Study & Evaluation Scheme

of

Diploma in Civil Engineering

[Applicable w. e. f. session 2011-12 till revised]

TEERTHANKER MAHAVEER UNIVERSITY

Delhi Road, Moradabad, Uttar Pradesh-244001

Website: www.tmu.ac.in

TEERTHANKER MAHAVEER UNIVERSITY

(Established under Govt. of U. P. Act No. 30, 2008)
Delhi Road, Moradabad (U.P)

Study & Evaluation Scheme
of
Diploma in Engineering (Civil)
SUMMARY

Programme : Diploma in Engineering

Duration : 3 Years (Semester system)

Medium : English

Minimum Required Attendance : 75 %

Assessment (Theory and Project) :

Internal	External	Total
30+10 (Project)	60	100

Maximum Credit : **187**

Minimum Credit required for the degree : **179**

Internal Evaluation (Theory Papers & Project) :

Class Test I	Class Test II	Class Test III	Assignment	Attendance	Project Report & Presentation	Grand Total
Best two out of the three						
10 Marks	10 Marks	10 Marks	5 Marks	5 Marks	10 Marks	40 Marks

Evaluation of Practical/ Dissertation & Project Report :

Internal	External	Total
50	50	100

Duration of Examination :

Internal	External
1 ½ hrs.	3 hr.

To qualify the course a student is required to secure a minimum of 45% marks in aggregate including the semester-end examination and teachers' continuous evaluation. (i.e. both internal and external).

A candidate who secures less than 45% of marks in a course shall be deemed to have failed in that course. The student should have at least 50% marks in aggregate to clear the semester. In case a student has more than 45% in each course, but less than 50% overall in a semester, he/she shall re-appear in courses where the marks are less than 50% to achieve the required aggregate percentage (of 50%) in the semester. It is compulsory for the student to appear in external examination to clear the course.

Question paper structure

1. *The question paper shall consist of eight questions. Out of which first question shall be of short answer type (not exceeding 50 words) and will be compulsory. Question No. 1 shall contain 8 parts representing all units of the syllabus and students shall have to answer any five (weightage 3 marks each).*
2. *Out of the remaining seven questions, student shall be required to attempt any five questions. There will be minimum one and maximum two questions from each unit of the syllabus. The weightage of Question No. 2 to 8 shall be 9 marks each.*

Study & Evaluation Scheme
Program: Diploma in Engineering (Civil)
Semester- I

S. No.	*Course Code*	*Subject*	*Periods*			*Credit*	*Evaluation Scheme*		
			L	*T*	*P*		*Internal*	*External*	*Total*
1	DIP101	Applied Mathematics – I	4	-	-	4	40	60	100
2	DIP102 OR DIP103	Applied Physics OR Applied Chemistry	6	-	-	6	40	60	100
3	DIP104 OR DIP105	Basics of Electrical & Civil Engineering OR Basics of Electronics & Mechanical Engineering	4	-	-	4	40	60	100
4	DIP106 OR DIP107	Concepts in Information Technology OR Applied Mechanics	4	-	-	4	40	60	100
5	DIP108	Foundation English – I	2	-	2	3	40	60	100
6	DIP151 OR DIP152	Physics Lab OR Chemistry Lab	-	-	3	2	50	50	100
7	DIP153 OR DIP154	Electrical Engineering Lab OR Electronics Engineering Lab	-	-	4	2	50	50	100
8	DIP155 OR DIP156	Information Technology Lab OR Applied Mechanics Lab	-	-	**4**	**2**	**50**	**50**	**100**
9	DIP157 OR DIP158	Workshop Practice OR Engineering Drawing	- 2	-	**8** 6	**4** 5	50	50	100
10	DGP101	Discipline & General Proficiency	-	-	-	1	100	-	100
Total			**20/ 22**	**-**	**21/** 19	**32/** 33	**500**	**500**	**1000**

Semester- II

S. No.	*Course Code*	*Subject*	*Periods*			*Credit*	*Evaluation Scheme*		
			L	*T*	*P*		*Internal*	*External*	*Total*
1	DIP201	Applied Mathematics – II	4	-	-	4	40	60	100
2	DIP202 OR DIP203	Applied Physics OR Applied Chemistry	6	-	-	6	40	60	100
3	DIP205 OR DIP204	Basics of Electronics & Mechanical Engineering OR Basics of Electrical & Civil Engineering	4	-	-	4	40	60	100
4	DIP207 OR DIP206	Applied Mechanics OR Concepts in Information Technology	4	-	-	4	40	60	100
5	DIP208	Foundation English – II	2	-	2	3	40	60	100
6	DIP251 OR DIP252	Physics Lab OR Chemistry Lab	-	-	3	2	50	50	100
7	DIP254 OR DIP253	Electronics Engineering Lab OR Electrical Engineering Lab	-	-	4	2	50	50	100
8	DIP256 OR DIP255	Applied Mechanics Lab OR Information Technology Lab	-	-	**4**	**2**	**50**	**50**	**100**
9	DIP258 OR DIP257	Engineering Drawing OR Workshop Practice	2	-	6 **8**	5 **4**	50	50	100
10	DGP201	Discipline & General Proficiency	-	-	-	-	100	-	100
Total			**22/ 20**	**2**	19/ **21**	**33/** 32	**500**	**500**	**1000**

Semester- III

S. No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	DCE301	Surveying – I	3	1	-	3	40	60	100
2	DME301	Strength of Materials	4	1	-	4	40	60	100
3	DCE302	Building Construction – I	3	1	-	3	40	60	100
4	DME302	Hydraulics & Hydraulic Machines	4	1	-	4	40	60	100
5	DCE303	Building Materials	3	-	-	3	40	60	100
6	DIP301	English Communication	2	-	2	3	40	60	100
7	DCE351	Surveying Lab – I	-	-	6	3	50	50	100
8	DME351	Strength of Materials Lab	-	-	3	2	50	50	100
9	DCE352	Building Construction Lab	-	-	3	2	50	50	100
10	DME352	Hydraulics & Hydraulic machines Lab	-	-	3	2	50	50	100
11	DCE355	Industrial Exposure	-	-	-	4	50	50	100
12	DGP301	Discipline & General Proficiency	-	-	-	1	100	-	100
Total			**19**	**4**	**17**	**34**	**590**	**610**	**1200**

Semester- IV

S. No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	DCE401	Soil Mechanics & Foundation Engineering	3	1	-	3	40	60	100
2	DCE402	Public Health Engineering – I	3	1	-	3	40	60	100
3	DCE403	Concrete Technology	3	1	-	3	40	60	100
4	DCE404	Irrigation Engineering	3	1	-	3	40	60	100
5	DCE405	Building Construction – II	3	1	-	3	40	60	100
6	DIP401	Technical Communication	2	-	2	3	40	60	100
7	DCE451	Soil Mechanics & Foundation Engineering Lab	-	-	3	2	50	50	100
8	DCE452	Public Health Engineering Lab	-	-	3	2	50	50	100
9	DCE453	Concrete Technology Lab	-	-	3	2	50	50	100
10	DCE454	Civil Engineering Drawing – I	2	-	6	5	50	50	100
12	DGP401	Discipline & General Proficiency	-	-	-	1	100	-	100
Total			**19**	**5**	**17**	**30**	**540**	**560**	**1100**

Semester- V

S. No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	DCE501	Transportation Engineering – I	3	-	-	3	40	60	100
2	DCE502	Surveying – II	3	-	-	3	40	60	100
3	DCE503	Construction Management and Accounts	3	1	-	3	40	60	100
4	DCE504	Environment Pollution & Control	3	-	-	3	40	60	100
5	DCE505	Public Health Engineering – II	3	-	-	3	40	60	100
6	DIP501	Communication Technique	2	-	2	3	40	60	100
7	DCE551	Transportation Engineering Lab	-	-	3	2	50	50	100
8	DCE552	Surveying Lab – II	-	-	6	3	50	50	100
9	DCE553	Civil Engineering Drawing – II	2	-	6	5	50	50	100
10	DCE555	Survey Camp (4 weeks)	-	-	-	4	50	50	100
11	DGP501	Discipline & General Proficiency	-	-	-	1	100	-	100
Total			**19**	**1**	**17**	**33**	**540**	**560**	**1100**

Semester- VI

S. No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	DCE601	Design of RCC Structures	3	1	-	4	40	60	100
2	DCE602	Design of Steel Structures	3	1	-	4	40	60	100
3	DCE603	Transportation Engineering – II	3	1	-	4	40	60	100
4	DCE604	Earth Quake Engineering	3		-	3	40	60	100
5	DCE605	Estimating, Costing and Valuation	2	3	-	4	40	60	100
6	DIP601	Corporate Communication	2	-	2	3	40	60	100
7	DCE651	RCC Lab	-	-	4	2	50	50	100
8	DCE652	Design Project on CAD	2	-	4	4	50	50	100
9	DGP601	Discipline & General Proficiency	-	-	-	1	100	-	100
Total			**18**	**6**	**10**	**29**	**440**	**460**	**900**

APPLIED MATHEMATICS – I

First Semester

	L	T	P	C
Course Code: DIP101	**4**	**-**	**-**	**4**

Course Contents:

Unit I

ALGEBRA-I

Series: A.P. and G.P.; n^{th} term, Sum to n terms, Arithmetic Mean.

Binomial theorem for positive, negative and fractional index (without proof). Application of Binomial theorem. **(10 Lectures)**

Unit II

Determinants: - Elementary properties of determinants of order 2 and 3, Multiplication system of algebraic equations, Consistency of equation, Crammer's rule.

Vector algebra:- Dot and Cross product of two vectors, Scalar and vector triple products. Work done, Moment of a force. **(10 Lectures)**

Unit III

TRIGONOMETRY:- Relations between sides and angles of a triangle: Statement of various formulae showing relationship between sides and angles of a triangle. Complex numbers, Representation, Modulus and amplitude De Moivre's theorem, its application in solving algebraic equations, Modulus Function and its properties. **(10 Lectures)**

Unit IV

CO-ORDINATE GEOMETRY: Standard form of curves and their simple properties –

Parabolas $y^2 = 4ax$, $y^2 = -4ax$, $x^2 = 4ay$, $x^2 = -4ay$.

Ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1,$

Hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1.$

Tangent and normal to these curves. **(10 Lectures)**

Unit V

Straight lines, planes and spheres in 3 – dimensional space –Distance between two points in space, direction cosines and direction ratios, projections finding equation of a straight line, and shortest distance between two lines.

Different forms of planes represented by equation $lx + my + nz = c$, relation between lines and planes, sphere $x^2 + y^2 + z^2 + 2gx + 2fy + 2wz \# d$. **(10 Lectures)**

Project work

A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 – 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge. The project will be evaluated by the external examiner.

Text Books:

1. Sharma, R D, *Applied Mathematics*.
2. Grewal B S*, Elementary Engineering Mathematics*, Khanna Publication.
3. Sumha Dr. K. S., *Applied Mathematics (I & II)*, Bharat Bharati Prakashan, Meerut.

Reference Books:

1. Gorakh Prasad, *Differential & Integral Calculus*
2. Mittal S C & Mittal, S K., *Two Dimensional Coordinate,* Pragati Prakashan, Meerut
3. Loney, S L, *Trigonometry (I part)*
4. Goel, B S, *Algebra*

APPLIED PHYSICS
First/Second Semester

L	T	P	C
6	-	-	6

Course Code: DIP102/202
Course Contents:
Unit I
Vector: - Scalar and vector quantities: Addition, Subtraction, Resolution of vector- Cartesian components of vector, Scalar and vector product of two vectors.
Force and Motion: Parabolic motion, projectiles thrown horizontally and at an angle. Problems on time of flight, horizontal range, and maximum horizontal range. Central forces. Circular motion, angular velocity, angular acceleration and centripetal acceleration. Relationship between linear and angular velocity and acceleration. Centripetal and centrifugal forces. Practical applications of centripetal forces. Principle of centrifuge. Gravitational force, Motion of satellites, Kepler's laws, Escape velocity, Geostationary satellite, Concept of Black holes, Jet propulsion theory, Motion of Multi-stage Rocket, SLV, PSLV and GSLV Rockets.

(10 Lectures)

Unit II
Dynamics of Rigid Body (Rotational Motion): Rigid body, Rotational motion, Moment of inertia, Theorems (Perpendicular and Parallel axis) of moment of inertia (Statement). Expression of M.I. of regular bodies, Radius of gyration, angular momentum, Conservation of angular momentum, Torque, Rotational kinetic energy. Rolling down the slant planes. Fluid Mechanics & Friction: Surface tension, Capillaries, Equation of continuity ($A_1V_1=A_2V_2$), Bernoulli's theorem, stream line and Turbulent flow, Reynolds's number.
Introduction and Physical significance of friction, Advantage and disadvantage of friction and its role in everyday life. Static and dynamic frictional forces. Coefficients of static and dynamic friction and their measurements. Viscosity, coefficient of viscosity, & its determination by Stock's method. **(10 Lectures)**

Unit III
Elasticity: - Elasticity, stress and strain. Hook's law, elastic limit. Yielding point and breaking point. Modulus of elasticity Young's modulus, bulk modulus and modulus of rigidity, Poisson ratio, Resilience.
Simple Harmonic Motion: Periodic Motion, characteristics of simple harmonic motion; equation of S.H.M. and determination of velocity and acceleration. Graphical representation. Spring-mass system. Simple pendulum. Derivation of their periodic time. Energy conservation in S.H.M. Definition of free, forced, undamped and damped vibrations, Resonance and its sharpness, factor.

(10 Lectures)

Unit IV
Application of Sound Waves:-
Acoustics:- Standing waves, Closed and Open organ pipes, Resonance, End correction. Definition of pitch, loudness, quality and intensity of sound waves. Echo and reverberation and reverberation time. Sabine's formula. Control of reverberation time (problems on reverberation time). Acoustics of building defects and remedy.
Optics: Quantum nature of light, Coherence (Spatial and temporal), Duality of wave and particle, Concept of Interference, Baptism, Fraunhofer single and N-slit diffraction, Grating, Resolving and dispersive power, Elementary concept of polarisation.

Magnetic Fields & Materials: Dia, Para and Ferro-magnetism, Ferrites, Hysteresis, Methods of plotting, Hysteresis curve of ferro magnetic materials and their uses, Magnetic circuits, Energy stored in magnetic fields. **(20 Lectures)**

Unit V

Semiconductor Physics: Energy bands in solids, classification of solids into conductors, insulators and semiconductors on the basis of energy band structure. Intrinsic and extrinsic semi conductors, P-type and N-type semiconductors, P-N junction formation, barrier voltage, Forward and reverse biasing of a junction diode, P-N junction device characteristics.

Nuclear physics: Radioactivity, Nuclear stability, Radioactive emission, radiation damage, Nuclear fission and fusion, Nuclear reactors (PHWR-type and fast breeder) and their application, Mass-energy relation, Automatic mass unit, Mass defect and binding energy. **(10 Lectures)**

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Text Books

1. Nayar P.V., *Engineering Physics*, Pearson Education Pvt. Ltd.
2. TTTI, *Applied Physics, Vol I & II*, Publications Tata Mc Graw Hill.
3. Verma HC, *Concepts in Physics Vol I & II*, Bharti Bhawan Ltd.

