With proof),	

	Design criterion and section modulus, Section modulus, Calculation of max bending stress in beams of rectangular, circular, I and T section	
	Text Books:1. Strength of materials by Ramamurtham2. Strength of Materials, Vol. I by B.C. Punmia.3. Elementary Structural Analysis by Norris & Wilbur Reference books: 1.Strength of Materials by Ryder 2. Strength of Materials by Timoshenko and & Young's 3. Mechanics of Materials by Bear Jhonson	

3DCE02: Constructions Materials & Equipment-I(Cr, L:T:P:-3,3:1:0)		36hr
	Objective: Construction materials are an important part of Civil Engineering. A Civil Engineer should have the thorough knowledge about different materials, useful for constructions. Diploma holder should know the properties of different materials used in Civil Engineering works	
UNIT-I	Stones : Classification of rocks, Geological classification - igneous rocks, sedimentary rocks and metamorphic rocks, Chemical classification - argillaceous, siliceous and calcareous rocks, Physical classification - unstratified, stratified, foliated rocks., Common rock forming minerals and their properties - silica, felspar, mica, hornblende and dolomite., Qualities of good building stone General characteristics, identification and uses of common building stones - granite, basalt, trap, sandstone, lime stone, dolomite, marble, slate, quartzite., Natural bed of stones, Seasoning of stones	8hr
UNIT-II	Bricks: Meaning and composition of brick, Preparation of brick clay - weathering, kneading and tempering of clay, Brief description and use of pug mill, Standard size and shape of wooden and steel moulds, Moulding - ground moulding, table moulding, sand moulding and slop moulding, machine moulding, utility of frog., Brief description and working of different types of kilns, Classification and testing of bricks as per B.I.S.	8hr
UNIT-III	Tiles: Use of tiles, Classification of tiles, According to use, According to shape, Special tiles - Allahabad tiles, Mangalore tiles. Preparation of clay, Moulding, shaping, drying and burning Properties and uses of fire clay tiles Lime: Introduction - lime, calcinations, quick lime, slaking, setting, hardening, hydraulicity, Classification of lime as per B.I.S., Manufacture of lime - process of charging, burning, collection and slaking., Properties and uses of lime, Storage of lime, Testing of lime as per B.I.S., Field test of lime as per B.I.S., Pozzolanic materials as surkhi, cinder and fly ash.	8hr
UNIT-IV	Lime Mortar: Constituents of lime mortar, Functions of sand and surkhi in lime mortar., Preparation of lime mortar - mixing and grinding, Properties and common uses of lime mortar., Constituents, function and properties of lime concrete, Cement and Cement Mortar :, Introduction, Raw material Manufacturing process of ordinary Portland cement, Flow diagram for wet and dry process, Properties and use of ordinary Portland cement, Constituents, function and use of cement mortar	6hr
UNIT-V	Timber: Standing timber, rough timber, converted timber, exogenous trees, endogenous trees, softwood and hard, wood., Growth and general structure of exogenous trees, Seasoning of timber - natural and artificial, Conversion of timber by sawing, Common defects of timber and decay of timber Preservation of timber, Qualities and uses of good timber, Manufacturing and uses of ply woods and different ply boards and laminated boards.	6hr
	REFERENCE BOOKS: 1. Construction Materials Sushil Kumar2. Construction Materials Rangwala	

3DCE03: Surveying-I (Cr, L:T:P:-3,3:1:0)		34hr
	Objective: Surveying or land surveying is the technique, profession, and science of accurately determining the terrestrial or three-dimensional position of points and the distances and angles between them. These points are usually on the surface of the Earth, and they are often used to establish land maps and boundaries	
Unit –I	Introduction :Plane surveying and geodetic surveying, Uses of surveying in engineering., Principles of surveying, Chain Surveying :,Different types of chains, Metric chain, Engineer's chain, Gunter's chain Revenue chain	8hr
Unit –II	Types of Tapes; Linen tapes, Metallic tapes, Invar tapes, Steel band, Ranging rods, Offset rods, Line ranger, Cross staff, Optical square, Arrows, Folding, unfolding, of chains, Testing and adjusting of chains, Ranging, Direct ranging, Indirect ranging, Chaining on plane ground, Conventional signs in surveying, Recording in field book, Chaining on sloping ground, Direct method, Indirect method Common errors and precautions, Traversing, Fixing and marking stations, Base line, Check lines and Tie lines, Common obstacles in chaining, Plotting of traverse, Compass Surveying :, Prismatic compass, Surveyor's compass, Difference in the above two compasses, Definitions, Meridian - magnetic, true, arbitrary, Magnetic dip, Magnetic declination, Fore bearing, Back bearing	8hr
Unit –III	Whole circle bearing system, Quadrilateral bearing system, Conversion from whole circle bearing to quadrilateral bearing and vice versa, Reading the bearing of lines, Computation of internal angles Distribution of instrumental error, Local attraction, Correction of bearings due to local attractions3.13 Traversing with chain and compass. Open Closed Booking in field book Adjustment of error in a closed traverse Leveling :4.1 Definitions4.1 Level surface4.2 Level line4.3 Horizontal line4.4 Vertical line4.5 Mean sea level4.6 Reduced level4.2 Names and function of different parts of -4.2.1 Dumpy level4.2.2 Tilting level4.2.3 Auto level4.3 Difference in dumpy and tilting level.4.4 Internal and external focusing telescope4.5 Temporary adjustments of dumpy and tilting level4.6 Leveling staff4.6.1 Self reading4.6.2 Telescope staff4.6.3 Target staff4.7 Reading a leveling staff4.8 Leveling with dumpy and tilting levels4.8.1 Taking observations4.8.2 Recording in a level book.4.9 Calculation of R.L.4.9.1 Height of instrument method4.9.2 Rise and fall method4.9.3 Arithmetical checks4.10 Types of levelling4.10.1 Fly levelling4.10.2 Differential levelling4.10.3 Profile levelling4.10.4 Reciprocal levelling4.10.5 Precise levelling4.11 Effect of curvature and refraction in leveling and their corrections.4.12 Permanent adjustment4.12.1 Dumpy level4.12.2 Tilting level4.12.3 Automatic level	6hr
Unit –IV	Contouring: 5.1 Concept5.2 Purpose of contouring5.3 Contour interval5.4 Horizontal equivalent5.5 Factors affecting contour interval5.6 Characteristics of contours5.7 Methods of contouring - direct and indirect5.8 Interpolation of contours5.9 Uses of contour maps5.10 Drawing cross sections from contour maps.	6hr
Unit –V	Plane Table Surveying :6.1 Description and uses of plane table and its accessories6.2 Advantages of plane table surveying6.3 Centering, leveling and orientation of plane table6.4 Radiation6.5 Intersections6.6 Traversing6.7 Resection6.8 Two point problems6.9 Three point problems6.10 Errors in plane tabling7. Minor Instrument :7.1 Study and uses of7.1.1	6hr

	Hand level7.1.2 Abney level7.1.3 Clinometer7.1.4 Planimeter7.1.5 Pantagraph7.1.6 Sextent7.1.7 Cylon ghat tracer	
	REFERENCE BOOKS: 1. Surveying B. C. Punmia2. Surveying G. C. Singh3. Surveying Vol. I S.B. Kanetkar4. Surveying K. R. Arora	

3DCE04: Fluid Mechanics (Cr, L:T:P:-3,3:1:0)		38hr
	Objective: Technicians have to deal with pressure measurement, transportation of fluids and the machines converting hydraulic power into mechanical power and vice versa, in the field/industries for that one has to have a basic knowledge of fluid mechanics.	
Unit –I	Introduction:1.1 Introduction concepts1.1.1 Fluids and solids1.1.2 Liquid, gas and vapour1.2 Fluid mechanics1.2.1 Kinematics1.2.2 Dynamics1.3 Fluid properties1.3.1 Density1.3.2 Specific volume1.3.3 Specific gravity1.3.4 Viscosity1.3.4.1 Newton's law of viscosity1.3.4.2 Dynamic and Kinematic viscosity1.3.5 Compressibility1.3.6 Surface tension - soap bubble, drop1.3.7 Capillarity1.3.8 Vapour pressure and its importance2. Fluid Pressure and its Measurement:2.1 Definition and its units2.2 Pascal's law2.2.1 Intensity of pressure at a point in fluid at rest2.2.2 Pressure head2.3 Pressure2.3.1 Atmospheric pressure2.3.2 Gauge pressure2.3.3 Vacuum pressure2.3.4 Absolute pressure2.3.5 Differentials pressure2.4 Law of hydrostatic pressure2.5 Brahma's press2.6 Pressure measurement2.6.1 Manometers2.6.1.1 Piezometer - its limitation 2.6.1.2 U-tube - simple, differential, inverted2.6.1.3 Micro-manometers2.6.1.4 Inclined tube micro-manometers2.6.2 Mechanical gauge2.6.2.1 Bourdon gauge2.6.2.2 Bellow gauge2.6.2.3 Diaphragm gauge2.6.2.4 Dead weight gauge	8hr
Unit –II	Hydrostatics:3.1 Total pressure3.2 Centre of pressure3.3 Total pressure and center of pressure in following cases3.3.1 Plane surface immersed horizontally3.3.2 Plane surface immersed vertically3.3.3 Plane surface immersed at an angle3.3.4 Curved surface (no proof)3.4 Working of lock gates, sluice gate3.5 Pressure on masonry dams of rectangular and trapezoidal sections and their condition of stability4. Hydro kinematics :4.1 Description of fluid flow4.1.1 Euler approach4.1.2 Lagrangian approach4.2 Definition of path line, stream line4.3 Types of flow4.3.1 Steady - Non steady4.3.2 Uniform - Non uniform4.3.3 Laminar - Turbulent4.3.4 One, Two, Three dimensional flow4.4 Continuity equation (no proof) :4.4.1 Assumption4.4.2 Rate of discharge4.4.3 one dimensional flow	8hr
Unit –III	Hydrodynamics and Measurement of Flow:5.1 Energy of fluid - pressure, kinetic and potential5.2 Bernoulli's theorem (no proof)5.2.1 Assumptions and its limitation5.2.2 Conversion of pressure into pressure head, velocity into kinetic head5.3 Applications of Bernoulli's theorem5.3.1 Pitot-tube5.3.2 Venturimeter5.3.3 Orifice meterOrifices and Notches:6.1 Definition and classification6.2 Discharge through small orifices6.2.1 Coefficient of contraction6.2.2 Coefficient of velocity6.2.3 Coefficient of discharge6.2.4 Coefficient of resistance6.3 Time of emptying a vessel of uniform cross section through an orifice at bottom.6.4 Notches - Classification6.4.1 Crest, Nappe6.4.2 Difference between notch and weir6.5 Flow over -6.5.1 Triangular notch6.5.2 Rectangular notch[Simple numerical problems without velocity of approach]	8hr
Unit –IV	Flow Through Pipes:7.1 Laws of fluid friction.7.2 Losses of head in pipes7.3 Hydraulic gradient line.7.4 Total energy line.7.5 Flow through pipes in series.7.6 Equivalent length7.7 Flow through parallel pipes (No branched pipes)7.8 Flow through siphon7.9 Definition of water hammer and its effect (No mathematical calculations)8. Flow through Channels:8.1 Types of flow8.1.1 Uniform and Non uniform flow, difference in pipe and channel flow.8.2 Classification of an open channel8.3 Formula for uniform flow in open channels8.3.1. Chezy's formula8.3.2. Kutter's formula8.3.3. Bazin's formula8.3.4. Manning's formula8.4	8hr