Reference Books

1. Subramanian & Brij Lal*, A text book of optics*, S. Chand & Co New Delhi.
2. Jaiswal J. N., *Comprehensive Practical Physics, Vol I & II*, Laxmi Publisher.

APPLIED CHEMISTRY
First/Second Semester

	L	T	P	C
Course Code: DIP103/203	**6**	**-**	**-**	**6**

Course Contents:

Unit I

ELECTRO CHEMISTRY: Arrhenius's Theory of electrolytic dissociation, Electrolytic conductance, Oswald dilution law. Concept of Acid and bases: Bronsted, Arrhenius's and Lewis theory. Concept of pH and it measurement by pH meter. Buffer solutions, Indicators, Solubility product, Common ion effect with their application, Redox reactions, Electrode potential (Nernst Equation), Electro-chemical cell (Galvanic and Electrolytic). Standard electrode potential, Electro chemical series and its application. **(10 Lectures)**

Unit II

ENVIRONMENTAL POLLUTION AND ITS CONTROL: Concept and various types of environmental pollution with special reference to air pollution and water pollution. General measures to control environmental pollution. depletion of Ozone layer, Green house effect, Acid rain, Smog formation, Chemical and photochemical reaction, Various species in atmosphere. Specific industrial pollution like Euro-I and Euro-II. **(10 Lectures)**

Unit III

WATER TREATMENT: Concept of hard and soft water, Hardness of water, Its limits and determination of hardness of water by EDTA method. Softening methods (Only Sods lime, Zeolite and Ion exchange resin process). Disadvantage of hard water in different industries, Boiler feed water boiler scale formation, Corrosion, Caustic embritilment, primming and foaming. Characteristics imparted by various impurities or contaminants such as colour, odour, taste and sediments and their analysis. **(10 Lectures)**

Unit IV

CORROSION: Concept of metallic corrosion, Types of corrosion and factors affecting the corrosion rate, Chemical and electrochemical theory of corrosion, Oxide film formation and its characteristics, tarnishing fogging and rusting, Prevention of corrosion by various methods.

FUELS: Definition of fuel, its classification and their composition, Calorific value.

Liquid fuel - Petroleum and its refining, distillate of petroleum (Kerosene oil, Diesel and Petrol), Benzol and Power alcohol.

Knocking, Anti-knocking agents, Octane number and Cetane number.

Cracking and its type, Gasoline from hydrogenation of coal (Bergius process and Fischer tropsch's process)

Gaseous Fuel - Coal gas, Oil gas, Water gas, Producer gas, Bio gas, LPG, CNG and Solar energy **(14 Lectures)**

Unit V

GLASS AND CERAMICS: Concept of glass and its constituents, Classification and uses of different glass, Elementary idea of manufacturing process of glass. Introduction to ceramics materials, it's constituent. Industrial application of glass and ceramic.

POLYMERS:

i) Introduction to basic terms used in polymer chemistry and technology. Monomers, Average degree of polymerisation, Average molecular weight.
ii) Characteristics of Polymers and their classification

- Addition polymers and their industrial application – Polystyrene, PVC, PAN, Buna-S, Teflon.
- Condensation, polymer and their industrial application: Nylon 6, Nylon 6, 6, Bakelite.

(16 Lectures)

Project work

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Text Books:

1. Mittal K.K., *Chemistry for Polytechnic,* Pragati Prakashan, Meerut.
2. Mehta V.P., *Polytechnic Chemistry,* Arun Publisher, Meerut.
3. Chandra S., *Text Book of Chemistry for Polytechnic,* Nav Bharat Prakashan, Meerut.
4. Chaudhari & Kataria, *Text Books of Chemistry for Polytechnic,* Bharat Bharati Prakashan, Meerut.

Reference Books:

1. Gaidher S.R. & Adasul B G, *Basic Chemistry for Polytechnic,* S.Chand Pub., Delhi.
2. Alla Appa Rao, *Polytechnic Chemistry,* New Age International Pub., Delhi.
3. Sharma S.D., *Polytechnic Chemistry,* Dhanpat Rai Pub., Delhi.

BASICS OF ELECTRICAL AND CIVIL ENGINEERING
First/Second Semester

	L	T	P	C
Course Code: DIP104/204	**4**	**-**	**-**	**4**

Course Contents:

Unit I

BASICS OF ELECTRICAL QUANTITIES :- Different forms of energy, Advantages of electrical energy, Uses of electrical energy, Basic concept of charge, Current, Voltage, Resistance Power, Energy and their units.

BATTERIES:-Basic idea about primary and secondary cells, Working principle, Construction and Application of lead acid, Nickel cadmium and Silver Oxide Cells. **(8 Lectures)**

Unit II

DC CIRCUIT:- Ohm's Law, Resistance in series and Parallel, Voltage and current division rule, Kirchhoff's Laws and their application in solving simple D. C. Network.

AC CIRCUIT:-Concept of alternating current and voltage, Equation of instantaneous values. Average rules, R.M.S. value, Form Factor and peak factor of sinusoidal waveform. Simple R-L-C Series circuit concept of three phase A.C. **(8 Lectures)**

Unit III

Magnetic Circuits:- Magnetic flux, flux density, field intensity, B-H Curve, difference between magnetic and electric circuit, Faraday's law, Fleming right hand, left hand rule, Lenz law, thumb rule, self and mutual, inductance, induced emf, energy stored in magnetic circuit. **(8 Lectures)**

Basics of Civil Engineering

Unit IV

- Classification of soil. Elementary ideas of Engineering properties of soil. Bearing capacity of soil.
- Geological consideration for site selection. Difference between Map & plan Engineering scales. **(8 Lectures)**

Unit V

- Foundation: Definition of foundation, classification, shallow and deep foundation and their common types, use of Machine foundation Black cotton soil foundation, walls their classification, load bearing, Non load bearing partition and cavity wall.

(8 Lectures)

Unit VI

- Most common type of masonry used in civil engineering works. Different types of mortars used in masonry work, brick masonry, Stone masonry, concrete block masonry, Bonds used in brick masonry, English & Flemish bonds, elevation, plan of one & one and half brick thick wall laying in English bond two course only. Cross section of wall of two story building. Showing different component. **(8 Lectures)**

Project work

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Text Books:

1. Narendra Kumar, *Basic Electrical Engineering*, Asian Publishers, Muzaffernagar.
2. Gupta D.V., *General Civil Engineering*, Asian Publishers, Muzaffernagar.

Reference Books:

1. Therja B.L., *Fundamental of Electrical Engineering*, S.Chand & Co., Delhi.
2. Punmia B.C., *Building Construction*, Laxmi Publication Pvt. Ltd., New Delhi.

BASICS OF ELECTRONICS AND MECHANICAL ENGINEERING
First/Second Semester

	L	T	P	C
Course Code: DIP105/205	**4**	**-**	**-**	**4**

Course Contents:

BASICS OF ELECTRONICS ENGINEERING

DETAILED CONTENTS:

Unit I

Electronic Component & Voltage and Current Sources:- Application of Electronics in different fields, Brief introduction to active and passive components, Resistor working, specification, testing & colour coding of resistor, Capacitor. Working, specification testing & colour coding, inductor working, RF coils, transformer. Concept of constant voltage & current sources, concept of practical voltage & current sources, conversion of voltage to current & current to voltage sources. **(8 Lectures)**

Unit II

Semiconductor Diode:- P-N junction diode, mechanism of current flow in P-N junction, drift and diffusion currents, depletion layer, potential barrier, breakdown, semiconductor diode characteristics, P-N junction diode as rectifier, half wave rectifier, full wave rectifier, bridge rectifier, different types of diode: power diode, zener diodes, varactor diodes, tunnel diode, LED's and photo diodes. **(8 Lectures)**

Unit III

Introduction to Bipolar Transistor Biasing and Stabilization of Operating Point:- Concept of bipolar transistor as a two junction and three terminal device having two kinds of charge carriers, PNP and NPN transistors, their symbols, concept of leakage current, effect of temperature on leakage of current, common base configurations (CB), common emitter configuration (CE), common collector configuration, different types of biasing ciruits for fixing the operation points, single stage CE amplifier circuit with proper biasing components. **(8 Lectures)**

Basics of Mechanical Engineering

Unit IV

Fluid Mechanics:- Introduction: Definition of fluid, Real fluid, fluid properties, fluid pressure and its measurement. Atmosphere, Absolute, Gauge and vacuum pressure. Buoyancy and floatation, Metacentre and Metacentric height, Suitability of submerged and floating bodies.

Fluid flow, types of fluid flow, velocity and acceleration of fluid elements. Path line, stream line, streak line, basic principles of fluid flow. Continuity equation Bernoulli's equation, flow measurement, Introduction of Hydraulic machines, turbines and pumps. **(8 Lectures)**

Unit V

Thermodynamic:- Basic concept and definitions. Macroscopic and microscopic approach. Thermodynamics systems, boundary, surrounding and universe, properties states, path process, cycle, quasistatic process, Reversible and Irreversible process. Thermodynamics laws-zeroth. First, Second, and third laws work and heat energy.

Heat engine and refrigeration, Carnot heat engine, I.C. engines. Types of I.C. engines.

(8 Lectures)

Unit VI

Simple Mechanism:- Introduction, Kinetic link. Types of link, Difference between machine and structure, kinetic pairs, types of constrained motions, kinetic chains, types of joints in a chain, number of degree of freedom for plane mechanisms. Types of kinetic chains, Grashof's law Cam and followers: classification of Cam and Follower. **(8 Lectures)**

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Text Books

1. Garg R.P., *Elements of Mechanical Engineering*, Standard Publishers Distributors, Delhi.
2. Sharma Sanjay, *Basic Electronics*, Publication of Engineering & Computer.

CONCEPTS IN INFORMATION TECHNOLOGY
First/Second Semester

	L	T	P	C
Course Code: DIP106/206	**4**	**-**	**-**	**4**

Course Contents:

Unit I

Concepts in computer & Programming; Computer Appreciation: Definition of electronic Computer, Generations, Characteristic and Application of Computers, Computer Hardware, CPU, RAM/ROM, Various I/O devices, Software Definition, Role and Categories. **(Lectures 08)**

Unit II

Computer Languages: Classification & Program Methodology, Generation of Language, Translators, Interpreters, Assemblers Compilers, Software Development life cycle: Waterfall model. Software Testing.

Number System: Various codes, decimal, binary, octal, hexadecimal conversion. **(Lectures 08)**

Unit III

Internet and Web Technologies; Internet & World Wide Web: Hypertext Marks Language, WWW, Gopher, FTP, Web Browsers, Search Engines, Email. **(Lectures 08)**

Unit IV

Concepts in Operating System System & Data Management: Elementary Concepts in Operating System, textual Vs GUI Interface, Introduction to DOS, MS Office Tools MS WORD, MS EXCEL, MS Power Point. **(Lectures 08)**

Unit V

Application of IT to Areas like E Commerce, Multimedia, and Entertainment.

Information Representation: Introduction to Information representation in Digital Media, Text, Image, graphics, Animation, Audio, Video etc, Introduction to JPEG & MPEG. **(Lectures 08)**

Project work

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Text Books

1. Yadav DS, *Foundations of IT*, New Age, Delhi.
2. Curtin, *Information Technology: Breaking News*, Tata Mo Grew Hill.
3. Rajaraman, *Introduction to Computers*, Prentice-Hall India

Reference Books

1. Nelson, *Data Compression*, BPB.
2. Peter Nortans, *Introduction to Computers*, TME.
3. Leon & Leon, *Fundamental of Information Technology,* Vikas Publishing.
4. Kantar, *Managing Information System.*
5. CIS Tams, *Internet, An Introduction*, Tata Mc Grew Hill.

Applied Mechanics
First/Second Semester

	L	T	P	C
Course Code: DIP107/207	**4**	**-**	**-**	**4**

Course Contents:

Unit I

Force Analysis: - System of forces, concept of coplanar and non-coplanar forces including parallel forces. Concurrent and non-concurrent forces, resultant forces, Equilibrium of forces, Law of parallelogram of forces, Law of triangle of forces and its converse, Law of polygon of forces, solution of simple engineering problems by analytical and graphical methods. Such as simple wall crane, jib crane etc. Determination of resultant of any number of forces in one plane acting upon a particle, Conditions of equilibrium of coplanar concurrent forces system.

(10 Lectures)

Unit II

Moment and couple, General conditions of Equilibrium Moment and couple Generalized theorem of moments, Application to simple problem on levers-Bell crank Lever, compound lever, steel yard, beams & wheels, lever safety valve, moment of couple, properties of a couple, simple applied problem such as pulley and shaft.

General conditions of Equilibrium : Rigid body under the action of coplanar forces, statement of forces, Laws of equilibrium: moment law of equilibrium, application of above on body.

(10 Lectures)

Unit III

Friction: Types of friction: Stoical Limiting and dynamical friction statement of Laws of sliding friction, coefficient of friction, angle of friction: Problems on equilibrium of a body resting on a rough inclined plane, simple problems on friction, conditions of sliding and toppling.

(10 Lectures)

Unit IV

Stress and strain: Concept of stress and strain. Various types of stress and Strains, Definition of tension, compression, shear, bending, torsion, concept of volumetric and lateral strain, Poisson's ratio, changes in dimensions and volume of a bar under direct load (Axial and along all the three Axes), ultimate stress, Working stress, elasticity, Hook's Law, Load deformation diagram for mild steel and cast iron. Definition of modulus of elasticity, Yield point, modulus of rigidity and bulk modulus, stress & strain for homogeneous material and composite section. **(10 Lectures)**

Unit V

Beam and trusses; Definition of statically determinate and indeterminate trusses. Types of supports tie and struts, Bow's notation space diagram, polar diagram, funicular polygon, calculation of reaction at the support of cantilever and simply supported beams and trusses graphically and Analytically, Graphical solution of simple determinate trusses with reference to forces diagram for determining the magnitude and nature of forces in its various members Analytical method; Methods of joints and method of sections (Simple problems only).

(10 Lectures)

Project work

A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 – 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

Text Books

1. Bansal R.K., *Engineering Mechanics*, Laxmi Publication Pvt Ltd., Delhi.
2. Khurmi R.S., *Engineering Mechanics*, S. Chand & Co., Delhi.
3. Kapoor J.K., *Applied Mechanics*, Bharat Bharti Prakashan, Meerut.
4. Yadav K.S., *Engineering Mechanics*, Vayu Education of India.

Ref Books:

1. Kumar D.S., *Engineering Mechanics*, S.K. Kataria & Sons, Delhi.

Foundation English I
First Semester

Course Code: DIP108

L	T	P	C
2	0	2	3

Course Content:

Unit I

Functional Grammar: Parts of speech – Noun, Pronoun, Adverb, Verb, Adjective, Preposition, Conjunction, Interjection.

Articles- Use of a, an, the, Subject, Predicate. **(8 Hours)**

Practical (Oral): Making the student use correct grammatical rules in sentences. **(2 Hours)**

Unit II

Vocabulary: Word formation, prefix, suffix, synonyms, antonyms, homophones. **(8 Hours)**

Practical (Oral): Make the students read newspaper cuttings and note down words (meanings of which are not known to them). Making efforts to increase their vocabulary. **(2 Hours)**

Unit III

Structure of sentences: Definition of sentence? Kinds of sentences: Simple, Compound, Complex. How sentences are formed? Sentence pattern: Assertive, Affirmative, Negative etc. **(8 Hours)**

Practical (Oral): To make students use different sentences while speaking on any topic. **(2 Hours)**

Unit IV

Comprehension Skills: Role of listening, Reading a passage for comprehension, How to answer questions given from the passage read, How to improve comprehension skills? **(8 Hours)**

Practical (Oral): Making the students practice comprehension in the practical classes. **(2 Hours)**

Recommended Books:

1. Wren & Martin: High School English Grammar & Composition – S. Chand & Co., New Delhi.
2. Lewis Norman : Word Power Made Easy- W.R. Goyal Publisher & Distributors, New Delhi.
3. Better Your English- A Workbook for 1st year Students- Macmillan India, New Delhi.

NOTE:

This syllabus has been designed to improve the oral and written communication skills of students. The faculty members should put emphasis on practical (oral) activities for generating students' interest in language learning.

*** Latest editions of all the suggested books are recommended.**

PHYSICS LAB

	L	T	P	C
Course Code: DIP151/251	**-**	**-**	**3**	**2**

List of Experiments

1. To find the diameter of wire using a screw gauge.
2. To find volume of solid cylinder and hollow cylinder using a vernier caliper.
3. To determine the thickness of glass strip and radius of curvature of a concave surface using a spherometer.
4. To verify the parallelogram law of forces.
5. To determine the atmospheric pressure at a place using Fortin's Barometer.
6. To determine the surface tension of a liquid by capillary rise method.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

<table>
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(5 MARKS)</td></tr>
</table>

External Evaluation (50 marks)

The evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

CHEMISTRY LAB

	L	T	P	C
Course Code: DIP152/252	**-**	**-**	**3**	**2**

LIST OF PRACTICAL

1. To determine the Chloride content in supplied water sample by using Mohr's methods.
2. Determination of temporary hardness of water sample by O-Hener's method.
3. To determine the total hardness of water sample in terms of CaCO3 by EDTA titration method using EBT indicator.
4. To determine the percentage of available Chlorine in the supplied sample of Bleaching powder.
5. Identification of Nitrogen, Sulphur and Halogens in an organic compound.

Evaluation of Practical Examination:
Internal Evaluation (50 marks)
Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

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External Evaluation (50 marks)
The evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

ELECTRICAL ENGINEERING LAB

	L	T	P	C
Course Code: DIP153/253	**-**	**-**	**4**	**2**

PRACTICAL:

1) To verify the Ohm's Law.
2) To verify that $R_e = R_1+R_2+\ldots\ldots$ where R_1, R_2 etc. are resistance connected in series.
3) Verification of Kirchhoff's current and Voltage Law's applied to D.C. circuit.
4) To observe the A.C. and D.C. waveshape on C.R.O.
5) To study different types of practical transformer.
6) To verify that $1/R_e=1/R_1 + 1/R_2+\ldots..1/R_m$. Where R_1, $R_2\ldots..R_m$ are all resistances connected in parallel.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

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External Evaluation (50 marks)

The evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

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ELECTRONICS ENGINEERING LAB

	L	T	P	C
Course Code: DIP154/254	**-**	**-**	**4**	**2**

Practical No.- 1
Object :- To study, Identification & testing of passive Components, Resistor Compactor.
Practical No.- 2
Object:- Draw the V-I characteristics of P-N Junction Diode in forward and reverse Bias.

i) Silicon
ii) Germanium

Practical No.- 3
Object :- Draw the input and output wave form of Half wave rectifier using semi conductor diode.
Practical No.- 4
Object :- Draw the input and output wave form of full wave rectifier using semi conductor diode.
Practical No.- 5
Object :- Draw input and output characteristics of Transistor in common base configuration.
Practical No.- 6
Object :- Draw the V-I characteristics of zener diode.

Evaluation of Practical Examination:
Internal Evaluation (50 marks)
Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

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External Evaluation (50 marks)
The evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

INFORMATION TECHNOLOGY LAB

	L	T	P	C
Course Code: DIP155/255	**-**	**-**	**4**	**2**

1. Create a document using functions: Save as, page number, Bullets and numbering.
2. Create a document using styles and Formatting options.
3. Create a document using different fonts.
4. Create a document, using the function page set up, & page preview, then print that document.
5. Create a table & perform operation in it.
6. Create a table, chart in excel and implement all formula as addition, subtraction, multiplication and division.
7. How to use Mail Merge in MS Word.
8. Create a Power point presentation using slide designing.
9. Create, Save & print the power point presentation.
10. Create a power point presentation using clipart, Word art gallery & then add transition & Animation effects.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

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External Evaluation (50 marks)

The evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

APPLIED MECHANICS LAB

Course Code: DIP156/256

L	T	P	C
0	0	4	2

LIST OF EXPERIMENTS

1. To verify the law of Polygon of forces.
2. To verify the law of parallelogram and triangle of forces.
3. To verify the law of principle of moments.
4. To find the coefficient of friction between wood, steel, copper and glass.
5. To find the reaction at supports of a simply supported beam carrying point loads only.
6. To find the forces in the jib & tie of a jib crane.
7. To find the forces in the members of a loaded roof truss. (King / Queen post truss)

Evaluation of Practical Examination:
Internal Evaluation (50 marks)
Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

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External Evaluation (50 marks)
The evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

WORKSHOP PRACTICE

First/Second Semester

	L	T	P	C
Course Code: DIP157/257	**-**	**-**	**8**	**4**

1. Carpentry Shop Work:

Ex-1 Planning and sawing practice.
Ex-2 Making of Lap Joint.
Ex-3 Making of Mortise and tendon Joint
Ex-4 Making of Briddle Joint.
Ex-5 Making of Dovetail Joint.
Ex-6 Making of any one utility articles such as wooden-picture frame, hanger, peg, name plates etc.

2. Painting and Polishing:

Ex-1 To prepare a wooden surface for painting apply primer on one side and to paint the same side. To prepare French polish for wooden surface and polish the other side.
Ex-2 To prepare metal surface for painting, apply primer and paint the same.
Ex-3 To prepare a metal surface for spray painting, Ist spray primer and paint the same by spray painting gun and compressor system.
Ex-4 Buffing and abrasive polishing of brass job.
Ex-5 Zinc coating by electroplating method.
Ex-6 To prepare any utility job.
The sequence of polishing will be as bellow:
i) Abrasive cutting by leather wheel.
ii) Polishing with hard cotton wheel and with polishing material.
iii) Buffing with cotton wheel or buff wheel.

3. Sheet Metal Working and Soldering:

Ex-1 Cutting, shearing and bending of sheet.
Ex-2 To prepare a soap case with the metal sheet.
Ex-3 To make a funnel with thin sheet and to solder the seam of the same.
Ex-4 To make a cylinder and to solder the same.
Ex-4 Preparation of different type of joints such as Lap joint-single seam, double seam. Hemp and wired joints.
Ex-5 Study and sketch the various types of stakes.

4. Fitting Shop:

Ex-1 Hacks awing and chipping of M.S. flat.
Ex-2 Filing and squaring of chipped M.S. job.
Ex-3 Filing on square or rectangular M.S. piece.
Ex-4 Making Bolt & Nut by Tap and Die set.
Ex-5 To drill a hole in M.S. Plate and taping the same to create threads as per need.
Ex-6 Utility article-to prepare a screw driver or paper weight, double open mouth spanner for 18" hexagonal head of a bolt.

5 A. Plumbing Work :

Ex-1 Cutting and Threading practice for using socket, elbow and Tee etc. and fit it on wooden practice board.

Ex-2 Study of-Bib cock, cistern or stop cock, wheel valve and gate valve etc.

5 B. Foundry Shop Work :

Ex-1 Study & sketch of the foundry.

Ex-2 Study & sketch of Copula & Pit Furnace.

Ex-3 To Prepare the green moulding sand and to prepare moulds (single piece and double piece pattern sweep mould).

Ex-4 Casting of non ferrous (lead or aluminum) as per exercise 3.

6. Smithy Shop work :

Ex-1 To prepare square or rectangular piece by the M.S. rod.

Ex-2 To braze M.S. Flats/Tipped tools on M.S. shank.

Ex-3 To make a screw driver with metallic handle.

Ex-4 To make a square or hexagonal head bolt.

Ex-5 To make a ring with hook for wooden doors.

Ex-6 Utility Articles - to prepare a ceiling fan hook.

7. Welding Shop:

Ex-1 Welding practice-Gas and Electric.

Ex-2 Welding for lap joint after preparing the edge.

Ex-3 Welding of Butt joint after preparation of the edge.

Ex-4 'T' joint welding after preparation of edge.

Ex-5 Spot welding, by spot welding Machine.

Ex-6 Welding of Plastic by Hot strip method.

8. Machine Shop :

Ex-1 Study & sketch of Lathe machine.

Ex-2 Plane and step turning & knurling practice.

Ex-3 Study & sketch of planning machine and plane a rectangle of cast iron.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

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</table>

External Evaluation (50 marks)

The evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

ENGINEERING DRAWING

First/Second Semester

	L	T	P	C
Course Code: DIP158/258	**2**	**-**	**6**	**5**

1. Drawing, instruments and their uses.

1.1. Introduction to various drawing, instruments.
1.2. Correct use and care of Instruments.
1.3. Sizes of drawing sheets and their layouts.

2. (a) Lettering Techniques **1 Sheet**

Printing of vertical and inclined normal single stroke capital letters and numbers.

(b) Conventional Representation:

Types of lines, Conventional representation of materials.

3. Introduction to Scales **1 Sheet**

Necessity and use, R F

Types of scales used in general in engineering drawing, plane, diagonal and chord scales.

4. (a) Principles of Projection

Orthographic, Pictorial and perspective.
Concept of horizontal and vertical planes.
Differences between I and III angle projections.
Dimensioning techniques.

(b) Projections of points, lines and planes. **1 Sheet**

5.Orthographic Projections of Simple **2 Sheet**
Geometrical Solids

Edge and axis making given angles with the reference planes. Face making given angles with reference planes. Face and its edge making given angles with reference planes.

6. Section of Solids **1 Sheet**

Concept of sectioning

Cases involving cutting plane parallel to one of the reference planes and perpendicular to the others.

Cases involving cutting plane perpendicular to one of the reference planes and inclined to the other plane, true shape of the section.

7. Development of Surfaces **1 Sheet**

Parallel line and redial line methods of development.

Development of simple and truncated surfaces (Cube, prism, cylinder, cone and pyramid).

8. Isometric Projection. **1 Sheet**

Isometric scale

Isometric Projection of solids.

9. ORTHOGRAPHIC PROJECTION : **1 Sheet**

Nut and Bolt, Rivets and Riveted Joints.

10. PRACTICE ON AUTO CAD:

To draw geometrical figures using line, circle, arc, polygon, ellipse, rectangle – erase and other editing commands and snap commands (two dimensional drawing only).

Text Books:

1. Bhatt N.D., *Engineering Drawing*, Charotar Publishing House Pvt. Ltd., Anand.
2. Upadhayay S.D., *Engineering Drawing*, Bharat Bharti Prakashan, Merrut.
3. Goyal B.K., *Engineering Drawing*, Asian Publishers, Muzaffarnagar.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

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External Evaluation (50 marks)

The evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

Semester I
DISCIPLINE & GENERAL PROFICIENCY

Course Code: DGP101/201/301/401/501/601

L	T	P	C
0	0	0	1

Guidelines

There shall be continuous evaluation of the students on the following broad parameters:

1. Observance of dress code.
2. Participation in Conferences /Workshops / Seminars.
3. Attendance in guest lectures, talks by the invitees and special technical sessions organized from time to time.
4. Participation in community projects including NCC and NSS.
5. Exhibiting team spirit in different activities of the University and College organized from time to time.
6. Observance of rule &regulations in the College/University.
7. Behavior in hostel mess and hostel.
8. Performance and awards received in different events (sports/ co-curricular activities) organized at College / University and other level.
9. General behavior.

The above mentioned observational are an indicative list of parameters on which the students shall be continuously evaluated. The college may evaluate the student on the specific parameters by informing them through a notice displayed on the notice board before evaluation.

There shall be no external examination for this course; however the marks shall be included for calculation of Cumulative Performance Index (CPI).

APPLIED MATHEMATICS – II

Second Semester

	L	T	P	C
Course Code: DIP201	**4**	**-**	**-**	**4**

Course Contents:

Unit I

DIFFERENTIAL CALCULUS:

Functions, limits, continuity - functions and their graphs, range and domain, elementary methods of finding limits (right and left), elementary test for continuity and differentiability.

Methods of finding derivative, - Function of a function, Logarithmic differentiation, Differentiation of implicit functions, Higher order derivatives, Leibniz theorem.

(10 Lectures)

Unit II

Special functions (Exponential, Logarithmic, Hyperbolic, Inverse circular), Definition, Graphs, range and Domain and Derivations of each of these functions.

Application - Finding Tangents, Normal, Points of Maxima/Minima. **(10 Lectures)**

Unit III

Increasing/Decreasing functions, sketching of some simple curves (without assumptions, question, not to be asked in the examination), Rate, Measure, velocity, Acceleration, Errors and approximation. **(10 Lectures)**

Unit IV

Integral Calculus:

Methods of Indefinite Integration: Integration by substitution, Partial fraction and by parts, Meaning and properties of definite integrals, Evaluation of definite integrals. **(10 Lectures)**

Unit V

Application: Finding areas bounded by simple curves, Length of simple curves, Volume of solids of revolution. Simpson's and Trapezoidal Rule: their application in simple cases.

(10 Lectures)

Project work

A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 – 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

Ref Books:

1. Gorakh Prasad, *Differential & Integral Calculus*
2. Mittal S C & Mittal, S K., *Two Dimensional Coordinate,* Pragati Prakashan, Meerut
3. Loney, S L, *Trigonometry (I part)*
4. Goel, B S, *Algebra*

Text Books:

1. Sharma, R D, *Applied Mathematics*.
2. Grewal B S*, Elementary Engineering Mathematics*, Khanna Publication.
3. Sumha Dr. K. S., *Applied Mathematics (I & II)*, Bharat Bharati Prakashan, Meerut

APPLIED PHYSICS

Second/First Semester

	L	T	P	C
Course Code: DIP201/102	**6**	**-**	**-**	**6**

Course Contents:

Unit I

Vector:- Scalar and vector quantities: Addition, Subtraction, Resolution of vector- Cartesian components of vector, Scalar and vector product of two vectors.