	Factors affecting roughness co-efficient8.5 Values of roughness co-efficient for different channel conditions8.6 Most economical section of channel -8.6.1 Rectangular section8.6.2 Triangular section8.6.3 Trapezoidal section8.6.4 Circular section8.7 Specific energy of flow in a channel at a cross section8.8 Explanation of the terms -8.8.1 Critical depth8.8.2 Critical flow8.8.3 Sub-critical flow8.8.4 Super-critical flow8.8.5 Hydraulic jump8.9 Measurement of flow in open channel by -8.9.1 Surface slope measurement8.9.2 Velocity measurement8.9.3 Flow measurement	
Unit –V	Turbines :9.1 Introduction9.2 Classification of turbines9.3 Working principles of impulse and reaction turbine9.4 Constructional detail and working of different types of turbines (No mathematical analysis.)9.4.1 Pelton wheel turbine9.4.2 Francis turbine9.4.3 Kaplan turbine10. Pumps :10.1 Classification of pumps10.2 Constructional detail of reciprocating pump10.3 Constructional detail of centrifugal pump10.4 Comparison of reciprocating and centrifugal pump10.5 Brief description of submersible pump and deep well turbine pump10.6	6hr
	Installation and maintenance of pumps	38hr
	REFERENCE BOOKS:1. Hydraulics Modi & Seth2. Hydraulics K. R. Arora3. Hydraulics Anand & Kulsrestha4. Hydraulics B. L. Gupta5. Fluid Mechanics & Machines Dr. Jagdish Lal6. Fluid Mechanics & Machines Dr. R.K.Bansal7. Fluid Mechanics & Machines R.S.Khurmi.8. Hydraulics & Pneumatics H.L. Stewart.	

3DCE05: Environmental Engineering (Cr, L:T:P:-3,3:1:0)		
	Objective: Environmental engineering is application of science and engineering principles to improve the natural environment (air, water, and/or land resources), to provide healthy water, air, and land for human habitation (house or home) and for other organisms, and to remediate polluted sites. It also includes studies on the environmental impact of proposed construction projects	
Unit –I	Environment and Ecology: 1.1 Definition and understanding of their concept1.2 Ecosystem1.3 Energy flow in an ecosystem1.4 Important bio chemical cycles (water, carbon, oxygen)1.5 Communities relationship in an eco system2. Factors Affecting Environmental Pollution :2.1 Population2.2 Urbanisation2.3 Industrialisation2.4 Transportation2.5 Insecticide2.6 Animals2.7 Wars2.8 Deforestation	8hr
Unit –II	Water Pollution :3.1 Fresh water3.1.1 Causes of water pollution in surface and ground water3.1.2 Water quality standards3.1.3 Remedial measures to control fresh water pollution3.2 Waste water3.2.1 Adverse effects of domestic and industrial effluents3.2.2 Standards for industrial effluents3.2.3 Remedial measures to control industrial pollution4. Air Pollution :4.1 Definition4.2 Sources4.3 Harmful effects on living and non living beings4.4 Permissible limits as per Indian standard4.5 Remedial measures Noise Pollution :5.1 Introduction5.2 Sources of noise5.3 Decibel scale5.4 Adverse effect on human beings and environment5.5 Control measures	8hr
Unit –III	Land Pollution: 6.1 Introduction6.2 Sources of land pollution6.3 Effects of land pollution6.4 Control measures6.5 Soil conservation7. Environmental Impact Assessment (EIA) :7.1 Introduction7.2 E.I.A. of thermal power plants, mining and nuclear radiation	8hr
Unit –IV	Global Environmental Issues: 8.1 Deforestation8.2 Land sliding8.3 Recharging and drying of water resources8.4 Green house effects8.5 Ozone depletion8.6 Acid rain8.7 Global warming9. Non Conventional Sources of Energy in Environmental Protection	8hr
Unit –V	Pollution Control Acts: 10.1 Water Pollution Control Act 1974 and 198110.2 Air Pollution Control Act 198110.3 Forest (Animal) Conservation Act 197210.4 Environmental Protection Act 198610.5 Pollution Control provisions in Motor Vehicle Act11. Environment Laws :11.1 Water Pollution Prevention and Control Act11.2 Air Pollution Prevention and Control Act	6hr
	Text Books:-REFERE_CE BOOKS: 1. An Overview of Environment Engg. Kapoor2. Water Supply & Sanitary Engg. Birdie & Birdie	

3DCE06:- Strength of material Lab -I(Cr, L:T:P:-2,0:0:2)	
	Objective: The resultant of forces, power transmission and force distribution is studied in this Lab
	1. Study of extensometers 2. Study and operation of UTM 3. Tensile test on mild steel specimen and plotting stress strain curve. 4. Bending test on timber beams. 5. Compression test on common structural materials viz. timber, cast iron etc.
3DCE07: Construction material & Equipment Lab-I (Cr, L:T:P:-2,0:0:2)	
	Objective: The different properties of the materials and their geology is studied in this Lab
	1. Identification of common rocks and minerals 2. Dimension, water absorption and efflorescence tests of bricks 3. Dimension, water absorption test of tiles 4. Field test of lime 5. Laboratory test of lime as per B.I.S.6. Identification of common Indian timbers, plywood and laminated board

3DCE08: Surveying Lab-I (Cr, L:T:P:-2,0:0:2)		
	Objective:- To determine the magnetic bearing of a line, To determine the reduced levels, Measurement and adjustment of included angles.	
3DCE09: Fluid Mechanics Lab (Cr, L: T:P:-,:)		
	Objective:- Properties of the Fluids, flow of fluids are tested in this lab	
	Study of. Different types of chains and tapes. Cross staff. Optical square. Line ranger. Use of Chains; . Folding and unfolding. Ranging and chaining on plane and sloping surface. Setting right angles.. Setting parallel lines.. Taking offsets.. Chain surveying of small areas. Study of prismatic compass. Study of surveyor compass. Measurements of bearing of lines. Transverse by compass and adjustment of error. Study of the component parts and handling of. Dumpy level. Tilting level. Staves. Temporary adjustments of a dumpy level and a tilting level. Use of dumpy level and tilting level in differential leveling and leveling for cross section and longitudinal section. Recording in level book and plotting.. Study of Automatic level.. Study and use of plane table and its accessories e.g. stand, table, clamping arrangement, sight vane, through compass, plumbing fork, plumb bob, sprit level etc.. Methods of plane tabling. Radiation. Intersection. Traversing. Resection. Two and three point problems. Preparation of a plan on area by plane table survey.. Plotting spot levels of a given area by the grid method and interpolation of contours.. Preparations of a contoured plan of an uneven area with the help a level and a plane table.. Study of. Hand and abney level. Clinometers. Planimeter. Pantograph. Sextant. Cylon ghat tracer.. Ranging and Fixing of Survey Station.	
3DCE10: Building Drawing (Cr, L:T:P:-,:)		
	Objective: The plan for designing of the different structure is performed in this Lab	
	. Detailed working plan, elevation and section of the following.. Two bed room residential building. Panchayat bhawan. Community hall. Polytechnic college building. Office building. Fifty bed hospital at district headquarter. Drawing of a small residential building from measurements.. Detailed working plan, elevation and section through stair-case drawing of a two storied building	

SEMESTER –IV		
4DCE01: Strength of Materials-II (Cr, L:T:P:-,::)		38hr
	Objective: In Engineering every structure or machine element is designed for a particular application. Then it is tested. A Degree holder should be capable of designing the various elements for particular requirements. For this he must be able to calculate the stresses in an elements and their nature	
Unit –I	Shear Stress in Beams: Concept, Use of equation (Ay) , Shear stress distribution diagram of various sections ,Rectangle, I section ,T section ,Channel section ,H section ,+ section Circular section Deflection: Concept of deflection of a beam ,Use of standard formula for calculating deflection (for point loads, U.D.L. and their combination) ,Cantilever beam ,Simply supported beam	8hr
Unit –II	Columns and Struts: Concept of column and struts, Modes of failure, Types of column; long and short, Buckling loads, Slenderness ratio, Euler's formula (without proof), Both ends hinged, One end fixed and other end free, Both ends fixed, One end fixed and other end hinged, Limitations of Euler's Formula, Equivalent length, Rankine's formula.	6hr
Unit –III	Torsion of Shaft: Concept of torsion, Angle of twist, Polar moment of Inertia, Assumptions in the theory of pure torsion, Derivation and use ofq/r=T/J=N/l□, Relation between power and torque, Combined stress due to bending and torsion in solid and hollow shaft.	8hr

Unit –IV	Springs :. Introduction and classification of springs. Flat carriage springs.. Application of flat carriage springs.. Determination of number of leaves and their sections, deflection and radius of curvature.. Quarter elliptical spring. Closely coiled helical springs :.. Application of closely coiled helical springs.. Determination of deflection, angle of twist, number of coils and stiffness under axial loading in closely coiled helical springs.	8hr
Unit –V	Thin Cylindrical Shells :. Use of cylinders. Stresses due to internal pressure.. Circumferential stress or hoop stress.. Longitudinal stress. Design of thin cylinders - calculation of the various dimensions of a thin cylinder. Combined Direct and Bending Stress:. Effect of eccentricity. Stress due to eccentric load. Middle third rule. Quarter rule	8hr
	1. Text Books;E. P. Popov, Engineering Mechanics of Solids, Prentice hall of India Pvt. Ltd. S. P. Timoshenko and D. H. Young, Elements of Strength of Materials, Affiliated East West Press Pvt. LtdStrength of materials by B.C.PunamiaReference books; H. Shames, Introduction to Solid Mechanics, Prentice hall of India Pvt. Strength of materials by Ramamurtham	

4DCE02: Concrete Technology (Cr, L:T:P:-,::)		38hr
	Objective: Surveying or land surveying is the technique, profession, and science of accurately determining the terrestrial or three-dimensional position of points and the distances and angles between them. These points are usually on the surface of the Earth, and they are often used to establish land maps and boundaries	
UNIT-I	Cement :. Manufacture of Portland cement. Chemical composition. Hydration of cement Types of cement.. Ordinary Portland cement.. Rapid hardening cement.. Extra rapid hardening cement.. Sulphate resisting cement.. Blast furnace cement.. Quick setting cement.. Super sulphate cement.. Low heat cement.. Portland pozzolona cement.. White cement.. Hydrophobic cement.. Oil-well cement.. High alumina cement. Testing of cement.. Field testing.. Fineness test.. Specific gravity of cement.. Standard consistency test.. Setting time test.. Strength test.. Soundness test. Aggregates :. Classification of aggregates according to sources. Shape, size and texture. Bulk density. Specific gravity. Water absorption and moisture content. Bulking of aggregate. Alkali - aggregate reaction. Grading of aggregates. Sieve analysis. Standard grading curve. Specified grading. Gap grading. Flakiness index. Elongation index. Fineness modulus. Crushing value. Ten percent Fines value. Water :. Indian Standards for quality of water for use in cement concrete.. Effect of impurities in water on concrete	8hr
UNIT-II	. Admixtures and Construction Chemical:. General. Admixtures.. Plasticizers.. Super plasticizers.. Retarders.. Accelerators.. Air entraining admixtures.. Pozzolanic or mineral admixtures.. Air detraining admixtures.. Alkali aggregate expansion inhibitors.. Workability admixtures.. Grouting admixtures.. Bonding admixtures. Construction chemicals.. Concrete curing compounds.. Polymer bonding agents.. Floor hardener and dust proofers.. Surface retarders.. Bond aid for plastering.. Ready to use plaster.. Guiniting agents.. Water proofing. Fresh Concrete:. Workability. Factors affecting workability. Measurement of workability.. Slump test.. Compacting factor test.. Vee-Bee consist meter test. Segregation. Bleeding. Process of manufacture of concrete	8hr
UNIT-III	Concrete Operation:. Batching.. Volume batching. Weight batching. Mixing.. Hand mixing.. Machine mixing. Transporting of concrete.. Mortar pan.. Wheel barrow.. Bucket and rope way.. Truck mixer and dumpers.. Belt conveyors.. Chute.. Skip and hoist.. Pumps and pipeline. Placing concrete. Compaction of concrete.. Hand compaction.. Compaction by vibrators. Types of vibrators and its uses. Curing of concrete.. Water curing.. Membrane curing.. Steam curing. Finishing.. Formwork finishes.. Requirements of good finish. Joints in concrete.. Construction joints.. Expansion joints.. Contraction joints.. Isolation joints	8hr
UNIT-IV	Strength of Concrete:. Water cement ratio. Gain of strength with age. Relation between compressive and tensile strength. Bond strength. Aggregate cement bond strength. Special Concrete:. Light weight concrete. No fines concrete. Aerated concrete. High density concrete. Fiber reinforced concrete. Polymer concrete. Gunite or shot concrete. RMC (ready mixed concrete). Ferro cement. High Performance	8hr

	concrete. Formwork:. Requirements of formwork. Types of formwork. Time for stripping formwork.	
UNIT-V	. Quality Control at Site:. Factors causing variations in the quality of concrete. Field control. Statically quality control. Frequency of test. Concrete Mix Design :. Concept. Variables in proportioning. Indian Standard recommended method for concrete mix design IS-Deterioration and Restoration of Concrete :. Introduction. Internal and external causes of deterioration of concrete. Prevention of deterioration of concrete.. Corrosion of reinforcing steel – causes & prevention.. Maintenance & repair –.. Repair materials – mortar, grouts, concrete, gunite, bonding agent, protective coating on concrete surface and protective coating on reinforcement.. Repair measures – assessment of damage, possible repair measures, structural strengthening.. Repair of cracks and honey combs	6hr
	Text Books-M. Neville, J. J. Brooks, Concrete Technology, Low Priced Edition, Pearson Education, . R. Santhakumar, Concrete Technology, Oxford University Press, .Reinforced Concrete Design by P. Dayaratnam Reference books: . M. S. Shetty, Concrete technology- Theory & Practice, S. Chand & Company New Delhi, . . M. L. Gambhir, Concrete Technology, Tata McGraw Hill Publishing Company Ltd.,	
		38hr

4DCE03: Soil & Foundation Engg.-(Cr, L:T:P:-,::)		
	Supervision of earth work in construction at dams, roads, embankments and other structures is an important function of a Civil Engg. diploma holder. For this the basic knowledge of Soil Engg. is essential. This subject covers such topics as will enable the diploma holder to identify and classify the different types of soils, their selection and proper use in the field of engineering construction. To develop related skills suitable laboratory work is also recommended	
UNIT-I	Introduction :. Introduction and scope of soil engineering. Origin and formation of soils. Major soil deposits of India. Fundamental Definitions and Relationships:. Representation of soil as a three phase system. Definition of moisture content, unit weights, density, and specific gravity, void ratio, porosity, degree of saturation and the relationship among them.. Classification of Soils :. Classification of soils as per particle size and plasticity chart according to IS specifications. Particle size distribution - Sieve analysis. Consistency of soils – Liquid limit, Plastic limit and Shrinkage limit. Field identification	8hr
UNIT-II	. Permeability of Soils:. Definition of permeability and related terms. Darcy's law of flow through soils. Factors affecting permeability. Measurement of permeability in laboratory. Measurement of permeability in field. Compaction :. Process of compaction. Proctor's compaction test. Moisture content and density relationships. Factors affecting compaction. Different methods of compaction. Brief description of field compaction methods, equipments and suitability for different type of soils.. Consolidation:. Meaning and explanation of phenomena. Total stress, neutral stress and effective stress. Measurement of compressibility characteristics. Consolidation test. Pressure voids ratio relationship in consolidation. Practical methods of accelerating consolidation. Normally consolidated and over consolidated soil	8hr
UNIT-III	Shear strength: Concept of shear strength. Factors contributing to shear strength of soils.. Drainage conditions of testing.. Determination of shearing strength by direct shear test, unconfined compression test, vane shear test.. Bearing Capacity:. Concept of bearing capacity. Terzaghi's beating capacity factors and bearing capacity as per IS code. Factors affecting bearing capacity.. Determining bearing capacity of soil by plate load test and Standard Penetration Test.. Methods of improving bearing capacity	8hr
UNIT-IV	Earth Pressures:. Active and passive earth pressure. Earth pressure at rest. Determination of earth pressure by Rankine's theory for cohesion less soil (No derivation). Soil Exploration :. Functions and scope of soil exploration. Excavation and boring methods of sub-surface exploration. Types of samplers. Disturbed and undisturbed samples. Leveling, sealing and preservation of samples	8hr
UNIT-V	Foundation :. Introduction to different types of foundation.. Shallow foundation.. Deep foundation.. Raft foundation.. Well foundation. Pile Foundation:. Definition of pile foundation. Places of application. Classification of piles based on functions and materials.. Formula related to pile foundations –.. Static formula.. Dynamic engineering news formula.. Haley's formula Soil Stabilization :. General principles of soil stabilization. Different types of soil stabilization –.. Mechanical Stabilization..	6hr

	Water reluctant chemicals.. Cement stabilization.. Lime stabilization.. Bitumen stabilization.. Stabilization by grounting	
	1. Text Books:REFERENCE BOOKS :. Soil Engg B.C. Punmmia. Basic Soil Engg. Dr. Alam Singh. Modern Geo- Technical Engg. Alam Singh. Soil and Foundation Engineering (Hindi) B.C. Punmia. Soil and Foundation Engineering (Hindi) B.L.Gupta.. Soil Mechanics(Hindi) Janardan Jha	