Force and Motion: Parabolic motion, projectiles thrown horizontally and at an angle. Problems on time of flight, horizontal range, and maximum horizontal range. Central forces. Circular motion, angular velocity, angular acceleration and centripetal acceleration. Relationship between linear and angular velocity and acceleration. Centripetal and centrifugal forces. Practical applications of centripetal forces. Principle of centrifuge. Gravitational force, Motion of satellites, Kepler's laws, Escape velocity, Geostationary satellite, Concept of Black holes, Jet propulsion theory, Motion of Multi-stage Rocket, SLV, PSLV and GSLV Rockets.

(10 Lectures)

Unit II

Dynamics of Rigid Body (Rotational Motion): Rigid body, Rotational motion, Moment of inertia, Theorems (Perpendicular and Parallel axis) of moment of inertia (Statement). Expression of M.I. of regular bodies, Radius of gyration, angular momentum, Conservation of angular momentum, Torque, Rotational kinetic energy. Rolling down the slant planes. Fluid Mechanics & Friction: Surface tension, Capillaries, Equation of continuity ($A_1V_1=A_2V_2$), Bernoulli's theorem, stream line and Turbulent flow, Reynolds's number.

Introduction, Physical significance of friction, Advantage and disadvantage of friction and its role in everyday life. Static and dynamic frictional forces. Coefficients of static and dynamic friction and their measurements. Viscosity, coefficient of viscosity, & its determination by Stock's method. **(10 Lectures)**

Unit III

Elasticity:- Elasticity, stress and strain. Hook's law, elastic limit. Yielding point and breaking point. Modulus of elasticity Young's modulus, bulk modulus and modulus of rigidity, Poisson ratio, Resilience.

Simple Harmonic Motion: Periodic Motion, characteristics of simple harmonic motion; equation of S.H.M. and determination of velocity and acceleration. Graphical representation. Spring-mass system. Simple pendulum. Derivation of their periodic time. Energy conservation in S.H.M. Definition of free, forced, undamped and damped vibrations, Resonance and its sharpness, factor.

(10 Lectures)

Unit IV

Application of Sound Waves:-

Acoustics: - Standing waves, Closed and Open organ pipes, Resonance, End correction. Definition of pitch, loudness, quality and intensity of sound waves. Echo and reverberation and reverberation time. Sabine's formula. Control of reverberation time (problems on reverberation time). Acoustics of building defects and remedy.

Optics: Quantum nature of light, Coherence (Spatial and temporal), Duality of wave and particle, Concept of Interference, Baptism, Fraunhofer single and N-slit diffraction, Grating, Resolving and dispersive power, Elementary concept of polarisation.

Magnetic Fields & Materials: Dia, Para and Ferro-magnetism, Ferrites, Hysteresis, Methods of plotting, Hysteresis curve of ferro magnetic materials and their uses, Magnetic circuits, Energy stored in magnetic fields. **(20 Lectures)**

Unit V

Semiconductor Physics: Energy bands in solids, classification of solids into conductors, insulators and semiconductors on the basis of energy band structure. Intrinsic and extrinsic semi conductors, P-type and N-type semiconductors, P-N junction formation, barrier voltage, Forward and reverse biasing of a junction diode, P-N junction device characteristics.

Nuclear physics: Radioactivity, Nuclear stability, Radioactive emission, radiation damage, Nuclear fission and fusion, Nuclear reactors (PHWR-type and fast breeder) and their application, Mass-energy relation, Automatic mass unit, Mass defect and binding energy.

(10 Lectures)

Project work

A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 – 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

Text Books

1. Nayar P.V., *Engineering Physics*, Pearson Education Pvt. Ltd.
2. TTTI, *Applied Physics, Vol I & II*, Publications Tata Mc Graw Hill.
3. Verma HC, *Concepts in Physics Vol I & II*, Bharti Bhawan Ltd.

Ref Books:

1. Subramanian & Brij Lal*, A text book of optics*, S. Chand & Co New Delhi.
2. Jaiswal J. N., *Comprehensive Practical Physics, Vol I & II*, Laxmi Publisher.

APPLIED CHEMISTRY

Second/First Semester

	L	T	P	C
Course Code: DIP203/103	**6**	**-**	**-**	**6**

Course Contents:

Unit I

ELECTRO CHEMISTRY: Arrhenius's Theory of electrolytic dissociation, Electrolytic conductance, Oswald dilution law. Concept of Acid and bases: Bronsted, Arrhenius's and Lewis theory. Concept of pH and it measurement by pH meter. Buffer solutions, Indicators, Solubility product, Common ion effect with their application, Redox reactions, Electrode potential (Nernst Equation), Electro-chemical cell (Galvanic and Electrolytic). Standard electrode potential, Electro chemical series and its application. **(10 Lectures)**

Unit II

ENVIRONMENTAL POLLUTION AND ITS CONTROL: Concept and various types of environmental pollution with special reference to air pollution and water pollution. General measures to control environmental pollution. depletion of Ozone layer, Green house effect, Acid rain, Smog formation, Chemical and photochemical reaction, Various species in atmosphere. Specific industrial pollution like Euro-I and Euro-II. **(10 Lectures)**

Unit III

WATER TREATMENT: Concept of hard and soft water, Hardness of water, Its limits and determination of hardness of water by EDTA method. Softening methods (Only Sods lime, Zeolite and Ion exchange resin process). Disadvantage of hard water in different industries, Boiler feed water boiler scale formation, Corrosion, Caustic embritilment, primming and foaming. Characteristics imparted by various impurities or contaminants such as colour, odour, taste and sediments and their analysis. **(10 Lectures)**

Unit:- IV

CORROSION: Concept of metallic corrosion, Types of corrosion and factors affecting the corrosion rate, Chemical and electrochemical theory of corrosion, Oxide film formation and its characteristics, tarnishing fogging and rusting, Prevention of corrosion by various methods.

FUELS: Definition of fuel, its classification and their composition, Calorific value.

Liquid fuel - Petroleum and its refining, distillate of petroleum (Kerosene oil, Diesel and Petrol), Benzol and Power alcohol.

Knocking, Anti-knocking agents, Octane number and Cetane number.

Cracking and its type, Gasoline from hydrogenation of coal (Bergius process and Fischer tropsch's process)

Gaseous Fuel - Coal gas, Oil gas, Water gas, Producer gas, Bio gas, LPG, CNG and Solar energy **(14 Lectures)**

Unit:- V

GLASS AND CERAMICS: Concept of glass and its constituents, Classification and uses of different glass, Elementary idea of manufacturing process of glass. Introduction to ceramics materials, it's constituent. Industrial application of glass and ceramic.

POLYMERS:

i. Introduction to basic terms used in polymer chemistry and technology. Monomers, Average degree of polymerisation, Average molecular weight.

ii. Characteristics of Polymers and their classification

- Addition polymers and their industrial application – Polystyrene, PVC, PAN, Buna-S, Teflon.
- Condensation polymer and their industrial application: Nylon 6, Nylon 6, 6, Bakelite.

(16 Lectures)

Project work

A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 – 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

Text Books:

1. Mittal K.K., *Chemistry for Polytechnic,* Pragati Prakashan, Meerut.
2. Mehta V.P., *Polytechnic Chemistry,* Arun Publisher, Meerut.
3. Chandra S., *Text Book of Chemistry for Polytechnic,* Nav Bharat Prakashan, Meerut.
4. Chaudhari & Kataria, *Text Books of Chemistry for Polytechnic,* Bharat Bharati Prakashan, Meerut.

Reference Books:

1. Gaidher S.R. & Adasul B G, *Basic Chemistry for Polytechnic,* S.Chand Pub., Delhi.
2. Alla Appa Rao, *Polytechnic Chemistry,* New Age International Pub., Delhi.
3. Sharma S.D., *Polytechnic Chemistry,* Dhanpat Rai Pub., Delhi.

BASICS OF ELECTRONICS AND MECHANICAL ENGINEERING

Second/First Semester

	L	T	P	C
Course Code: DIP205/105	**4**	**-**	**-**	**4**

Course Contents:

BASICS OF ELECTRONICS ENGINEERING

Unit I

Electronic Component & Voltage and Current Sources:- Application of Electronics in different fields, Brief introduction to active and passive components, Resistor working, specification, testing & colour coding of resistor, Capacitor. Working, specification testing & colour coding, inductor working, RF coils, transformer. Concept of constant voltage & current sources, concept of practical voltage & current sources, conversion of voltage to current & current to voltage sources. **(8 Lectures)**

Unit II

Semiconductor Diode:- P-N junction diode, mechanism of current flow in P-N junction, drift and diffusion currents, depletion layer, potential barrier, breakdown, semiconductor diode characteristics, P-N junction diode as rectifier, half wave rectifier, full wave rectifier, bridge rectifier, different types of diode: power diode, zener diodes, varactor diodes, tunnel diode, LED's and photo diodes. **(8 Lectures)**

Unit III

Introduction to Bipolar Transistor Biasing and Stabilization of Operating Point:- Concept of bipolar transistor as a two junction and three terminal device having two kinds of charge carriers, PNP and NPN transistors, their symbols, concept of leakage current, effect of temperature on leakage of current, common base configurations (CB), common emitter configuration (CE), common collector configuration, different types of biasing circuits for fixing the operation points, single stage CE amplifier circuit with proper biasing components. **(8 Lectures)**

Basics of Mechanical Engineering

Unit IV

Fluid Mechanics:- Introduction: Definition of fluid, Real fluid, fluid properties, fluid pressure and its measurement. Atmosphere, Absolute, Gauge and vacuum pressure. Buoyancy and floatation, Metacentre and Metacentric height, Suitability of submerged and floating bodies.

Fluid flow, types of fluid flow, velocity and acceleration of fluid elements. Path line, stream line, streak line, basic principles of fluid flow. Continuity equation Bernoulli's equation, flow measurement, Introduction of Hydraulic machines, turbines and pumps. **(8 Lectures)**

Unit V

Thermodynamic:- Basic concept and definitions. Macroscopic and microscopic approach. Thermodynamics systems, boundary, surrounding and universe, properties states, path process, cycle, quasistatic process, Reversible and Irreversible process. Thermodynamics laws-zeroth. First, Second, and third laws work and heat energy.

Heat engine and refrigeration, Carnot heat engine, I.C. engines. Types of I.C. engines.

(8 Lectures)

Unit VI

Simple Mechanism:- Introduction, Kinetic link. Types of link, Difference between machine and structure, kinetic pairs, types of constrained motions, kinetic chains, types of joints in a chain, number of degree of freedom for plane mechanisms. Types of kinetic chains, Grashof's law Cam and followers: classification of Cam and Follower. **(8 Lectures)**

Project work

A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 – 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

Text Books

1. Garg R.P., *Elements of Mechanical Engineering*, Standard Publishers Distributors, Delhi.
2. Sharma Sanjay, *Basic Electronics*, Publication of Engineering & Computer.

BASICS OF ELECTRICAL AND CIVIL ENGINEERING

Second/First Semester

	L	T	P	C
Course Code: DIP204/104	**4**	**-**	**-**	**4**

Course Contents:

Unit I

BASICS OF ELECTRICAL QUANTITIES :- Different forms of energy, Advantages of electrical energy, Uses of electrical energy, Basic concept of charge, Current, Voltage, Resistance Power, Energy and their units.

BATTERIES :-Basic idea about primary and secondary cells, Working principle, Construction and Application of lead acid, Nickel cadmium and Silver Oxide Cells. **(8 Lectures)**

Unit II

DC CIRCUIT:- Ohm's Law, Resistance in series and Parallel, Voltage and current division rule, Kirchhoff's Laws and their application in solving simple D. C. Network.

AC CIRCUIT:-Concept of alternating current and voltage, Equation of instantaneous values. Average rules, R.M.S. value, Form Factor and peak factor of sinusoidal waveform. Simple R-L-C Series circuit concept of three phase A.C. **(8 Lectures)**

Unit III

Magnetic Circuits:- Magnetic flux, flux density, field intensity, B-H Curve, difference between magnetic and electric circuit, Faraday's law, Fleming right hand, left hand rule, Lenz law, thumb rule, self and mutual, inductance, induced emf, energy stored in magnetic circuit. **(8 Lectures)**

Basics of Civil Engineering

Unit IV

- Classification of soil. Elementary ideas of Engineering properties of soil. Bearing capacity of soil.

- Geological consideration for site selection. Difference between Map & plan Engineering scales. **(8 Lectures)**

Unit V

- Foundation: Definition of foundation, classification, shallow and deep foundation and their common types, use of Machine foundation Black cotton soil foundation, walls their classification, load bearing, Non load bearing partition and cavity wall. **(8 Lectures)**

Unit VI

- Most common type of masonry used in civil engineering works. Different types of mortars used in masonry work, brick masonry, Stone masonry, concrete block masonry, Bonds used in brick masonry, English & Flemish bonds, elevation, plan of one & one and half brick thick wall laying in English bond two course only. Cross section of wall of two story building. Showing different component. **(8 Lectures)**

Project work

A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 – 5 on each topic. The topic should be related to

the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

Text Books:

1. Narendra Kumar*, Basic Electrical Engineering*, Asian Publishers, Muzaffernagar.
2. Gupta D.V.*, General Civil Engineering*, Asian Publishers, Muzaffernagar.

Ref Books:

1. Therja B.L.*, Fundamental of Electrical Engineering*, S.Chand & Co., Delhi.
2. Punmia B.C.*, Building Construction*, Laxmi Publication Pvt. Ltd., New Delhi.

Applied Mechanics
Second/First Semester

	L	T	P	C
Course Code: DIP207/107	**4**	**-**	**-**	**4**

Course Contents:

Unit I

Force Analysis: - System of forces, concept of coplanar and non-coplanar forces including parallel forces. Concurrent and non-concurrent forces, resultant forces, Equilibrium of forces, Law of parallelogram of forces, Law of triangle of forces and its converse, Law of polygon of forces, solution of simple engineering problems by analytical and graphical methods. Such as simple wall crane, jib crane etc. Determination of resultant of any number of forces in one plane acting upon a particle, Conditions of equilibrium of coplanar concurrent forces system.

(10 Lectures)

Unit II

Moment and couple, General conditions of Equilibrium Moment and couple Generalized theorem of moments, Application to simple problem on levers-Bell crank Lever, compound lever, steel yard, beams & wheels, lever safety valve, moment of couple, properties of a couple, simple applied problem such as pulley and shaft.

General conditions of Equilibrium : Rigid body under the action of coplanar forces, statement of forces, Laws of equilibrium: moment law of equilibrium, application of above on body.

(10 Lectures)

Unit III

Friction: Types of friction: Stoical Limiting and dynamical friction statement of Laws of sliding friction, coefficient of friction, angle of friction: Problems on equilibrium of a body resting on a rough inclined plane, simple problems on friction, conditions of sliding and toppling.

(10 Lectures)

Unit IV

Stress and strain: Concept of stress and strain. Various types of stress and Strains, Definition of tension, compression, shear, bending, torsion, concept of volumetric and lateral strain, Poisson's ratio, changes in dimensions and volume of a bar under direct load (Axial and along all the three Axes), ultimate stress, Working stress, elasticity, Hook's Law, Load deformation diagram for mild steel and cast iron. Definition of modulus of elasticity, Yield point, modulus of rigidity and bulk modulus, stress & strain for homogeneous material and composite section. **(10 Lectures)**

Unit V

Beam and trusses; Definition of statically determinate and indeterminate trusses. Types of supports tie and struts, Bow's notation space diagram, polar diagram, funicular polygon, calculation of reaction at the support of cantilever and simply supported beams and trusses graphically and Analytically, Graphical solution of simple determinate trusses with reference to forces diagram for determining the magnitude and nature of forces in its various members Analytical method; Methods of joints and method of sections (Simple problems only).