4DCE04: Building technology (Cr, L: T: P:-,::)		26hr
	Objective: Building construction is an important job of Civil Engineering diploma holder. So he must acquire the knowledge of various parts of the building, their functions, importance and procedure of construction and maintenance. Building technology includes all the aspects of construction and importance of building work.	
UNIT-I	Introduction:. Definition of a building. Classification of building based on occupancy. Explanation of different parts of a building. Foundation:. Concept of foundation. Factors affecting selection of foundations. Definition and importance of bearing capacity, Average bearing capacity of common soils.. Types of foundations- shallow and deep foundations. Shallow foundation- spread footings, raft and inverted arch foundation. Rankine's formula for depth of foundations. Deep Foundation - Pile foundation, their suitability, Classification of piles according to function, material and installation. Causes of failure of foundation and remedial measures.. Walls :. Purpose of walls. Types of walls- Load bear, non-load bearing. Partition walls - construction details, suitability and use of brick and wooden partition walls.. Cavity walls - Brief description and constructional detail of cavity walls. Brick Masonry:. Definition related to brick masonry. Bond, necessity of bond. Types of bonds- English, Flemish, header and stretcher, T-junction, corner junction.. Sketches for , ½ and -brick thick wall and square pillars. Construction of brick walls-method of laying brick in walls and precautions to be taken for it.	6hr
UNIT-II	Stone Masonry :. Definition related to stone masonry. Dressing of stones - Hammer dressing, chisel dressing. General principles for construction of stone masonry. Brief description and sketches of different types of stone masonry- Ashlar, random rubble and coursed rubble. Ashlar facing to coursed, rubble and brick masonry.. Brief description, sketches and uses of joggles, dowells and cramps in stone masonry.. Scaffolding, Shoring and Underpinning :. Brief description and application of different types of scaffolding and shores.. Meaning and need for underpinning Dampness and its Prevention:. Causes of dampness in buildings and principles of its prevention.. Materials commonly used for damp proofing.. Damp proof course. Anti termite treatment of buildings before and after construction. Arches and Lintels :. Meaning and uses of arches and lintels. Glossary of terms related to arch and lintels. Thickness of lintels, Effective span. Type of arches e.g. semi circular, segmental arches, elliptical, pointed, relieving arch, flat arch.. Thickness of semi-circular and segmental arches by empirical rules.	4hr
UNIT-III	Doors :. Types of door frames - stone, timber, steel, concrete. Description and sketches of different types of doors ledged, battened and braced door, framed empanelled door, glazed and panelled doors, louvered doors, flush doors.. Use of collapsible door, rolling steel doors, side sliding doors, wire mesh doors.. Windows:. Names, uses and sketches of - fully paneled window, fully glazed windows. Casement and pivoted window, dormer window, clearstory window, skylight, fanlight and ventilators. Window frames of different materials- wood, steel, aluminum.. Stairs and Stair Cases :. Glossary of terms related to stairs. Brief description and sketches of common types of staircase : Straight flight, Quarter turn, Half turn doglegged and open newel, Bifurcated, Circular, Spiral. Classification of staircases according to materials used.. Rise, Tread & Going of	6hr

	the different type of stair.. Roofs :. Functions of roofs and ceilings. Brief description, constructional details and suitability of common types of roofs.. Definition of terms for pitched roofs, principal rafter, common rafter, jack rafter, hip rafter, valley rafter, ridge piece, caves, purlins, cleats, wall plates, valley gutter, side gutter, gable, facia board.. Roof coverings for pitched roofs - Asbestos cement and C.G.I. method of arranging and fixing to battens, rafters, purlins both steel and wooden.. Drainage arrangement for pitched and flat roofs.	
UNIT-IV	Floors:. Ground floors. Brief description, uses and construction of ground floors - Brick on edge; tiles, stone slab, marble and glazed tiles, lime concrete, cement concrete, terrazzo and mosaic.. Finishing of buildings :. Different types of plastering, rendering and painting. Methods of plastering, and curing. Defects in plasters and repairs of the defects.. Different types of painting uses and methods of painting. White washing, colour washing and distempering- water and oil bound distempers. Application of cement plastic paints. Provision of expansion joints in building floors, walls and roofs.. Building Bye Laws :. Study of building bye laws as per IS -. Terminology related to residential building, building permit occupancy certificate, unsafe buildings, enforcement code, offences and penalties.. Health sanitation and other requirements, means of access, open space requirements, plinth area, projections, covered area in residential plots.. Distance from electric lines, plinth regulation, height regulation, size of rooms, lighting and ventilation, construction of water closets, kitchen, mezzanine floor, stair cases, drainage and sanitation	4hr
UNIT-V	Basic Principles of Building Planning:. Aspect, prospect its internal circulation, privacy grouping (i) living areas (ii) sleeping areas and (iii)working areas. Roominess, flexibility, furniture setting, sanitation elegance and economy. Arrangement of doors, windows, cupboards etc for a residential building. Orientation :. Orientation of buildings as per I.S. in relation to sun and wind directions, rain, internal circulation and placement of room, commensurate with available areas and requirements.. Preparation and study of sun chart on polar graphs. Sun shading devices-types sketches suitability, for different orientations.. Site Selection :. Selection of site for a building and building complex. Comparative study of sites with respect to local topography, flooding, soil access, location. Communication links, with surroundings availability of water and electricity, prevailing wind, made up ground, water table, trees etc.. Design of Buildings:. Common standards for floor space and cubical contents for residential building and public building (Schools, Hostels, Dispensaries, Panchayatghars).. Economical design of single room tenements, double room tenement and residential flats. Design of a residential building and public buildings (School, Hostel, Dispensary, Panchayatghar) including location of water supply line, drainage line and placing of electrical fittings.. Details of a toilet, kitchen and staircase for modern residential buildings	6hr
	Text books; . Building Construction Bindra & Arora... Building Construction Sushil Kumar.. Building Construction B.C. Punamia	

4DCE05: Construction Material& equipment-II(Cr, L:T:P:-,::)		26hr
	Objective-Construction materials are an important part of Civil Engineering. A Civil Engg. diploma holder should have the thorough knowledge about different materials, useful for constructions. Diploma holder should know the properties of different materials used in Civil Engineering .	
UNIT-I	Ferrous Material :. Pig iron. Cast iron. Wrought iron. Steel.. Classification.. Heat Treatment. Structural steel. Non Ferrous Metals:. Aluminum. Copper. Zinc. Galvanized. Corrosion of Metals.. Mechanism and prevention	6hr
UNIT-II	Glass :. Properties. Types of Glass. Industrial forms of glasses. Paints and Varnishes:. Classification of paints - oil paints, plastic paints, enamel paints, water paints and cement paints.. Constituent materials of paints. Preparation and uses of different paints. Constituents, properties and uses of varnish and polish - spirit polish and wax polish.. Different types and use of exterior paints	4hr
UNIT-III	Equipment for Earth Work and Compaction:. Bull Dozers. Scraper. Loaders. Excavator. Shovels. Cranes. Static Compaction Equipment. Vibratory compaction equipment. Rubber tyred compaction equipment. Road Rollers. Bitumen or Asphalt Mixing Plant :. Hot mix plant. Cold Mix plant. Paver finisher. Bitumen distributors. Road Marking machine	6hr
UNIT-IV	Hauling Equipment. Different Types of dumpers. Trailers Equipment for Concreting :. Concrete batching and mixing plant. Concrete mixer. Truck – mixers – transit truck mixers, truck agitators. Concrete pumps and dumpers. Concrete paver finis	4hr
UNIT-V	Timber :. Standing timber, rough timber, converted timber, exogenous trees, endogenous trees, softwood and hardwood.. Growth and general structure of exogenous trees. Seasoning of timber - natural and artificial. Conversion of timber by sawing. Common defects of timber and decay of timber. Preservation of timber. Qualities and uses of good timber. Manufacturing and uses of ply woods and different ply boards and laminated boards	6hr
	Text Books:. Construction Materials Sushil Kumar. Construction Materials Rangwala	

4DCE06: Strength of Material Lab -II (Cr, L:T:P:-,::)		
	Objective: The resultant of forces, power transmission and force distribution is studied in this Lab	
	. Determination of toughness of cast iron and mild steel specimen by Charpy and Izod test.. Hardness test by Brinell and Rockwell test.. Determination of deflection for various types of loading. Torsion test on brass and mild steel. Determination of stiffness of close coiled spring	
4DCE07: Construction Material & Equipment lab-II(Cr, L:T:P:-,::)		
	. Identification of common rocks and minerals. Dimension, water absorption and efflorescence tests of bricks. Dimension, water absorption test of tiles. Field test of lime. Laboratory test of lime as per B.I.S.. Identification of common Indian timbers, plywood and laminated boards	
4DCE08: Concrete Lab. (Cr, L:T:P:-,::)		
	. Determination of specific gravity of cement.. Determination of consistency of cement. Determination of Initial and Final setting time of cement.. Determination of fineness of cement. Determination of soundness of cement. Determination of compressive strength of cement. Determination of specific gravity and water absorption of aggregates. Determination of flakiness index and elongation index of aggregates. Determination of Bulk density of aggregates. Determination of fineness modules and grain size distribution. Determination of bulking of fine aggregate. Test for workability. Slump test. Compaction factor test. Vee-Bee test. Determination of strength of cement concrete.. Mix Design of M- by IS code method (IS-)	
	REFERENCE BOOKS :. Concrete Technology P.D. Kulkarni. Concrete Technology M.S Shetty. Concrete Technology Varshney.. Concrete Technology (Hindi) G. Das & B.L.Gupta. Concrete Manual M.L. Gambhir. Code IS--	
4DCE09: Soil & Foundation Engg. Lab (Cr, L:T:P:-,::)		
	. Determination of moisture content. Determination of specific gravity of soils. Grain size analysis (by sieve analysis). Determination of liquid and plastic limits of soils. Determination of field density by core cutter method. Determination of field density by sand replacement method. Proctor's compaction test. Constant head and falling head permeability test.. Determination of shear strength from direct shear test. Determination of unconfined compression strength test.. Conduct of SPT. Soil sampling by auger and tube sampler	
	REFERENCE BOOKS :. Soil Engg B.C. Punmmia. Basic Soil Engg. Dr. Alam Singh. Modern Geo- Technical Engg. Alam Singh. Soil and Foundation Engineering (Hindi) B.C. Punmia. Soil and Foundation Engineering (Hindi) B.L.Gupta.. Soil Mechanics(Hindi) Janardan Jha	
4DCE10: Computer Aided Drawing (Cr, L:T:P:-,::)		
	Getting Started – I Starting AutoCAD – AutoCAD screen components – Starting a drawing: Open drawings, Create drawings (Start from scratch, Use a template & Use a wizard) – Invoking commands in AutoCAD – Drawing lines in AutoCAD –Co-ordinate systems: Absolute co-ordinate system, Relative co-ordinate system – Direct distance method – Saving drawing: Save & Save As – Closing a drawing – Quitting AutoCAD. Getting Started – I Opening an existing file – Concept of Object – Object	

	selection methods: Pick by box, Window selection, Crossing Selection, All, Fence, Last, Previous, Add, Remove – Erasing objects: OOPS command, UNDO / REDO commands– ZOOM command – PAN command, Panning in real time – Setting units – Object snap, running object snap mode– Drawing circles. Draw Commands ARC command – RECTANG command – ELLIPSE command, elliptical arc – POLYGON command (regular polygon) – PLINE command – DONUT command – POINT command – Construction Line: XLINE command, RAY command – MULTILINE command. Editing Commands MOVE command – COPY command – OFFSET command – ROTATE command – SCALE command – STRETCH command – LENGTHEN command –TRIM command – EXTEND command – BREAK command – CHAMFER command – FILLET command – ARRAY command – MIRROR command –MEASURE command – DIVIDE command – EXPLODE command – MATCHPROP command – Editing with grips: PEDI Drawing Aids Layers – Layer Properties Manager dialog box – Object Properties: Object property toolbar, Properties Window– LTSCALE Factor – Auto Tracking – REDRAW command, REGEN command. Creating Text Creating single line text – Drawing special characters – Creating multiline text – Editing text – Text style. Basic Dimensioning Fundamental dimensioning terms: Dimension lines, dimension text, arrowheads, extension lines, leaders, cent remarks and centerlines, alternate units – Associative dimensions – Dimensioning methods – Drawing leader. Inquiry Commands AREA – DIST – ID – LIST – DBLIST – STATUS – DWGPROPS. Editing Dimensions Editing dimensions by stretching – Editing dimensions by trimming & extending – Editing dimensions: DIMEDIT command – Editing dimension text: DIMTEDIT command – Updating dimensions – Editing dimensions using the properties window – Creating and restoring Dimension styles: DIMSTYLE. Hatching HATCH, HATCH commands – Boundary Hatch Options: Quick tab, Advance tab – Hatching around Text, Traces, Attributes, Shapes and Solids – Editing Hatch Boundary – BOUNDARY command. Blocks The concept of Blocks – Converting objects into a Block: BLOCK, _BLOCK commands – Nesting of Blocks –Inserting Blocks: INSERT, MINSERT commands – Creating drawing files: WBLOCK command – Defining Block Attributes – Inserting Blocks with Attributes – Editing Attributes. Plotting Drawings in AutoCAD PLOT command – Plot Configuration – Pen Assignments – Paper Size & Orientation Area – Plot Rotation & Origin– Plotting Area – Scale. Draw working plan, elevation of the following.. Three bed room duplex bungalow with the given plot size. Detailed plan of above showing house drainage, water supply and electrical fittings as per BIS.. Hostel building. School building	
	. AutoCAD for Windows Bible (with Applications) / Sham Tickoo / Galgotia Publications Pvt. Ltd.. Advanced AutoCAD Robert M. Thomas / Sybex BPD. AutoCAD Part – & Banglay Prokashito Tutorial / CD Media / Sonolite, , Elliot Road, Kolkata	

SEMESTER –V		
5DCE01: Construction Management and accounts (Cr, L:T:P:-,::)		34hr
	A junior engineer is responsible for the management of a construction job at site. He is required to instruct the workmen, arrange the materials, tools and plants before carrying out any construction activity. He is also supposed to make payments to workmen and handle some govt. money. So this subject provides all the necessary know how for the systematic work and guidance to the diploma holders. Safety relating to civil works is also included in the contents	
Unit –I	Introduction :. Different types of construction. Stages in construction from conception to realization. Construction team - owners, engineer and contractor. Construction management.. Necessity.. Resources - men power, machines, materials, money and management.. Function of construction management-planning, organizing, staffing, directing, controlling and coordinating.. Joint venturing and BOT (Build Operate and Transfer) projects	6hr
Unit –II	Construction Planning :. Construction project planning. Stages in planning. Bar charts. Introduction to Network. Planning and scheduling by bar charts. Limitations of bar chart. PERT and CPM. Network construction. Determination of project schedule and critical path of a network for different cases. Resource allocation and cost time balancing.	8hr
Unit –III	. Organization :. Types of organization.. Line, functional and line & staff and their description chart.. Advantages, disadvantages and applications of various organization.. Principles of organization.. Site organization.. Principles of storing and stacking materials at site.. Location of equipments.. Introduction of job layout and factors influencing it. Construction Contracts :. Introduction. Proposal and agreements. Types of construction contracts : lump sum contract, rate contract, cost plus contracts, turnkey contracts. General conditions of contracts. Contract labour act	6hr
Unit –IV	1.1 Construction Labour .Condition of construction workers in India. Wages paid to workers. Trade unions. Trade union act. Important provisions of Minimum Wages Act. Productivity in construction. Workman's Compensations Act. Inspection and Quality Control :. Technical services required for inspection. Quality construction. Quality control operation. Quality control in concreting, earthwork and other constructions.. Methods of recording progress of a project	6hr
Unit –V	Construction Safety :. Meaning and scope. Legal requirements. Causes and effects of accidents. First Aid. First prevention. Safety programme. Safety training. Public Works Accounts :. Payment to labourers. Payment to contractors and suppliers. Standard measurement book. First and final bill. Running account bill. Advance payments. Hand receipt form no. . General instructions for preparation of bills. Payment to work-charged establishment. Imprest account. Temporary advance account. Treasury challan. Cash book	8hr
	Text books:. Construction Management & Accounts Vazrani & Chandola. Construction Management & Accounts H. Singh- (TMH).. Estimating Costing & Specification in Civil Engg. M.Chakraborti. Estimating Costing & Specification in	

	Civil Engg. S.Dutta.. Construction Management & Equipment B.L. Gupta.. Construction Equipment Dr. Mahesh Verma.. Construction Planning & Equipment Peuirtoy Mc. Graw Hill. Construction Planning & Equipment Satya Narayannn & Sushma Saxena. Construction Management & Equipment Subhash Sharma & Khanna.. PERT & CPM Dr. P.N. Modi.. Construction Management, Equipments & Accounts (Hindi) M.R.Choudhary	

5DCE02 : Theory of Structures (Cr, L:T:P:-,::)		36hr
	Objective: Structural engineering is a field of engineering dealing with the analysis and design of structures that support or resist loads. Structural engineering is usually considered a specialty within civil engineering, Structural engineers must ensure their designs satisfy given design criteria, predicated on safety	
UNIT-I	Frames :. Different types of frames. Calculation of forces in the members of determinate frames.. Method of Joints.. Method of section. Slope and Deflection:. Calculation of slope and deflection in simply supported and cantilever beams, loaded with point and uniformly distributed load by.. Double integration method.. Macaulay's method.. Area moment method	8hr
UNIT-II	. Propped Cantilever Beam :. Concept. Drawing of B.M.D. and S.F.D. for propped cantilever beams loaded with point loads and U.D.L.. Slope and deflection for point loads and U.D.L.. Fixed Beams :. Concept. Drawing of BMD and SFD using Mohr's theorem	6hr
UNIT-III	Continuous Beams:. Drawing of BMD and SFD for continuous beams loaded with point load and UDL using Claypeyron' stheorem of three moments. Rolling Loads:. Drawing of maximum B.M.D. and S.F.D. for simply supported beam for rolling loads of.. Single concentrated load.. Two point loads.. Series of point loads.. U.D.L. longer than span.. U.D.L. shorter than span	8hr
UNIT-IV	. Influence Line Diagram for the following in Simply Supported Beams:. Reaction. Shear force. Bending moment. Three Hinged Arch :. Introduction. Reactions of symmetrical parabolic arch. S.F.D. & B.M.D. of symmetrical parabolic arch	8hr
UNIT-V	. Retaining Walls :. Types of retaining walls. Stability of retaining walls. Indeterminate Structures :. Types of indeterminacy. External and internal. Degree of indeterminacy in beams and pin jointed frames	6hr
	1. Text Books:-L. S. Negi, Theory and Problems in Structural Analysis, Tata-McGraw HilB.C.Punamia, Indeterminate Structural Analysis, Narosa Publishing House, l . Advanced Structural Analysis by A. K. Jain, Nem Chand & Bros., Roorkee.Reference Readings:Ramamurtam: Limit State design, Nem Chand and Bros. . S. K. Mallik and A. P. Gupta, Reinforced Concrete Design, Oxford and IBH .	

5DCE03: Design of R.C.C. Structure-(Cr, L:T:P:-,::)		38hr
	Objective: :- Reinforced concrete is concrete in which the material's undesirably low tensile strength and elasticity are counteracted by the inclusion of reinforcing structures that have high tensile strength.	
UNIT-I	Introduction:. Reinforced Cement Concrete- its meaning, constituents, functions and specifications as per I.S... Working stress method of design. Limit state method of design. Ultimate method of design. Past practice and present practice for the design of structures.. Grades of concrete and steel. Stress - strain curve for concrete and steel. Load factors. Steel concrete bond, development length, anchorage value. Effective span, specification of reinforcement as per BIS	8hr
UNIT-II	Flexural Members:. Limit state of collapse. Limit state of flexure. Neutral axis, moment of resistance, balanced and unbalanced sections. Limit state of shear, nominal shear stress, shear strength of beam.. Design of shear reinforcement. Limit state of serviceability deflection and cracking criteria.. Curtailment of bars	8hr
UNIT-III	Analysis and Design of Beams :. Single reinforced beam. Doubly reinforced beam. T-beam. Lintel. Cantilever beam. Slabs :. Design criteria as per BIS. Design of one-way slab. Design of two-way slab with corners free to lift	6hr
UNIT-IV	Compression Members (axially loaded columns) :. Limit state of compression. Load carrying capacity. Design of short column (rectangular, square and circular cross section). Design of Footing :. Critical section for shear and bending moment. Design of an isolated footing of uniform depth for a square column. Layout of reinforcement	8hr
UNIT-V	Retaining Wall :. Types of retaining walls. Design of cantilever type retaining wall. Reinforcement details Prestressed Concrete :. Definition, advantages and methods of prestressing. Losses in prestressing. Stress calculations for point loads and uniformly distributed load for different tendon positions	8hr
	Text Books:. IS : – .. Reinforced Concrete – Limit State Design by A. K. Jain, Nem Chand & Bros., Roorkee. .Reinforced Concrete Design by P. DayaratnamReference books:- . Plain and Reinforced Concrete Vol. I & II by O. P. Jain & Jai Krishna, Nem Chand & Bros. . Reinforced Concrete Structures by R. Park and Pauley.	