(10 Lectures)

Project work

A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 – 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

Text Books

1. Bansal R.K., *Engineering Mechanics*, Laxmi Publication Pvt Ltd., Delhi.
2. Khurmi R.S., *Engineering Mechanics*, S. Chand & Co., Delhi.
3. Kapoor J.K., *Applied Mechanics*, Bharat Bharti Prakashan, Meerut.
4. Yadav K.S., *Engineering Mechanics*, Vayu Education of India.

Ref Books:

1. Kumar D.S., *Engineering Mechanics*, S.K. Kataria & Sons, Delhi.

CONCEPTS IN INFORMATION TECHNOLOGY

Second/First Semester

	L	T	P	C
Course Code: DIP206/106	**4**	**-**	**-**	**4**

Course Contents:

Unit I

Concepts in computer & Programming; Computer Appreciation: Definition of electronic Computer, Generations, Characteristic and Application of Computers, Computer Hardware, CPU, RAM/ROM, Various I/O devices, Software Definition, Role and Categories. **(Lectures 08)**

Unit II

Computer Languages: Classification & Program Methodology, Generation of Language, Translators, Interpreters, Assemblers Compilers, Software Development life cycle: Waterfall model. Software Testing.

Number System: Various codes, decimal, binary, octal, hexadecimal conversion. **(Lectures 08)**

Unit III

Internet and Web Technologies; Internet & World Wide Web: Hypertext Marks Language, WWW, Gopher, FTP, Web Browsers, Search Engines, Email. **(Lectures 08)**

Unit IV

Concepts in Operating System System & Data Management: Elementary Concepts in Operating System, textual Vs GUI Interface, Introduction to DOS, MS Office Tools MS WORD, MS EXCEL, MS Power Point. **(Lectures 08)**

Unit V

Application of IT to Areas like E Commerce, Multimedia, and Entertainment.

Information Representation: Introduction to Information representation in Digital Media, Text, Image, graphics, Animation, Audio, Video etc, Introduction to JPEG & MPEG.

(Lectures 08)

Project work

A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 – 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

Text Books

1. Yadav DS, *Foundations of IT*, New Age, Delhi.
2. Curtin, *Information Technology: Breaking News*, Tata Mo Grew Hill.
3. Rajaraman, *Introduction to Computers*, Prentice-Hall India

Reference Books

1. Nelson, *Data Compression*, BPB.
2. Peter Nor tans, *Introduction to Computers*, TME.
3. Leon & Leon, *Fundamental of Information Technology,* Vikas Publishing.
4. Kantar, *Managing Information System*.
5. CIS Tams, *Internet, An Introduction*, Tata Mc Grew Hill.

Foundation English –II
Second Semester

Course code: DIP 208	L	T	P	C
	2	0	2	3

Course Content:

Unit I

Functional Grammar : Preposition, preposition of time & date, of travel & movement, other details of preposition ; Tense, Tense structure, Modals : use of can, could, may, might, should, should be, must, must be, has, have & had. **(8 hours)**

Practical (oral): Making the students use the above grammatical rules in different sentences of their own. **(2 hours)**

Unit II

Functional English: Writing Application – leave application, application for fee concession, change in subject, issuing character certificate, etc.; Letter writing : Types of Letters, Business Letters, Formatting of Letters. **(8 hours)**

Practical (oral): Making the students write different applications & Letters in the practical classes. **(2 hours)**

Unit III

Paragraph Writing: What is Paragraph Writing? Structure of Paragraph, coherence and unity, Development of Paragraph, Writing a Paragraph. **(8 hours)**

Practical (oral): Making the students write Paragraph on any topic in the practical classes. **(2 hours)**

Unit IV

Precis Writing: What is Précis? Techniques of Précis Writing, Writing a Précis. **(8 hours)**

Practical (oral): Making the students Write Précis in the practical classes. **(2 hours)**

Recommended Books:

1. Wren & Martin : High School English Grammar & Composition, S.Chand & Co., New Delhi
2. Chaturvedi P.D. – Business Communication – Pearson Education, New Delhi
3. Raman Meenakshi & Sharma Sangeeta – Technical Communication- Principles & Practices O.U.P.N. Delhi.
4. Better Your English- A Workbook for 1st year Students- Macmillan India, New Delhi.

NOTE:

This syllabus has been designed to improve the oral and written communication skills of students. The faculty members should put emphasis on practical (oral) activities for generating students' interest in language learning.

*** Latest editions of all the suggested books are recommended.**

PHYSICS LAB

Second/First Semester

	L	T	P	C
Course Code: DIP251/151	**-**	**-**	**3**	**2**

List of Experiments

1. To find the diameter of wire using a screw gauge.
2. To find volume of solid cylinder and hollow cylinder using a vernier caliper.
3. To determine the thickness of glass strip and radius of curvature of a concave surface using a spherometer.
4. To verify the parallelogram law of forces.
5. To determine the atmospheric pressure at a place using Fortin's Barometer.
6. To determine the surface tension of a liquid by capillary rise method.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (40 MARKS)			VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (25 MARKS)	ATTENDANCE (10 MARKS)	QUIZ (5 MARKS)		

External Evaluation (50 marks)

The evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

CHEMISTRY LAB

Second/First Semester

	L	T	P	C
Course Code: DIP252/152	**-**	**-**	**3**	**2**

LIST OF PRACTICAL

1. To determine the Chloride content in supplied water sample by using Mohr's methods.
2. Determination of temporary hardness of water sample by O-Hener's method.
3. To determine the total hardness of water sample in terms of CaCO3 by EDTA titration method using EBT indicator.
4. To determine the percentage of available Chlorine in the supplied sample of Bleaching powder.
5. Identification of Nitrogen, Sulphur and Halogens in an organic compound.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

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External Evaluation (50 marks)

The evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

ELECTRONICS ENGINEERING LAB
Second/First Semester

	L	T	P	C
Course Code: DIP254/154	**-**	**-**	**4**	**2**

LIST OF PRACTICAL

Practical No.- 1
Object :- To study, Identification & testing of passive Components, Resistor Compactor.
Practical No.- 2
Object:- Draw the V-I characteristics of P-N Junction Diode in forward and reverse Bias.

iii) Silicon
iv) Germanium

Practical No.- 3
Object :- Draw the input and output wave form of Half wave rectifier using semi conductor diode.
Practical No.- 4
Object :- Draw the input and output wave form of full wave rectifier using semi conductor diode.
Practical No.- 5
Object :- Draw input and output characteristics of Transistor in common base configuration.
Practical No.- 6
Object :- Draw the V-I characteristics of zener diode.

Evaluation of Practical Examination:
Internal Evaluation (50 marks)
Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

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External Evaluation (50 marks)
The evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

ELECTRICAL ENGINEERING LAB

Second/First Semester

	L	T	P	C
Course Code: DIP253/153	**-**	**-**	**4**	**2**

PRACTICALS:

1) To verify the Ohm's Law.
2) To verify that $R_e = R_1+R_2+\ldots\ldots$ where R_1, R_2 etc. are resistance connected in series.
3) Verification of Kirchhoff's current and Voltage Law's applied to D.C. circuit.
4) To observe the A.C. and D.C. waveshape on C.R.O.
5) To study different types of practical transformer.
6) To verify that $1/R_e=1/R_1 + 1/R_2+\ldots..1/R_m$. Where R_1, $R_2\ldots..R_m$ are all resistances connected in parallel.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

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External Evaluation (50 marks)

The evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

INFORMATION TECHNOLOGY LAB
Second/First Semester

	L	T	P	C
Course Code: DIP255/155	**-**	**-**	**4**	**2**

1. Create a document using functions: Save as, page number, Bullets and numbering.
2. Create a document using styles and Formatting options.
3. Create a document using different fonts.
4. Create a document, using the function page set up, & page preview, then print that document.
5. Create a table & perform operation in it.
6. Create a table, chart in excel and implement all formula as addition, subtraction, multiplication and division.
7. How to use Mail Merge in MS Word.
8. Create a Power point presentation using slide designing.
9. Create, Save & print the power point presentation.
10. Create a power point presentation using clipart, Word art gallery & then add transition & Animation **effects.**

Evaluation of Practical Examination:
Internal Evaluation (50 marks)
Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (40 MARKS)			VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (25 MARKS)	ATTENDANCE (10 MARKS)	QUIZ (5 MARKS)		

External Evaluation (50 marks)
The evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

APPLIED MECHANICS LAB

Course Code: DIP156/256

L	T	P	C
0	0	4	2

LIST OF EXPERIMENTS

1. To verify the law of Polygon of forces.
2. To verify the law of parallelogram and triangle of forces.
3. To verify the law of principle of moments.
4. To find the coefficient of friction between wood, steel, copper and glass.
5. To find the reaction at supports of a simply supported beam carrying point loads only.
6. To find the forces in the jib & tie of a jib crane.
7. To find the forces in the members of a loaded roof truss. (King / Queen post truss)

Evaluation of Practical Examination:
Internal Evaluation (50 marks)
Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

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External Evaluation (50 marks)
The evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

ENGINEERING DRAWING

Second/First Semester

	L	T	P	C
Course Code: DIP258/158	**2**	**-**	**6**	**5**

1. Drawing, instruments and their uses.

1.1. Introduction to various drawing, instruments.
1.2. Correct use and care of Instruments.
1.3. Sizes of drawing sheets and their layouts.

2. (a) Lettering Techniques **1 Sheet**

Printing of vertical and inclined normal single stroke capital letters and numbers.

(b) Conventional Representatfion:

Types of lines, Conventional representation of materials.

3. Introduction to Scales **1 Sheet**

Necessity and use, R F

Types of scales used in general engineering drawing. Plane, diagonal and chord scales.

4. (a) Principles of Projection

Orthographic, Pictorial and perspective.
Concept of horizontal and vertical planes.
Difference between I and III angle projections.
Dimensioning techniques.

(b) Projections of points, lines and planes. **1 Sheet**

5.Orthographic Projections of Simple **2 Sheet**

Geometrical Solids: Edge and axis making given angles with the reference planes. Face making given angles with reference planes. Face and its edge making given angles with reference planes.

6. Section of Solids **1 Sheet**

Concept of sectioning

Cases involving cutting plane parallel to one of the reference planes and perpendicular to the others. Cases involving cutting plane perpendicular to one of the reference planes and inclined to the other plane, true space of the section.

7. Development of Surfaces **1 Sheet**

Parallel line and redial line methods of developments.

Development of simple and truncated surfaces (Cube, prism, cylinder, cone and pyramid).

8. Isometric Projection. **1 Sheet**

Isometric scale

Isometric Projection of solids.

9. ORTHOGRAPHIC PROJECTION : **1 Sheet**

Nut and Bolt, Rivets and Riveted Joints.

10. PRACTICE ON AUTO CAD:

To draw geometrical figures using line, circle, arc, polygon, ellipse, rectangle – erase and other editing commands and snap commands (two dimensional drawing only).

Text Books:

1. Bhatt N.D., *Engineering Drawing*, Charotar Publishing House Pvt. Ltd., Anand.
2. Upadhayay S.D., *Engineering Drawing*, Bharat Bharti Prakashan, Merrut.
3. Goyal B.K., *Engineering Drawing*, Asian Publishers, Muzaffarnagar.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (40 MARKS)			VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (25 MARKS)	ATTENDANCE (10 MARKS)	QUIZ (5 MARKS)		

External Evaluation (50 marks)

The evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

WORKSHOP PRACTICE

Second/First Semester

	L	T	P	C
Course Code: DIP257/157	**-**	**-**	**8**	**4**

1. Carpentry Shop Work:

Ex-1 Planning and sawing practice.
Ex-2 Making of Lap Joint.
Ex-3 Making of Mortise and tendon Joint
Ex-4 Making of Briddle Joint.
Ex-5 Making of Dovetail Joint.
Ex-6 Making of any one utility articles such as wooden-picture frame, hanger, peg, name plates etc.

1. Painting and Polishing:

Ex-1 To prepare a wooden surface for painting apply primer on one side and to paint the same side. To prepare French polish for wooden surface and polish the other side.
Ex-2 To prepare metal surface for painting, apply primer and paint the same.
Ex-3 To prepare a metal surface for spray painting, Ist spray primer and paint the same by spray painting gun and compressor system.
Ex-4 Buffing and abrasive polishing of brass job.
Ex-5 Zinc coating by electroplating method.
Ex-6 To prepare any utility job.
The sequence of polishing will be as bellow:
iv) Abrasive cutting by leather wheel.
v) Polishing with hard cotton wheel and with polishing material.
vi) Buffing with cotton wheel or buff wheel.

2. Sheet Metal Working and Soldering:

Ex-1 Cutting, shearing and bending of sheet.
Ex-2 To prepare a soap case by the metal sheet.
Ex-3 To make a funnel with thin sheet and to solder the seam of the same.
Ex-4 To make a cylinder and to solder the same.
Ex-4 Preparation of different type of joints such as Lap joint-single seam, double seam. Hemp and wired joints.
Ex-5 Study and sketch of various types of stakes.

3. Fitting Shop:

Ex-1 Hacks awing and chipping of M.S. flat.
Ex-2 Filing and squaring of chipped M.S. job.
Ex-3 Filing on square or rectangular M.S. piece.
Ex-4 Making Bolt & Nut by Tap and Die set.
Ex-5 To drill a hole in M.S. Plate and taping the same to create threads as per need.
Ex-6 Utility article-to prepare a screw driver or paper weight, double open mouth spanner for 18" hexagonal head of a bolt.

5 A. Plumbing Work :

Ex-1 Cutting and Threading practice for using socket, elbow and Tee etc. and fit it on wooden practice board.
Ex-2 Study of-Bib cock, cistern or stop cock, wheel valve and gate valve etc.

5 B. Foundry Shop Work :

Ex-1 Study & sketch of the foundry.

Ex-2 Study & sketch of Copula & Pit Furnace.
Ex-3 To Prepare the green moulding sand and to prepare moulds (single piece and double piece pattern sweep mould).
Ex-4 Casting of non ferrous (lead or aluminum) as per exercise 3.

6. Smithy Shop work :

Ex-1 To prepare square or rectangular piece by the M.S. rod.
Ex-2 To braze M.S. Flats/Tipped tools on M.S. shank.
Ex-3 To make a screw driver with metallic handle.
Ex-4 To make a square or hexagonal head bolt.
Ex-5 To make a ring with hook for wooden doors.
Ex-6 Utility Article-to prepare a ceiling fan hook.

7. Welding Shop:

Ex-1 Welding practice-Gas and Electric.
Ex-2 Welding for lap joint after preparing the edge.
Ex-3 Welding of Butt joint after preparation of the edge.
Ex-4 'T' joint welding after preparation of edge.
Ex-5 Spot welding, by spot welding Machine.
Ex-6 Welding of Plastic by Hot strip method.