5DCE04: Water supply & Sanitary Engg. (Cr, L:T:P:-,::)		38hr
	Objective: One of the basic necessities of life on this earth is water. Life would be impossible without it and yet it is unfortunately not available to many people in the required quantity and quality. The greater tragedy is the lack of awareness of people about water and sanitary requirements. One of the basic responsibilities of a diploma holder is to educate people in about public health standards followed by planning, design and construction of public health works. First, providing potable water and second, appropriate collection and disposal of waste solids and liquids. The purpose of this essential subject is to make the diploma holder to acquire the knowledge of all public health works and to enable him to construct them efficiently	
UNIT-I	. Water Demand and Quantity:. Water demand per capita for domestic and other uses. Population forecast. Fire demand. Design period. Demands as per B.I.S. Sources of Water. Quality of water obtained from different sources. Quality of Water:. Examination of water.. Physical.. Chemical.. Bacteriological. Portability of water. Impurities of water.. Suspended.. Colloidal.. Dissolved impurities. Permissible standard for potable water. Effects of impurities if they are more than permissible limits. Treatment of Water. Flow diagrams of treatment plants. Function, constructional details, working of.. Aeration unit. Feeding and mixing devices of chemicals.. Sedimentation.. Coagulation and flocculation unit. Filtration unit... Slow sand filter... Rapid sand filter... Pressure filter. Chlorination. Chemicals used in treatment. Desalination and defluoridation	8hr
UNIT-II	Regulatory Valves:. Sluice valve (gate valve). Reflux valve. Air release valve. Scour valve. Safety valves. Pressure relief valves. Fire hydrants. Distribution of Water :. Systems of supply.. Intermittent.. Continuous. Service reservoirs. Advantages and disadvantages of metered water supply. Types of layouts. Dead end system and its design as per PHED practice.. Grid system.. Radial system. Rural Water Supply:. Important aspects. Sources. Treatment. System of Sanitation:. Necessity of systematic collection and disposal of waste. Dry waste. Semi-liquid waste. Liquid waste. Terminology related to sanitary engineering	8hr
UNIT-III	Quantity of Sewage:. Domestic sewage. Industrial waste. Storm water. Volume of domestic sewage dry weather flow (D.W.F.) and equivalent DWF. Variation of flow. Limiting velocities.. Non-silting velocity.. Non-scouring velocity.. Self cleansing velocity.. Transporting velocity. Depth of flow. Characteristics and Composition of Sewage:. Decomposition of sewage. Sewage sampling. Physical and chemical analysis. Testing of sewage.. Physical test.. Biological test.. Chemical test Building Drainage:. Aims and requirements. Fittings and arrangements in single and multi storied buildings. Different sanitary fitting and their installation. Traps, seal in traps. Gulley trap. Intercepting trap. Grease trap. Causes of breaking seal in the traps and precautions. Testing of house drainage system. Septic tank. Soak pit	8hr
UNIT-IV	Sewerage Systems:. Types.. Separate system.. Combined system.. Partially separate system. Stone ware sewers. Cast iron sewers. Concrete sewers. Sewer Joints. Different shapes of sewers. Appurtenances:. Manholes.. Location.. Location.. Construction. Drop manhole. Inlets. Catch basin. Inverted syphon. Flushing tanks. Ventilating shaft. Lamp holes. Laying of Sewers :. Setting out alignment. Excavation. Checking the	6hr

	gradient using boning rod. Preparation of bed. Lowering, laying and jointing. Testing. Back filling. Construction of masonry sewers. Construction of surface drains Maintenance:. Inspection of mains. Cleaning of sewers. Precautions during cleaning operations. Maintenance of traps. Cleaning of house drainage line. Ventilation of sewers. Tools and equipment needed for maintenance	
UNIT-V	Sewage Disposal:. General composition of sewage. Strength of sewage. Land disposal. Dilution method of disposal. Nuisance due to disposal. Self purification of streams. Treatment and Disposal:. Primary treatment. Secondary treatment. Function and construction of.. Screening chambers.. Grit chambers.. Clarifier chambers.. Trickling filters.. Aeration tank.. Activated sludge process. Sludge treatment. Sludge digestion. Sludge disposal. Rural Sanitation:. Introduction. Dry and wet latrines: selection, location, design life. Latrine for waterlogged high flood areas.. Aqua privies. Storm water and sludge problem	8hr
	Text Books:-: . Water Supply Engg. S. K. Garg. Water Supply & Sanitary Engg. Rangwala. Water Supply Engineering B.C. Punmia. Sanitary Engineering S.K. Garg. Sanitary Engineering Rangwala. Sanitary Engineering B.C. Punmia. Water Supply & Sanitary Engg. G.S. Birde & J.S. Birde	
5DCE05: Civil Engg. Estimating & Costing (Cr, L:T:P:-)		
	Objective: :- Estimation and costing provides a qualification gained following formal education, specific training and experience that provides a general set of skills that are then applied to a diverse variety of problems.[1] Predominantly these relate to costs and contracts on construction projects	36hr
UNIT-I	Introduction:. Purpose. Importance of estimating. Common items of works in civil engineering construction works. Units of measurement for common items of works. Methods of measurement. Explanation of common terms used for estimating. Different types of estimates and their significance. Merits and demerits.. Methods of taking out quantities. Study of Basic Schedule of Rates (B.S.R.)	6hr
UNIT-II	. Rate-Analysis:. Factors affecting cost of work. Explanation of terms. Prime cost. Original cost. Provisional items. Provisional sum. Day work, item wise. Analysis of cost of material. Labour. Transport. Establishment charges and incidentals. Preparation of analysis of rates for items of work involved in building construction mentioned in practical syllabus.. Specifications:. Importance of specifications. Principles for writing out specifications, types of specification. Writing general and detailed specifications for items of work in building construction mentioned impractical syllabus.	6hr
UNIT-III	. Detailed Estimates for Buildings:. Calculation of quantities. Preparing abstract of cost for a residential building.. Earth Work Calculations for Road & Rail Formation:. Earthwork calculations and estimates for roads and rail formation For earth work following methods may be used:.. Mean depth method... Mean area method. Prismoidal formula method.. Graphical method Using longitudinal and typical cross sections. Cross section for different stations.. Finding earth work by these sections. Calculation of permanent and temporary lands for roads. Economical depth of digging	8hr

	for canals. Mass haul diagram. Preparing Detailed Estimates for the Various Items of Work from the given Drawing for. Detailed estimates for earthwork of irrigation canals. Septic tank and soak pit. Bitumen road	
UNIT-IV	Valuation of Property and Rent Fixation:. Objects of valuation. Free-hold property. Lease-hold property. Property income. Obsolescence. Market-value. Book value. Distress value. Monopoly value. Salvage value. Scrap value. Accommodation value. Replacement value. Sentimental value. Speculative value. Factors affecting the value of the property. Annuity. Capital cost. Capitalized value. Year's purchase. Methods of determining depreciation. Valuation of property. Method of determining valuation of property. Typical valuation report. Types of rents. Rules of capital cost fixation for govt. buildings. Rules for calculation of standard rent	8hr
UNIT-V	Procedure of Works:. Main staff structure of engineering department. Duties of junior engineer. Administrative approval. Expenditure sanction or approval. Technical sanction or a approval. Tender System. E-tendering. Technical bid and financial bid. Appropriation and re-appropriation of funds. Procedure for original minor and major works. Repair works. Types of estimates. Preliminary estimate. Cubical content estimate. Plinth area estimate. Revised estimate. Supplementary estimate. Daily labour on muster roll system. Completion report. Stores, Tools and Plants :. Purchase of stores. Reserve of stock. Dead stock. Surplus and unserviceable stores. Verification of stores. Issue of materials from stock. Tools and plants. M.A.S. account	8hr
	Text Books:B. N. Dutta, Estimating and Costing in Civil Engineering, UBS Publishers, rd Edition. B. Sengupta and H. Guha, Construction Management and Planning, TMGConstruction, Planning, Equipment and Methods by R. L. Peurify.Reference Books; . B. M. Dhira & P. S. Gahlot, Construction planning and management, New Age International Pvt. Ltd. M. Chakraborti, Estimating, Costing, Specification and valuation in Civil Engineering, Published by author, Calcutta	

5DCE06: Water Supply & sanitary Engg. Lab (Cr, L:T:P:-,::)		
	. To determine residual chlorine by Orthotolidine-Sodium test.. To determine optimum dose of coagulant by jar test.. To determine hardness of water by E.D.T.A. test.. To determine pH value of water by universal indicator method.. To determine total, dissolved and suspended solids in a water.. To determine turbidity of water by Jackson Turbid meter or nephelometer.. To determine the alkalinity by titration method.. Sampling procedure for water and sewage.. Determination of chlorides of sewage sample.. Determination of sulphates of sewage sample.. Determination of BOD of sewage sample.. Determination of COD of sewage sample	
	REFERE_CE BOOKS :. Water Supply Engg. S. K. Garg. Water Supply & Sanitary Engg. Rangwala. Water Supply Engineering B.C. Punmia. Sanitary Engineering S.K. Garg. Sanitary Engineering Rangwala. Sanitary Engineering B.C. Punmia. Water Supply & Sanitary Engg. G.S. Birde & J.S. Birde	
5DCE07: Civil Engineering Estimating & Costing Lab (Cr, L:T:P:-,::)		
	. Writing units for various items of work involved in construction. Recording measurement in M.B. Finding out the quantities of work for a residential building.. Calculation of arch masonry.. Preparation of detailed estimate for a residential building.. Single storey. Double storey. Writing detailed specifications and rate analysis schedules for. Earth work in excavation.. Concrete in foundation.. Brick work in sub and super structure.. Random rubble and Ashler masonry.. RCC in beams and slabs.. Plastering. Pointing. White washing, colour washing and distempering. Calculation of earthwork by average depth, average area, prismoidal formula and graphical method.. Find out earthwork for roads using longitudinal section and typical cross section.. Calculation of permanent and temporary land for roads.. Finding earth work for irrigation canals using L-section and cross section.. Calculation of permanent and temporary land for canals. Detailed estimate for septic tank and soak pit. Valuation by different methods.. Typical valuation reports. Calculation of rent of residential building. Calculation of rent of commercial building	
	REFERENCE BOOKS :. Estimating & Costing Chakerborty. Estimating & Costing B.N. Dutta. Estimating & Costing Rangwala. Estimating & Costing Bhasin. Estimating & Costing Vazirani & Chandola. Civil Engg. Estimating & Costing Mahajan. Civil Engg. Estimating & Costing G.S. Birdie. P.W.D. Basic Schedule of Rates of Rajasthan State.	
5DCE08	**Design of Concrete Structure LAB (Cr, L:T:P:-,::)**	
	Objective:- Designing of Slabs and Beams is done by using R.C.C advanced Techniques based on the International codes. Compressive Strength of Concrete.. Workability by Compaction Factor, Slump Test.. Determination of Constituents of Hardened Mortar.. Mix Design by IS Code Method. Design of sections for flexure	

	and shear. Design of one way Slab. Design of two way Slab. Design of circular water tank. Design of rectangular water tank	
5DCE09	**Advanced Foundation Lab (Cr, L:T:P:-,::)**	
	Objective:- To Establish the Foundation of a Structure before building it, advanced and better techniques are used in the subject. Design of isolated shallow footings, combined footings, raft foundations.. Design of pile foundations.. Design of wells and cassions.. Design of machine foundation.. Design of retaining structures etc.	
5DCE10: Practical Training & Industrial Visit (Cr, L:T:P:-,::)		