8. Machine Shop :

Ex-1 Study & sketch of Lathe machine.
Ex-2 Plane and step turning & knurling practice.
Ex-3 Study & sketch of planning machine and plane a rectangle of cast iron.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

<table>
<tr><td colspan="3">PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (40 MARKS)</td><td rowspan="2">VIVA
(10 MARKS)</td><td rowspan="2">TOTAL
INTERNAL
(50 MARKS)</td></tr>
<tr><td>EXPERIMENT
(25 MARKS)</td><td>ATTENDANCE
(10 MARKS)</td><td>QUIZ
(5 MARKS)</td></tr>
</table>

External Evaluation (50 marks)

The evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

SURVEYING – I

Third Semester

	L	T	P	C
Course Code: DCE301	**3**	**1**	**-**	**3**

Course Contents:

Unit I

Introduction

Concept of surveying, purpose of surveying, Measurements: linear and angular, units of measurement, instruments used for taking these measurements. Classification of survey based on instruments. Basic principles of surveying.

Chain Surveying

Purpose of chain surveying, Principles of chain surveying, Equipment used in chain surveying Viz. Chains, tapes, ranging rods, arrows, pegs, cross staffs, Indian optical square their construction and uses.

Different operations in chain surveying: Ranging (direct/indirect), Offset (perpendicular/oblique) Chaining (flat and sloping ground) Conducting chain survey over an area. Recording the field data, plotting the chain survey, conventional sign. Obstacles in chain surveying.

(a) Errors in chain surveying.

(b) Correction for erroneous length of chain, simple problems. Testing and adjustment chain.

(12 Lectures)

Unit II

Compass Surveying- I

Purpose of compass surveying. Construction and working of prismatic compass. Use of prismatic Compass, Method of setting and taking observations. Concept of following:

(a) Meridian – Magnetic, true and arbitrary.

(b) Bearing – Magnetic, True and Arbitrary.

(c) Whole circle Bearing and Reduced Bearing.

(d) Fore and Back bearing. **(8 Lectures)**

Unit III

Compass Surveying- II

Local attraction – causes, detection, errors and correction. Problems on local attraction, magnetic declination and calculation of included angles in a compass traverse. Concept of a traverse – Open and closed traverse. Traversing with a prismatic compass. Checks for an open and closed traverse. Plotting of a traverse – by included and deflection angles. Concept of closing error. Adjustment of traverse graphically. Errors in compass surveying. Testing and adjustment of a prismatic compass. Use of surveyor's compass and its construction details, comparison with prismatic compass.

(10 Lectures)

Unit IV

Leveling- I

Purpose of leveling, concept of a level surface, horizontal surface, vertical surface, datum, reduced level and bench marks, principle and construction of dumpy and I.O.P. (Tilting) levels. Concepts of line of collimation, axis of the bubble tube, axis of the telescope and vertical axis. Leveling staff. (i) single piece (ii) Folding (iii) sop with pattern.(iv) Invar precision staff. Temporary adjustment: setting up and leveling, adjusting for parallax of Dumpy and I.O.P. level.

(8 Lectures)

Unit V

Leveling- II

Differential leveling concept of back sight, fore sight, intermediate sight, station, change point, height of instrument. Level book and reduction of levels by (a) Height of collimation method and (b) Rise and fall method. Arithmetic checks. Problem on reduction of levels. Fly leveling, check. leveling and profile leveling (L-section and X-section) Errors in leveling, and precautions to minimize them and permissible limits. Reciprocal leveling. Difficulties in leveling Concept of curvature and refraction, testing and adjustment of dumpy and I.O.P. level. Numerical problems.

(10 Lectures)

Project work

A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 – 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

Text Books:-

1. Arora K.R., *Surveying Vol. I & II*, Standard Book House, Delhi.
2. Kanetkar T.P., *Surveying & Levelling Vol. I & II*, Pune Vidyarthi Griha Prakashan, Pune.
3. Basak P.N., *Surveying & Leveling*, Tata Mc Graw – Hill Publishing Co. Ltd., Delhi.
4. Agarwal G.D., *Surveying Vol. I & II*, Unitech Publishers, Lucknow.
5. Dass G., *Surveying Vol. I & II*, Nav Bharat Prakashan, Meerut.

Reference Books:-

1. Punmia B.C., *Surveying Vol. I & II*, Laxmi Publications (P) Ltd. New Delhi.
2. Guggal S.K., *Surveying Vol. I & II*, New Age International Publishers New Delhi.
3. Chandra A.M., *Surveying Problem Solving with Theory & Objective Type Questions*, New Age International Publishers New Delhi.

STRENGTH OF MATERIALS

Third Semester

	L	T	P	C
Course Code: DME301	**4**	**1**	**-**	**4**

Course Contents:

Unit I

Bending Moment and Shear Force:

Concept of a beam, and supports (Hinged, Roller and Fixed). Types of Beams: Simply supported, cantilever, fixed, overhang and continuous beams. Types of loads (distributed and point). Concept of Bending Moment & Shear Force. Sign conventions. Bending moment and shear force diagrams for cantilever, simply supported and overhanging beams subjected to uniformly distributed and concentrated loads. Relationship between load, shear force and bending moment. Point of maximum B.M. and contra flexure. **(10 Lectures)**

Unit II

Bending and Shear Stresses:

Assumptions of theory of simple bending. Derivation of the equation. M/I=F/Y=E/R. Concept of centroid and second moment of area, Radius of gyration, Theorems of parallel and perpendicular axes, Second Moment of area for

sections: rectangle, triangle, circle, trapezium, angle, Tee, I, Channel and compound sections. Moment of resistance, section modulus and permissible bending stresses, Bending stresses in circular rectangular, I,T and L section. Comparison of strength of the above sections. Concept of shear stresses in beams, Shear stress distribution in rectangular, I and T section.

(10 Lectures)

Unit III

Combined Direct & Bending Stresses and strain Energy

Concentric and eccentric loads, eccentricity, effect of eccentric load on the section, middle third rule; stresses due to eccentric loads. Examples in the case of short columns, chimneys and dams. Meaning of strain energy and resilience. Derivation of formula for resilience of a uniform bar in tension. **(10 Lectures)**

Unit IV

Slopes and Deflections of Beams:

Definition of slope and deflection, sign convention. Circular bending. Calculation of maximum slope and deflection for the following standard cases by moment area method.

(1) Cantilever having point load at the free end.**,** Cantilever having point load at any point of the span., Cantilever with uniformly distributed load over the entire span., Cantilever having U.D.L. over part of the span from free end Cantilever having U.D.L. over a part of span from fixed end

(2) Simply supported beam with point load at centre of the span.

Simply supported beam with U.D. load over entire span.

NOTE: All examples will be for constant moment of inertia without derivation of formula.

(8 Lectures)

Unit V

Columns & Struts:

Definition of long column, short column and strut, slenderness ratio, equivalent length, critical load, collapse Load, End conditions of column. Application of Eular's and Rankine's formula (no derivation), simple numerical problems based on Euler's and Rankine's formulae.

Torsion

Definition of torque and angle of twist. Derivation of torsion equation. Polar moment of inertia. Strength of hollow and solid shaft, advantage of a hollow shaft over a solid shaft. Comparison of weights of solid and hollow shafts for same strength. Horse Power transmitted. Calculation of shaft diameter for a given Horse Power. **(10 Lectures)**

Project work

A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 – 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

Text Books:-

1. Rajput R. K., *Strength of Materials*, S.Chand & Co. Ltd., Delhi.
2. Kapoor J.K., *Strength of Materials*, Asian Publication, Muzaffarnagar.
3. Punmia B.C., *Strength of Materials*, Laxmi Publication, Delhi.

Reference Books:-

1. Ramamarutham S., *Strength of Materials*, Dhanpat Rai & Sons, Delhi.

BUILDING CONSTRUCTION – I

Third Semester

	L	T	P	C
Course Code: DCE302	**3**	**1**	**-**	**3**

Course Contents:

Unit I

Introduction: Definition of a building, classification of building based on occupancy. Different parts of a building. Orientation of buildings. Site selection.

Exposure to building bylaws/master plan and building approval.

Walls Purpose of walls: Classification of walls – Load Bearing and Non Load Bearing, Dwarf wall. Classification of walls as per materials of construction, brick, stone, reinforced brick, reinforced concrete, precast hollow and solid concrete block and composite masonry walls.

(a) Brick masonry – Definition of terms; mortar, bond, facing, backing, hearting, column, pillar, jambs, reveals, soffit, plinth, plinth masonry, Brick: header, stretcher, bed of brick, bat, queen closer, king closer, frog and quoin. **(10 Lectures)**

Unit II

(b) Bond – Meaning and necessity: Types of bond and their suitability (English, Flemish, Header and Stretcher) 1, 1-1/2 and 2 Brick thick walls in English Bond. T and right angled corner junctions. Sketches for 1, 1-1/2 and 2 brick square pillars in English Bond.

(c) Construction of Brick walls – Method of laying bricks in walls, precautions observed in the Construction of walls, Method of bonding new brick work with old (Toothing, raking back and block bonding).

(d) Construction and Expansion Joints. **(10 Lectures)**

Unit III

Stone Masonry

(a) Glossary of terms – Natural bed of a surface, bedding planes, string course, corbel, cornice, block – in course, grouting, moldings, templates, throttling, through stones, parapet and coping.

(b) Types of Stone Masonry: Rubble Masonry; random and coursed, Ashlar Masonry Ashar fine, Ashlar rough tooled Ashler facing, specifications for coursed rubble masonry, principles to be observed in construction of stone masonry walls. Partition walls: Constructional details, suitability and uses of brick and wooden partition walls. **(10 Lectures)**

Unit IV

Mortars – preparation, use and average strength of cement, lime, lime cement, lime surkhi and mud mortar. Scaffolding: Constructional details and suitability of mason's Brick Layers and Tubular scaffolding. Shoring & under pinning: Types and uses. Safety in construction of low rise and high rise buildings.

Arches and Lintels: Meaning and use of Arches and Lintels. Glossary of terms used in Arches and Lintels – Abutment, Pier, Arch ring, Intrados, Soffit Extrados, Voussoiers, Springer, Springing line, Crown, Key stone, Skew back, Span, Rise, Depth of an Arch, Haunch, Spandrel, Jambs, Bearing thickness of lintel, effective span.

Arches: Brick arches and their construction. **(10 Lectures)**

Unit V

Doors and Windows: Glossary of terms, used in Doors and windows.

Doors – Name; uses and sketches of Metal doors; Ledged and Battened Doors; Framed and Paneled doors, glazed and paneled doors, flush doors, collapsible doors, Rolling steel shutters side

sliding doors, Door frames, PVC shutters & metal doors. Windows – Name, uses and sketches of metal windows, fully paneled windows, fully glazed windows, casement windows, fanlight windows and ventilators, sky light window frames, Louvered shutters (emphasis shall be given for using metals, plastics etc. in place of timber).

Project work

A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 – 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

Text Books:-

1. Kumar Susheel, *Building Construction*, Standard Publishers Distributers, Delhi.
2. Singh Gurcharn, *Building Construction*, Standard Publishers, Delhi.
3. Gupta D.V., *Building Construction*, Asian Publishers, Muzaffarnagar.

Reference Books:-

1. Punmia B.C., *Building Construction*.

HYDRAULICS & HYDRAULIC MACHINES

Third Semester

	L	T	P	C
Course Code: DME302	**4**	**1**	**-**	**4**

Course Contents:

Unit I

Properties of Fluids: **Fluids :** Real fluid, ideal fluid., Fluid Mechanics, Hydraulics, Hydrostatics, Hydro kinematics.**,** Mass density, specific weight, specific gravity, cohesion, adhesion, viscosity, surface tension, capillarity, vapor pressure and compressibility. Hydrostatic Pressure: Pressure, intensity of pressure, pressure head, Pascal's law and its applications. Total pressure, resultant pressure, and centre of pressure. Total pressure and centre of pressure on vertical and inclined plane surfaces: Rectangular**,** Triangular, Circular. **(10 Lectures)**

Unit II

Measurement of Pressure: Atmospheric pressure, gauge pressure, vacuum pressure and absolute pressure. Use of simple manometer, differential manometer and mechanical gauges. Measurement of pressure by manometers and pressure gauges. Fundamental of Fluid Flow, Types of Flow, Steady and unsteady flow, Laminar and turbulent flow Uniform and non-uniform flow. Discharge and continuity equation (flow equation) Types of hydraulic energy. Potential energy, Kinetic energy**,** Pressure energy Bernoulli's theorem; statement and description (without proof of theorems). Venturimeter (horizontal and inclined) **(10 Lectures)**

Unit III

Orifice: Definition of Orifice, and types of Orifices, Hydraulic Coefficients. Large vertical orifices. Free, drowned and partially drowned orifice. Time of emptying a rectangular/circular tanks with flat bottom.

Flow through Pipes: Definition, laminar and turbulent flow explained through Reynold's Experiment. Reynolds Number, critical velocity and velocity distribution. Head Losses in pipe lines due to friction, sudden expansion and sudden contraction entrance, exit, obstruction and change of direction (No derivation of formula). Hydraulic gradient line and total energy line. **(10 Lectures)**

Unit IV

Flow through open channels:

Definition of a channel, uniform flow and open channel flow. Discharge through channels using**.** **(i)** Chezy's formula (no derivation) **(ii)** Manning's formula

Most economical sections: (i) Rectangular **(ii**) Trapezoidal

Flow Measurements: Measurement of velocity by Pitot tube **,** Measurement of Discharge by a Notch, Difference between notches and orifices. Discharge formulae for rectangular notch, triangular Notch, trapezoidal notch, and conditions for their use. (with derivation) Measurement of discharge by weirs. Difference between notch, weir and barrage. Discharge formula for free, drowned, and broad crested weir with and without end contractions; velocity of approach and condition of their use. **(10 Lectures)**

Unit V

HYDRAULIC MACHINE: Reciprocating pumps, Centrifugal pumps, Impulse Turbines, Reaction Turbines, Sketching and description of principles of working of above mentioned machines. **(8 Lectures)**

Project work

A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 – 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

Text Books:-

1. *Fluid Mechanics & Hydraulic Machines*, Laxmi Publaction (P) Ltd., New Delhi.
2. Vijay Gupta & Gupta S.K., *Fluid Mechanics*, New Age International Publishers, New Delhi.
3. Kapoor J.K., *Hydraulics*, Bharat Bharti Prakashan, Merrut.
4. Likhi S.K., *Hydraulics Laboratory Manual*, New Age International Publishers, New Delhi.

Reference Books:-

1. Garde R.J., *Fluid Mechanics*, New Age International Publishers, New Delhi.
2. Jagdish Lal, *Hydraulics & Hydraulic Machines*, Metropolitan Book Depot, Delhi.
3. Modi P.N., *Fluid Mechanics*, New Age International Publishers, New Delhi.

BUILDING MATERIAL
Third Semester

	L	T	P	C
Course Code: DCE303	**3**	**-**	**-**	**3**

Course Contents:

Unit I

Building Stone: Classification of Rocks: - Geological and physical classification, Testing of stones for specific gravity, Water absorption, Durability, Weathering.

Quarrying:- Basic Principles involved, Methods of quarrying, Blasting, where used Principles of ballasting, Line of least resistance, Drilling of quarrying, Blasting, where used, Principles of ballasting, Line of least resistance, Drilling of holes (Manually and mechanically), charging, tamping, Fugues and detonators, safety precaution, common explosives – only Name and their use.

Wedging:- Where used, Tools required and operation of wedging, stone Crushing; Process and equipment used, crushers, gridding mills.

Availability, Characteristics and uses of the following stone:-

Granite, Sand stone, Lime stone, Slate, basalt, trap quartzite and marble, Availability of different stones in the state. **(8 Lectures)**

Unit II

Bricks & clay Products:- Raw material for manufacture, Properties of good brick making earth, field-testing of brick clay. Manufacture of bricks, Preparation of clay-Manually/Mechanically.

Molding: hand molding and machine molding, drying of bricks, Burning of bricks, Types of Kilns, Bull's Trench Kiln and Hoffman's kiln, Process of burning, Size of standard Bricks, its classification of brick as per I.S. and testing of common building bricks as compressive strength, water absorption, effloresce test. **(8 Lectures)**

Unit III

Lime and Cement:- Lime:- Natural sources of lime, Definition of Quick, fat, hydraulic, hydrated lime, calcinations, slaking, manufacture of lime, process of setting and hardening action of lime field test of lime, pozzolonic material types, properties and uses.

Cement: Natural and artificial cement, Raw materials, manufacture of ordinary Portland cement, Flow diagram for dry and wet process, setting and hardening of cement. Types of cement, Properties of cement, Test of cement as per Indian standard. **(8 Lectures)**

Unit IV

Timber, Paints and Insulating Materials Timber:- Classification of Trees,- Cross Section of an Exogenous tree and explanation of terms, identification of different types of timber, teak, Chirr, Shisham, Sal, Mango, deodar, kail etc., Seasoning of Timber – Purpose, Types of seasoning, water, Air, Kiln, Chemical & solar Kiln seasoning.

Defects in Timber:- Decay in Timber, Preservation of timber, Method of treatment, Properties of good timber, common structural timber in India, Plywood, Veneers, Manufacture of plywood & its uses, Laminated Boards, Block Boards, Fiber Boards, Plastic Coated finishes, Water & fire resistant Plywood, PVC Boards.

Paints:- Various Types of Paints their function and properties, cement paints their properties and uses, Varnish & polish, Lacquers' and enamels their properties uses and trade names.

Insulating Material:- Properties, uses and requirement of heat and sound insulating materials, properties and uses of cork, Rockwool, Glass wool, Concrete, Aluminum foil, Asbestos sheets for ceiling & their commercial name. **(8 Lectures)**

Unit -V

Glass, Plastic and water Proofing Materials Glass:- Types of glasses and their properties: Sheet, plate frosted, wired fiber and bullet resisting glass colored glass and commercial size, forms & their use.

Plastic:- Properties and uses of plastic, Imported commercial product, use of plastic in civil engineering, Plastic Pipes, Taps, Valves, Plastic coated paper, Polythene sheets, Bakelite, thermocol, P.V.C. Rexene and Linoleum. Water Proofing Materials Properties and commercial trade name. **(8 Lectures)**

Project work

A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 – 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

Text Books:-

1. Gurcharan Singh*, Building Materials*, Standard Publishers Distributors, Delhi.
2. Rangwala S.C.*, Engineering Materials*, Charotar Publishing House Pvt. Ltd., Adand.
3. Mittal D.C.*, Engineering Materials*.

Reference Books:-

1. Kulkarni G.J.*, Engineering Materials*.

English Communication
Third Semester

Course Code: DIP 301	L	T	P	C
	2	0	2	3

Course Content:

Unit I

Functional Grammar: Active, Passive voice, Conditional Sentences, Syntax, Concord, Common Errors. **(8 hours)**

Practical (oral): To make students practice the above mentioned grammatical RULES in the practical classes. **(2 hours)**

Unit II

Communication: Meaning & Importance of Communication, Process of Communication, Language as a tool of Communication. **(8 hours)**

Practical (Oral): To make students speak on their understanding of Communication in English. **(2 hours)**

Unit III

Writing Skills: Reporting events, Writing newspaper reports, Bio-data making, Writing of C.V. & Resumes, Writing job application. **(8 hours)**

Practical (Oral): To make students practice writing on the above mentioned processes. **(2 hours)**

Unit IV

Listening Skills: The listening process, hearing & listening, types of listening, Barriers to listening. **(8 hours)**

Practical (oral): To make student develop the skills of listening & thus improve their speaking skills. **(2 hours)**

Recommended Books:

1. Raman Meenakshi & Sharma Sangeeta – Technical Communication – Principles & Practices, - ONP, N. Delhi
2. Wren & Martin : High School English Grammar & Composition- S.Chand & Co. N.Delhi

NOTE:

This syllabus has been designed to improve the oral and written communication skills of students. The faculty members should put emphasis on practical (oral) activities for generating students' interest in language learning.

*** Latest editions of all the suggested books are recommended.**

SURVEYING LAB – I

Third Semester

	L	T	P	C
Course Code: DCE 351	**-**	**-**	**6**	**3**

Chain surveying

Ex. (i) (a) Ranging a line.
(b) Chaining a line and recording in the field book.
(c) Testing and adjustment of chain.

Ex. (ii) (a) Chaining of a line involving reciprocal ranging
(b) Taking offsets and setting out right angels with cross staff and Indian optical square.

Ex. (iii) Chain survey of a small area.

Plate -I

Ex. (iv) Chaining a line involving obstacles in ranging.

Compass survey

Ex. (v) (a) Setting the compass and taking observations .
(b) Measuring angle between the lines meeting at a point by prismatic compass.

Ex. (vi) Traversing with the prismatic compass and chain of a closed traverse.
(Recording and plotting by included angles).

Plate –II

Ex. (vii) Traversing with the prismatic compass and chain of a closed and open traverse.
(Recording and plotting by deflection angles).

Plate III

Ex. (viii) Determination of local traction at a station by taking fore and back bearing.

Ex. (ix) To find true bearing of a line at a place.

Leveling:

Ex. (x) To find difference of level between two distant points by taking staff reading on different stations from the single setting.

Ex. (xi) To find difference of level between two points by taking at least four change points .

Ex. (xii) Longitudinal sectioning of a road.

Plate IV

Ex. (xiii) Cross- sectioning of a road.

Plate V

Ex. (xiv) Setting a gradient by I.O.P. level.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (40 MARKS)			VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (25 MARKS)	ATTENDANCE (10 MARKS)	QUIZ (5 MARKS)		

External Evaluation (50 marks)

The evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

STRENGTH OF MATERIALS LAB

Third Semester

	L	T	P	C
Course Code: DME 351	**-**	**-**	**3**	**2**

1. Determination of shear force at different sections on a simply supported beam under points loads.

2. Determination of bending moment at different sections on a simply supported beam under different types of loading.

3. Determination of yield stress, ultimate stress, percentage elongation, plot the stress strain diagram and compute. the value of Young's Modulus of mild steel.

4. Determination of the maximum deflection and Young's Modulus. of elasticity by deflection apparatus.

5. Determination of modulus of rigidity of material by Torsion apparatus.

6. Determination of hardness of a metal plate by Rock Well Brinell hardness testing machine.

7. To perform impact test on Izod Impact testing machine.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (40 MARKS)			VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (25 MARKS)	ATTENDANCE (10 MARKS)	QUIZ (5 MARKS)		

External Evaluation (50 marks)

The evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

BUILDING CONSTRUCTION LAB

Third Semester

	L	T	P	C
Course Code: DCE 352	**-**	**-**	**3**	**2**

LIST OF PRACTICALS:

1. To conduct field tests of cement.
2. To determine normal consistency of cement.
3. To determine setting time (initial and final) of cement.
4. To determine fineness of given sample of cement.
5. To determine compressive strength of bricks.
6. To determine water absorption of bricks
7. determine soundness of cement.
8. To Layout of a building.
9. To construct brick bonds (English and Flemish bonds) in one, one and half and two brick thick (a) walls. L, T and cross junction. (b) Column.
10. Visit to construction site for showing the following item of works and to write specific report about the works seen.
    - **(a)** Timbering of excavated Trenching.
    - **(b)** Construction of Masonry Walls.
    - **(c)** Flooring: Laying of flooring on an already prepared lime concrete base.
    - **(d)** Plastering and Pointing of wall.
    - **(e)** White & colour washing.
    - **(f)** Use of Special type of shuttering/cranes/heavy machines in construction work.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (40 MARKS)			VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (25 MARKS)	ATTENDANCE (10 MARKS)	QUIZ (5 MARKS)		

External Evaluation (50 marks)

The evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

HYDRAULICS & HYDRAULIC MACHINES LAB

Third Semester

	L	T	P	C
Course Code: DME 352	**-**	**-**	**3**	**2**

(i) To verify Bernoullis Theorem.
(ii) To find out venturimeter coefficient.
(iii) To determine coef. of velocity (Cv), Coef. of discharge(Cd) Coef. of contraction (Cc) and verify the relation between them.
(iv) To perform Reynold's Experiment.
(v) To determine Darcy's coefficient of friction for flow through pipes.
(vi) To verify loss of head due to:
(a) Sudden enlargement
(b) Sudden Contraction.
(vii) Study of the following
(i) Reciprocating Pumps or Centrifugal Pumps.
(ii) Impulse turbine or Reaction turbine
(iii)Pressure Gauge /pitot tube.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (40 MARKS)			VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (25 MARKS)	ATTENDANCE (10 MARKS)	QUIZ (5 MARKS)		

External Evaluation (50 marks)

The evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

INDUSTRIAL EXPOSURE

	L	T	P	C
Course Code: DCE 355	**-**	**-**	**-**	**4**

Three Weeks structured and supervised, branch specific, task oriented industrial/field exposure to be organized during summer vacation.

The student during the vocational training must undertake training in at least any one of the following.

1. Topographical Map: survey work with the help of level & plane table and prepare the map showing contours.
2. **Construction of multistory framed structure:**
   The construction of different components of the framed structure foundation (pile, raft etc.) Beams, columns, slab. basement, ducts (lifts & services).
3. **Construction of Water Supply & Sewer Line:**
   The process of laying water supply and sewer pipe lines at a proper gradient and different method of pipe joints.
4. Construction of over Head Tanks; construction of different components of over head tank e.g. foundation, columns, beams, ring beams, side walls, circular slab etc.
5. Construction of Irrigation Work ; Construction of Irrigation channel at a proper gradient, Canal head works, Regulatory work, Falls, cross drainage work, Tube well Open well, wind mill etc.
6. **Construction of Dame:** Knowledge of the different works involved in construction of dams e.g mass concreting, concrete conveyors, tunneling etc.
7. **Construction of culverts & bridges:** The construction of piers, abutments, deep beam of bridge construction of different components of culvert eg. wing wall, abutments, curtain wall, slab and arch.
8. **Construction of Roads :** The construction of WBM. bituminous, Concrete roads and should know how to provide gradient .camber super elevation in construction of roads.
9. **Construction of Breast Wall & Retaining Wall :** The construction of breast wall & retaining wall of stones in construction of hill roads and provision of weep holes. Be must also understand the R.C.C. retaining wall its components eg. stem, heel and their reinforcement detail & construction.
10. **Entrepreneurial and professional Practice:** Student should go for training under the Private Architect/ Civil Engineering Consultant / Private Contractor/ Construction Agency and see the Civil Engineering Works performed by them.

The marking shall be as follows.

Internal: 50 marks
By the Faculty Guide - 25 marks
By Committee appointed by the Director – 25 marks

External: 50 marks
By Officer-in-charge trainee in industry – 25 marks
By External examiner appointed by the University – 25 marks

SOIL MECHANICS AND FOUNDATION ENGINEERING

Fourth Semester

	L	T	P	C
Course Code: DCE 401	**3**	**1**	**-**	**3**

Course Contents:

Unit I

Introduction:- Definition of soil Mechanics and foundation engineering. Soil formation – different kinds of soils and soil structures.

Fundamental definitions & their relationships:- Graphical representation of soil as a three phase system. Definitions of moisture content, unit weight of soil mass such as bulk density, saturated density, submerged density and dry density, specific gravity, mass specific gravity, void ratio, porosity and degree of saturation, percentage air voids and their content, density index. Relationships between various terms stated above. Consistency limits Liquid limit, Plastic limit, Shrinkage limit, Plasticity index, Consistency index. Grain size analysis - Sieve and Hydrometer analysis, C.C. and C.U. **(9 Lectures)**

Unit II

Classification of soils:- Particle size classification **–** M.I.T., and I.S., U.S. bureau of soils and U.S., P.R.A. Textural classification chart, brief description of plasticity chart. I.S. soil classification.

Permeability of soils:- Definition of permeability. Interpretation of Darcy's law, definition of discharge, velocity and seepage velocity and coefficient of percolation. Factors affecting permeability. Laboratory methods of falling head and constant head, field methods of pumping-out tests and pumping-in tests. **(9 Lectures)**

Unit III

Compaction:- Definition of Compaction. Standard & modified Procter compaction test. Different methods of compaction. Factors affecting compaction.

Brief description of field compaction methods. Compacting equipments and field control. Indian Standards.

Consolidation:- Definition of consolidation and its effect on foundation settlement. Difference between consolidation and compaction. **(12 Lectures)**

Unit IV

Shear strength:- Definition of shear strength. Definition of Cohesive (c) & non cohesive (Phy.) soil. Coulomb's equation. Shear box and unconfined compression tests.

Earth pressure and earth retaining structures :- Definition of earth pressure, active and passive earth pressures, terms and symbols relating to a retaining wall.

Relation between movement of wall and earth pressure. K_a and K_b by Rankin's Method. Simple earth pressure calculations without surcharge. **(12 Lectures)**

Unit V

Shallow and deep Foundation:- Definitions of shallow and deep foundations.

Types of shallow and deep foundations. Application of Terzaghi's bearing capacity formulae for different types of foundations. Factors affecting depth of shallow foundation. Classification of piles. Plate bearing tests for shallow foundations. **(9 Lectures)**

Project work

A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 – 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

Text Books:-

1. Sehgal S.B., *Soil Mechanics*, C.B.S. Publishers & Distributors Pvt. Ltd., New Delhi.
2. Dr. Alam Singh, *Basic Soil Mechanics & Foundations*, C.B.S. Publishers & Distributors, New Delhi.
3. Minocha & Diwedi, *Soil Mechanics*, B. Bharat Prakashan, Meerut.
4. Gadi S.K., *Soil Mechanics*, B.Tech Publichers, Lucknow.
5. Sharma S.K., *Soil Mechanics*, Aisan Publishers, Muzaffarnagar.

Reference Books:-

1. Punmia B.C., *Soil Mechanics & Foundation Engineering*, Laxmi Publication Pvt. Ltd., New Delhi.
2. Lambi, *Soil Mechanics*.