SEMESTER –VI		
6DCE01: Design of steel structure (Cr, L:T:P:-,::)		38hr
	Objective:-A diploma holder in Civil Engineering will be required to design and construct simple structures in his professional life. This subject covers design of simple steel structure. The student will also learn to use the latest relevant Indian Standard codes in the design practice of steel structures. NOTE : All designs are to confirm to the provisions of IS : -	
UNIT-I	Introduction:. Structural Steel. Structural Steel Sections. Steel as a structural material.. Advantages.. Disadvantages. Limit State Method.. Introduction.. Limit state design.. Limit state of strength.. Limit state of serviceability. Partial safety factor for material strength. Partial safety factor for loads.	8hr
UNIT-II	Bolted Connections:. Types of Bolts. Definition and detailing of Bolts. Types of bolted joints. Failure of bolted joints in. Design strength of bolt.. Bolts in shear.. Bolts in Tension.. Bolts in Bearing.. Tension capacity of plate.. Combined shear and tension. Efficiency of Bolted Joint	8hr
UNIT-III	Welded Connections:. Advantages and Disadvantage of welded joint. Permissible stresses in welds. Types of welded connections. Design of butt and fillet welded connections subjected to axial loads. Design of Tension Members:. Net sectional area. Design strength due to yielding of gross section. Design strength due to rupture at net section. Design strength due to block shear. Design of tension members (flats, angles and tee sections only.). Compression Members:. End conditions: Effective length, slenderness ratio, radius of gyration. Permissible stresses in compression as per IS : -. Strength of columns-single and built up sections.. Design of angle struts.. Design of axially loaded.. Single rolled steel section.. Built up section. Design of lacing. Design of battens	6hr
UNIT-IV	. Column Bases:. Design of slab base. Design of gusseted base. Design of Beams:. Plastic methods of design.. Plastic section modulus.. Shape factor.. Plastic hinge. Methods of Plastic Analysis. Plastic analysis of structures. Shear behavior of steel beam. Factors affecting plastic moment capacity.. Design of laterally restrained beams. Web buckling and crippling	8hr
UNIT-V	Roof Trusses:. Basic components of roof truss.. Types of loads on roof truss-.. Dead load.. Live load.. Wind load.. Design of purlins (only angle section for the given load). Plate Girder:. Components of plate girder.. Loads on plate girder.. Sketches of bolted and welded plate girder with various types of stiffeners.	8hr
	Text Books:-. Limit state Design of Steel Structure Dr.V.L. Shah & Prof. Veena Gore. Limit state Design of Steel Structure Subramanian. IS -. Steel Table	

6DCE02: Surveying II (Cr, L:T:P:-,::)		34hr
	Objective:- The important functions of Civil Engineering diploma holder include the jobs of (i) Surveying (ii) Plotting of survey data (iii) Preparation of topographic maps and (iv) Setting out works. Stress has, therefore, been given to the development of the skills in types of surveys including, Theodolite Survey, Tachometry survey that the Civil Engineering diploma holder will normally be called upon to perform. Ability of plotting and preparing survey maps and sections is equally important like fieldwork and so the students are required to be given practice in both	
UNIT-I	Theodolite:. Types. Different parts of a Venire Transit Theodolite. Fundamental axes. Temporary adjustment. Transiting. Swinging. Measurement of horizontal angle (Repetition and Reiteration method). Measurement of vertical angle. Measurement of the bearing. Prolonging a line. Use as level. Permanent adjustment	8hr
UNIT-II	Traverse:. Types - open and closed traverse. Methods of traversing.. Traversing by included angles.. Traversing by deflection angles. Latitudes and departures. Balancing of a traverse by.. Bowditch's rule.. Transit rule. Omitted measurement	8hr
UNIT-III	Tachometry:. Concept. Methods.. Stadia methods.. Tangential methods. Analytic lens. Determination of horizontal and vertical distances by.. Staff vertical.. Staff normal to the line of sight. Substance bar	6hr
UNIT-IV	Trigonometrically Leveling:. Determination of heights and distance of a point.. Base accessible.. Base inaccessible. Curves:. Elements of simple circular curves. Designation of curve. Radius and degree of curve. Relation between radius and degree of curve. Setting out of simple circular curve by linear and tangential methods. Vertical curves.. Types.. Setting out of vertical curves. Transition Curves.. Ideal transition curve.. Types of transition curve	6hr
UNIT-V	Mine Surveying:. Equipment of mine surveys. The stations and station markers. Measurement of distance and difference in elevation. Tunnel alignment and setting out. Modern Instruments - Brief Description:. Electronic distance measuring instruments. T--Theodolite. Total station. Global Positioning system	6hr
	Text Books:REFERE_CE BOOKS :. Surveying Vol. I & II B. C. Punmia. Surveying Vol. I & II T.P. Kanetkar. Surveying Devid Clark	

6DCE03:-Earthquake resistant Engineering (Cr, L:T:P:-,::)		34hr
	Objective::- The main objectives of earthquake engineering are: to Foresee the potential consequences of strong earthquakes on urban areas and civil infrastructure. And Design, construct and maintain structures to perform at earthquake exposure up to the expectations and in compliance with building codes	
UNIT-I	Engineering Seismology:. Introduction. Causes of Earthquakes. Seismology.. Seismic Waves.. Seismograph.. Seismogram. Earthquake size.. Magnitude.. Intensity.. Magnitude versus intensity.. Magnitude and intensity in seismic design. Classification of Earthquakes. Seismic zoning.. Use of zoning map.. Tectonic Features of India. Seismic zones of India	8hr
UNIT-II	Structural Dynamics:. Loads. Effect of Earthquake motion on structures. Fundamental natural period. Behavior of Buildings During Earthquakes :. Failure Mechanism of a Masonry Building.. Out of plane failure.. In plane failure.. Connection failure.. Diaphragm failure.. Failure due to opening in walls.. Pounding.. Non structural components failure. Earthquake damage categories. Types of damages observed in traditionally built constructions during past Earthquakes.. Stone masonry.. Wooden building.. Earthen building.. Non-engineering reinforced concrete buildings. Common causes of damage.	6hr
UNIT-III	Provisions for Seismic Strengthening of Masonry Constructions:. Introduction. Earthquake resistant construction. Traditionally built masonry constructions. Types of construction. Seismic design codes. Introduction of IS , . Special construction features (clause). Categories of Buildings. Codal Provisions of IS : . Seismic Strengthening Arrangements (Clause .).. Horizontal reinforcement.. Vertical reinforcement. Timber construction.. Types of timber construction. Introduction of IS : : .. Earthquake resistance features of stone masonry.. Earthquakes resistance features of burnt clay brick in weak mortar. Introduction to IS: General recommendation for improving Earthquakes resistance of earthen constructions.. Seismic strengthening features of earthen building	8hr
UNIT-IV	Seismic Performance of Reinforced Concrete Buildings:. Introduction. Flow of Inertia Forces.. Strong column-weak beam analogy. Effect of irregularities on performance of RC Buildings.. Definitions of irregular building. Identification of seismic damages in Reinforced concrete buildings. Ductile Detailing of Reinforced Concrete Buildings:. Introduction. Codal Provision of IS : (General Specification (Clauses .). Flexural members (clause .).. Longitudinal Reinforcement.. Transverse reinforcement. Columns and frame members subjected to axial load and bending (clause .).. Longitudinal reinforcement of columns.. Transverse reinforcement of columns. Special confining reinforcement. Beam column joint. Shear wall	6hr
UNIT-V	Disaster Management:. Introduction. Disaster management. Disaster rescue. Psychology of rescue. Rescue workers.. Qualities of the Rescuer. Rescue equipment. Safety in Rescue operations.. Basic precautions.. Rescue worker safety.. Casualty safety.. Equipment safety.. Hazards arise due to breakdown of public utilities	6hr
	Text Books:-. Earthquake Resistant Design of Structures by P. Agarwal & M. Shrikhande. Structural Dynamics – Theory & Computation by Mario Paz. Dynamics	

	of Structures Theory and Applications to Earthquake Engineering by Anil K. Chopra Reference Books:- . Introduction to Structural Dynamics by J.M. Biggs. Elements of Earthquake Engineering by Jai Krishna and A.R. Chandrasekharan. Fundamental of Earthquake Engineering by N.M. Neumarks and E. Rosenblueth	

6**DCE04. TRANSPORTATION ENGINEERING (Cr, L:T:P:-,::)**		
	Objective: For economic social and cultural development of a country, Highway plays a very important role. With the invention of heavy and high-speed automobiles, it has become necessary to construct path for them for their speedy, safe and underlay movement from one place to another place.	34hr
UNIT-I	Introduction :. Importance of highway transportation. Different modes of transportation. Scope of highway engineering. Highway Development and Planning :. Historical development of road construction. Necessity of highway planning. Classification of roads. Road pattern. Highway planning in India. Highway Geometric Design :. Highway alignment and basic consideration governing alignment for a road. Glossaries of terms used in road geometric and their importance. Highway cross section elements. Sight distances. Design of horizontal alignments. Design of vertical alignments. Traffic Engineering :. Scope of traffic engineering. Passenger car unit (PCU). Traffic control devices - signs, signals, marking, traffic islands. Causes and precaution of road accidents. On street and off street parking. Highway lighting	6hr
UNIT-II	Highway Materials:. Sub grade soil.. Desirable properties.. Highway research board classification of soils.. CBR test. Stone aggregates.. Desirable properties.. Attrition and abrasion tests.. Crushing test.. Impact test.. Shape test. Bituminous materials.. Penetration test.. Softening point test.. Ductility, flash and fire point.. Specific gravity test. Construction of Roads :. Introduction. Water Bound Macadam roads. Bituminous roads. Cement concrete road. Highway Maintenance:. Common types of road failures. Routine maintenance. Road Drainage and Road Arboriculture :. Necessity of road drainage. Surface and sub surface drainage. Object of road arboriculture. Common roadside trees. Plantation and protection of trees. Bridges:. Introduction: Classification of bridges.. Temporary bridges.. Permanent bridges. Selection of site of the bridges. Economical span of the bridges, calculation of discharge, velocity, afflux by various methods. Cause ways, culverts - brief description with sketches. Brief introduction to piers, abutments, wing walls and bearing.	6hr
UNIT-III	Railways :. Railways, its importance. Railway systems in India. Gauge, different gauges in India. Advantages and disadvantages of more than one gauge. Definition of a permanent way. Rails :. Function of rails. Requirement of rails. Types of rail sections - Double headed rails, bull headed, flat footed rail. Standard length and weight of flat-footed rails for different gauges. Wear of rails- its causes and effects. Failures of rails. Creep-its definition, causes, effect and prevention. Corrugated or roaring rails.. Conning of wheels. Sleepers :. Functions of sleepers. Characteristics of good sleeper. Different types of rail sleepers- wooden, steel, cast iron, concrete and prestressed concrete. Size and shapes of all type of sleepers. Sleeper density. Ballast :. Functions of ballast. Characteristics of good ballast. Materials used as ballast - broken stone, gravel, cinder, kanker, moorum, brickbats etc.. Size and section of ballast. Quantity of ballast. Renewal of ballast	8hr

UNIT-IV	Fixture and Fastenings :. Connection of rail to fish plate and welded rails. Connection of rail to sleepers. Details of fixtures used. Railway Geometries :. Alignment of railway line. Typical cross sectioning singles and doubles tracks in cutting and embankment. Gradients, curve, transition length as per railway code. Super elevation, cant deficiency. Widening of gauge on curves. Points and Crossing :. Necessity and details of arrangement. Sketch of a turnout. Functions of different parts and components. Different types of point and crossing. Turnout, crossover, scissors, diamond crossing with slips, double junctions, gathering lines. Turn tables and triangles	6hr
UNIT-V	Tracks Laying :. Plate laying. Methods of plate laying. Duties of a permanent way inspector. Maintenance :. Routine maintenance of formation and side slope. Routine maintenance of ballast, fixtures and drainage. Special maintenance - replacement of defective sleeper and rails. Tools used for the maintenance of track.. Stations and Yards :. Classification. Requirement and layout of station and yards. Flag station, wayside station, junction, terminal station. Passenger yards, goods yards. Marshalling yards, locomotive yards. Station equipments. Signaling:. Classification and functions of signal. Types of signal - Semaphore, Warner, shunt disc, color light signal, outer, home, routing signal, starter, advanced starter, calling on and co-acting signals. -aspect signals. Absolute block system. Automatic block system. Pilot guard system. Tunneling :. Introduction. Advantages and disadvantages. Methods of construction of tunnels full-face method and needle beam method. Factors effecting the alignment of tunnels. Description and sketches of different types of tunnels. Necessity of ventilation. Method of ventilation. Drainage of tunnels. Safety precautions to be taken at the time of construction of tunnels.	8hr
	REFERENCE BOOKS :. Highway Engg. Khanna & Justo.. Highway Engg. Priyani. Bridge Engg. S.P. Bindra. Railway Bridges and Tunnels Vazirani and Chandola. Railway Bridges and Tunnels B.L. Gupta. Railway Bridges and Tunnels G.C. Singh. Railway Engineering Saxena and Arora. Railway and Tunnels S.C. Rangwala. Highway Lab Manual A. K. Duggal, NITTTR Chandigarh	

6**DCE05 Irrigation Engineering (Cr, L:T:P:-,::)**		34hr
	Objective: In the field of irrigation engineering a diploma engineer is responsible for maintenance and smooth running of IRRIGATION channels. So he should have sufficient knowledge of water management for the growth of crops in the country. In the field of irrigation engineering, a diploma engineer is responsible for maintenance and smooth running of irrigation channels. So he should have sufficient knowledge of water management for the growth of crops in the country. Irrigation engineering is taught in the diploma course to impart the knowledge of :I. System of channels providing irrigation at agricultural areas. I. Crops and irrigation structures	
UNIT-I	Introduction:. History of irrigation development in India.. Classification and different methods of irrigation.. Water Requirements of Crops :. Classes and availability of soil water. Depth and frequency of irrigation. Relationship between duty, delta and base period.. Gross command area (G.C.A.) cultural commanded area (C.C.A.), cultural cultivated and uncultivated area. Intensity of irrigation. Factors affecting duty of water, methods of improving duty. Principal crops of Rajasthan and India. Sowing and harvesting time. Water requirements and rotation of different crops. Calculation of water requirement for a given irrigated area.	6hr
UNIT-II	Hydrology:. Hydrologic cycle. Rainfall its characteristics and methods of measurement.. Run off, factors affecting run off, determination of average annual run off.. Importance and different methods of gauging stream flow. Hydrograph, unit hydrograph and flood hydrograph. Dams :. Types of Dams. Selection of site for a dam. Forces acting on a gravity dam. Failure of gravity dams. Earthen and Rock fill Dams :. Homogeneous dams and composite dams. Causes of failure of earthen dams. Drainage of earthen dam. Rock-fill dams : basic features and its need	6hr
UNIT-III	Spillways :. Brief description and functions of different types of spillways River Training Works :. River behavior in plane and mountainous regions. Different methods of river training works sketches and brief description. Canals :. Explanation of terms-canal. Classification of canals, channel, major distributor, minor distributor, water course, navigation canal, hydro-canal, irrigation canal, perennial canal, inundation canal. Water shed. Drainage. Alignment of irrigation canal. Explanation of terms-critical velocity, rigidity coefficient, velocity ratio, silt factor. Regime, regime slope, regime dimensions. Relation between Kennedy's critical velocity ratio and Lacey's silt factor.. Problems of sediment transport in channels.. Salient features of Kennedy's and Lacey's silt theories. Computing the losses in irrigation channels. Water Logging:. Definition. Causes, effects and preventive measures. Types of canal lining brief description and advantages	8hr
UNIT-IV	Diversion Head Works :. Typical layout of head works. Brief description, sketches and function of component parts of weir or barrage. Scouring sluices, silt excluder. Divide-wall. Fish ladder. Guide bank. Marginal bunds. Head regulator. Classes of weirs.. Rock fill weir.. Bligh type weir.. Khosla type weir.. Pickup weir. Causes of failure of weirs.. Cross Drainage Works :. Brief description of different methods of disposal of drainage intercepted by canals. Inlet and outlet. Aqueduct and syphon aqueduct. Super passage and syphon. Level crossing	6hr
UNIT-V	Distributors Works :. Brief description and sketches of.. Distributor head.. Silt selective device.. Discharge regulator.. Tail escape.. Bed bar tail escape Well Irrigation :.	8hr

	Explanation of terms - well, open well tube well, shallow and deep well, ground water reservoir, multilayer, depression head, cone of depression, radius of influence critical velocity.. Classification of tube well.. Slotted wells.. Strainer wells.. Cavity wells. Brief description and sketches of common types of strainer. Construction of strainer well - selection of site boring and lowering of casing tube, preparation of strata chart, lowering strainers, shrouding, development. Construction of slotted and cavity wells. Duty of open wells and tube wells. Relative advantages and disadvantages of open wells and tube wells	

6DCE06: Surveying Lab-II(Cr, L:T:P:-,::)		
	. Study of parts of theodolite.. Measurement of horizontal angles by repetition and reiteration method.. Measurement of vertical angles.. Measurement of bearing of line. Prolonging of a line with theodolite.. Running a closed traverse using theodolite, computations, balancing and plotting by Gale's traverse table. Determination of stadia constants.. Contouring by Tachometry of a small area. Setting out of simple circular curves.. Determination of height of a distant point by trigonometrically leveling	
	REFERE_CE BOOKS:. Surveying Vol. I & II B. C. Punmia. Surveying Vol. I & II T.P. Kanetkar. Surveying David Clark	
6DCE07: Transportation Engg. Lab. (Cr, L:T:P:-,::)		
	. Determination of abrasion value of aggregates by Los Angel's test. Determination of impact value of aggregate. Determination of crushing value of given aggregates. Determination of C.B.R. value of sub grade soil.. Determination of penetration value of bitumen. Determination of softening point of bitumen.. Determination of ductility of bitumen. Determination of flash and fire point of bitumen	
	REFERENCE BOOKS :. Highway Engg. Khanna & Justo.. Highway Engg. Priyani. Bridge Engg. S.P. Bindra. Railway Bridges and Tunnels Vazirani and Chandola. Railway Bridges and Tunnels B.L. Gupta. Railway Bridges and Tunnels G.C. Singh. Railway Engineering Saxena and Arora. Railway and Tunnels S.C. Rangwala. Highway Lab Manual A. K. Duggal, NITTTR Chandigarh	
6DCE08	**Design of Steel Structure Lab LAB (Cr, L:T:P:-,::)**	
	Objective:- This lab is used for checking of deflection and bending in the Structure. Rolled sections and connections (welded and riveted).. Built-up columns and beams.. Gusset bases. Grillage footing. Roof trusses. Design of plate girder. Design of Deck type plate-girder. Design of sections for plate girder	
6DCE09: Final Project Report(Cr, L:T:P:-,::)		