PUBLIC HEALTH ENGINEERING – I

Fourth Semester

	L	T	P	C
Course Code: DCE 402	**3**	**1**	**-**	**3**

Course Contents:

Unit I

(A) Water Supply Engineering

Introduction:- Necessity and brief description of water supply system. Water requirement: Per capita consumption for domestic, industrial, public and firefighting uses as per IS standards. Consumption, demand and its variation.

Sources of Water:- Surface water sources : Rivers, canal, impending reservoir and lakes, their quality of water and suitability. **(10 Lectures)**

Unit II

Water Treatment:- Suspended, colloidal and dissolved impurities. Physical, chemical and bacteriological tests and their significance. Minimum standards required for drinking water, Principles of Sedimentation, Coagulation, Flocculation, Filtration, Disinfection (Chlorination) including Jar Test, Break point chlorination, Residual chlorine. Flow diagram of different treatment units. Function, constructional details, working and operation of

(i) Aeration fountain **(ii)** Mixer **(iii)** Flocculate **(iv)** Clarifier **(v)** Slow and rapid sand filter **(vii)** Chlorination chamber **(viii)** Water softening **(ix)** Removal of Iron and Magnesia. Chemicals required for water treatment, their uses, and feeding devices. Simple design of sedimentation tank, and filters**.** **(10 Lectures)**

Unit III

Water Distribution

(i) Pipes:- Different types of Pipes:**-** Cast iron, steel, plastic, (PVC,LDPE,HDPE), asbestos cement, concrete, plastic, GI and lead pipes. Details of their sizes, joints and uses.

(ii) Appurtenances:- Sluice (Gate and spindle), air, reflux, scour and safety valves, fire hydrants, their working and uses.

(iii) Storage: Necessity, types of storing tanks: G.I. Sheet Tank, P.V.C. tank, over head tanks.

(10 Lectures)

Unit IV

Laying of Pipes: Setting out alignment of pipe line. Excavation in different types of soils and precautions taken. Precautions taken for traffic control, bedding for pipe line. handling, lowering, laying and jointing of pipes, testing of pipe lines and back filling. Use of boning rods.

(10 Lectures)

Unit V

Building Water Supply (i) General layout of water supply arrangement for a building (single and multistoried)as per IS Code of practice. Water supply fixtures and their installation. Tapping of water mains. **(ii)** Hot and Cold Water supply in buildings. Use of Solar water heaters. **(iii)** Rural water supply: Sources, treatment and distribution.

Maintenance:- Leakage detection and prevention. Replacement of damaged pipe. Maintenance of domestic plumbing fixtures. **(10 Lectures)**

Project work

A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the

faculty. The students will work in a group of 3 – 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

Text Books:-

1. Rangwala S.C*, Water Supply & Sanitary Engineering*, Charotar Publshing House (P) Ltd., Anand.
2. Gurcharan Singh*, Water Supply & Sanitary Engineering*, Standard Publishers Distributors, Delhi.
3. Garg S.K.*, Water Supply Engineering*, Khanna Publishers, Delhi.
4. Gupta D.V.*, Water Supply & Sanitary Engineering*, Asian Publishers, Muzaffarnagar.

Reference Books:-

1. Modi P.N.*, Water Supply Engineering*, Standard Book House, Delhi.

CONCRETE TECHNOLOGY

Fourth Semester

	L	T	P	C
Course Code: DCE 403	**3**	**1**	**-**	**3**

Course Contents:

Unit I

Introduction:- Definition of concrete. Brief introduction to properties of concrete. Advantages of concrete. Uses of concrete in comparison to other building materials.

Ingredients of Concrete: **(i) Cement:-** The chemical ingredients causing changes in properties, satuations of use and special precautions in use of the following types of cement: Ordinary Portland cement, rapid hardening cement, low heat cement, high alumina cement, blast furnace slag cement, quick setting, white and coloured cements. **(ii) Aggregates:-** Classification of aggregates according to source, size and shape. Characteristics of aggregates particle size and shape, surface texture; specific gravity of aggregate; bulk density, water absorption surface moisture, bulking of sand and deleterious materials in the aggregate. Grading of Aggregate:- Coarse aggregate, fine aggregate; All in-aggregate; fineness modulus; interpretation of grading charts and combination of two aggregates. **(iii) Water:-** Limits on the impurities as per ISI; affect of excessive impurities on concrete, Ascertaining the suitability of water with the help of concrete cube test. **(10 Lectures)**

Unit II

Water Cement Ratio:- Hydration of cement, Effect of various W/C ratios on the physical structure of hydrated cement, water cement ratio law and conditions under which the law is valid; internal moisture, temperature, age, and size of specimen. Definition of cube strength of concrete. Relations between water cement ratio and strength of concrete. Use of CBRI chart.

Workability: Definition, of workability. Concept of: Internal friction,, Segregation, Harshness. Factors affecting workability; water conent, shape, size and percentage of fineness passing 300 mic. Measurement of workability slump test, compaction factor test. Recommended slumps for placement in various conditions. Vee-Bee Consist meter. **(10 Lectures)**

Unit III

Proportioning for Ordinary Concrete: Object of mix design, Strength required for various grades as per IS 456, Preliminary test, Works cube test. Proportioning for ordinary mix as prescribed by IS and its interpretation. Adjustment on site

for: Bulking, water content, Absorption, Workability Design data for moisture, bulk age, absorption and suitable fine aggregate and coarse aggregate ratio. Difference between ordinary and controlled concrete.

Form Work: (i) Concept of factors affecting the design of form work (shuttering and staging) **(ii)** Materials used for form work. **(iii)** Sketches of form work for column, beams slabs. **(iv)** Stripping time for form work as per IS (No problems on the design of form work). **(v)** Removal of formwork. **(vi)** Precautions to be taken before, during and after RCC Construction. **(vii)** Special type of formwork. **(10 Lectures)**

Unit IV

Concrete Operations:- (i) Storing Cement:- (a) Storing of cement in the warehouse.**,** (b) Storing of cement at site., (c) Effect of storage on strength of cement.

Aggregate:- Storing of aggregate on site for maintaining uniformity of moisture and cleanliness.

(ii) Batching:- (a) Batching of cement.**,** (b) Batching of aggregate: Batching by volume, using gauge box, selection of proper gauge box, Batching by weight-spring balances and by batching machines.**,** (c) Measurement of water.
(iii) Mixing (a) Hand mixing **(b)** Machine mixing-types of mixer, capacities of mixers, choosing appropriate size of mixers, operation of mixers, mixing of water.
(c) Maintenance and care of machines.
(iv) Transportation of Concrete:- Transportation with and situations of use of the following- pans, wheel barrows, truck mixers, chutes, belt conveyors, pumps, tower cranes.
(v) Placement of Concrete:
(a) Prior preparation before placement; when put on natural soil, rocky base, specially prepared sub-base (brick soling and water bound macadam base), hardened concrete base, checking of form work, checking provision for joints. **(b)** Placement of concrete-precautions to be taken.
(vi) Compaction:
(a) Hand compaction-pavement, narrow and deep members. **(b)** Machine compaction-types of vibrators (internal screed vibrators and form vibrators) Method of handling screed vibrations and immersion vibrations. Suitability of concrete mixes for compaction with vibrators. Selection of suitable vibrators for various situations.
(vii) Finishing concrete slabs-screeding, floating, and trowelling.
(viii) Curing:- Object of curing, Method of curing, shading concrete works, covering surfaces with hesian, gunny bags, sprinkling of water, ponding method and membrane curing, steam curing. Recommended duration for curing.
(ix) Jointing:- Location of construction joints, treatment of construction joint before the concrete is poured, concreting at these joints. Expansion joints in concrete in buildings-their importance and location. **(10 Lectures)**

Unit V
Properties of Concrete: (i) Properties in plastic stage:- (a) Workability, (b) Segregation., (c) Bleeding. **(ii) Properties of hardened concrete:-** (a) Strength. Characteristic strength**,** (b) Durability**,** (c) Impermeability.**,** (d) Dimensional changes. **(iii) Admixture (uses and effect):-** (a) Accelerators and retarders.**,** (b) Air entraining agents.**,** (c) Water reducing and set controlling agents.
Quality Control at site:- Control tests on cement, aggregate water and concrete. Concept of quality control.
Hot Weather Concreting:- Effect of high temperature on concrete strength with reference to mass concreting, cooling of concrete materials, precautions before, during and after concreting, Use of retarders.
Cold Weather Concreting:- Effect of low temperature on concrete strength, Heating of concrete materials. Precaution before, during and after concreting. Use of accelerators.
Repair and Maintenance:- Method of repairing by grouting new and old concrete work for cracks and holes. Repairs under water.
Special types of concrete:- General idea of special types of concrete , High strength concrete, fiber reinforced concrete, polymer concrete, fibrocement concrete. readymix concrete.
(10 Lectures)

Project work
A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 – 5 on each topic. The topic should be related to

the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

Text Books:-

1. Neville A.M., *Concrete Technology*, Standard Publishers Distributors, Delhi.
2. Kulkarni P.D., *Textbook of Concrete Technology*, New Age International Publishers, Delhi.
3. Santhakumar A.R., *Concrete Technology*, Oxford University Press, Mumbai.

Reference Books:-

1. Ramachandran V.S., *Concrete Admixtures Handbook*, Standard Publishers Distributors, Delhi.

IRRIGATION ENGINEERING

Fourth Semester

	L	T	P	C
Course Code: DCE 404	**3**	**1**	**-**	**3**

Course Contents:

Unit I

Introduction: Definition of irrigation. Necessity of irrigation, History of development of irrigation in India, Types of irrigation, Sources of irrigation water.

2. Rain Fall & Run – Off: Definition of rainfall & run-off, catchment area, Dickens's & Ryve's formulae, Types of rain gauges - Automatic & Non – automatic, Stream gauging.

Water Requirement of Crops:- Definition of crop season, Duty, Delta and Base Period, their relationship, Gross command area, culturable command area Intensity of Irrigation, Irrigable area Water requirement of different crops-Kharif and Rabi. **(10 Lectures)**

Unit II

Lift Irrigation:- Types of Wells - shallow & deep well, aquifer types, ground water flow, construction of open wells and tube wells. Yield of an open/tube well and problems Methods of lifting water - manual and mechanical devices, use of wind mills.

Flow Irrigation:- Irrigation canals, Perennial Irrigation, Different Parts of irrigation canals and their functions, Sketches of different canal cross-sections, Classification of canals according to their alignment, Design of irrigation canals – Chezy's formula, Manning's formula, Kennedy's and Lacey's silt theory and equations, comparison of above, two silt theory's. equations, critical velocity ratio. Use of Garret's and Lacey's charts, Various types of canal lining - Advantages & Disadvantages. **(10 Lectures)**

Unit III

Canal Head Works:- Definition, object, general layout, functions of different parts, Difference between Weir and Barrage.

7. Regulatory Works:- Functions and explanation of terms used, Cross and Head regulators, Falls, Energy dissipaters, Outlets-Different types, Escapes. **(10 Lectures)**

Unit IV

Cross Drainage Works:- Functions and necessity of the following types:- Aqueduct, Siphon, Super passage, Level crossing, inlet and outlet., Constructional details of the above.

Dams:- Earthen dams-types, causes of failure, Classification into masonry & concrete dams, Labeled cross-section of gravity dam., Spillways. **(10 Lectures)**

Unit V

Water Logging and Drainage:- Definition, causes and effects, detection, prevention and remedies Surface and sub-surface drains and their layout.

Major Irrigation Projects in India **(8 Lectures)**

Practice:

Visits to at least one of the Irrigation Projects and write specific report about the same. Ground Water Recharge, Aim, Method and Advantage.

Project work

A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 – 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

Text Books:-

1. Agarwal G.D., *Irrigation Engineering*, B. Bharti Prakashan, Merrut.
2. Modi P.N., *Irrigation Engineering*, Standard Book House, Delhi.

Reference Books:-

1. Dr. Bharat Singh, *Irrigation Engineering*, Nem Chand & Bros., Roorkee.

BUILDING CONSTRUCTION – II

Fourth Semester

	L	T	P	C
Course Code: DCE 405	**3**	**1**	**-**	**3**

Course Contents:

Unit I

Damp Proofing

Dampness and its ill effects on bricks. Plaster, wooden fixtures, metal fixtures and reinforcement, damage to aesthetic appearance. Damage to heat insulating materials, Damage to stored articles and health. Types of dampness – moisture penetrating the building from outside e.g. rainwater, surface water, ground moisture. Moisture entrapped during construction i.e. moisture in concrete, masonry construction and plastering work etc. Moisture which originates in the building itself i.e. water in kitchen and bath rooms etc. Damp proofing materials and their specifications rich concrete and mortar, bitumen, bitumen mastic. Methods of damp proofing basement, ground floors, plinth and walls, special damp proofing arrangements in bathrooms, W.C. and Kitchen, Damp Proofing for roofs and window sills. Plinth Protection and Aprons. **(10 Lectures)**

Unit II

Floors

Ground floors:

(a) Glossary of terms – floor finish, topping, under layer, base course, rubble filling and their purpose.

(b) Types of floor finishes – cast in situ concrete flooring (monolithic, bonded) Terrazzo tile flooring. Terrazzo flooring, Timber flooring. Description with sketches of the methods of construction of the floors and their specifications. Floor polishing equipment.

Upper floors:

(a) Flooring on RCC Slab

(b) Flooring on R.B. Slab. **(10 Lectures)**

Unit III

Roofs: Glossary of terms for pitched roofs – batten, eaves board, facial board, gable hip, lap, purlin, rafter, rag bolt, valley, ridge. Pitched roof, steel trusses, fink truss, arched trusses, North light truss. Roof coverings for pitched roofs – Asbestos sheeting, big six, Trafford sheets, Mangalore tiles, method of arranging and fixing to the battens, rafters, purlins – both steel and wooden. Drainage arrangement for pitched roofs. Drainage arrangements for flat roofs.

(10 Lectures)

Unit IV

Stairs and Staircase:- (i) Glossary of terms: Stair case winders landing, strings, newel, baluster, riser, tread, width of staircase, hand rail, nosing.**(ii)** Planning and layout staircase: Relations between rise and tread, determination of width of stair, landing etc. Various types of layout – straight flight, dog legged, open well, quarter turn, half turn, (Newel and geometrical staircase). Bifurcated stair, spiral stair. **(10 Lectures)**

Unit V

Surface Finishes: Plastering – Classification according to use and finishes like grit finish, rough cast, pebble dashed, plain plaster etc. Dubbing, Proportion of mortars used for different plasters, preparation of mortars, techniques of plastering and curing. Pointing – Different types of pointing, mortar used and method of pointing.

Painting – preparation and application of paints on wooden, steel and plastered wall surfaces. White washing, colour washing and distempering. Application of cement and plastic paints. Commonly used water repellants for exterior surfaces, their names and application.

(10 Lectures)

Project work

A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 – 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

Text Books:-

a. Kumar Susheel, *Building Construction*, Standard Publishers Distributers, Delhi.

b. Singh Gurcharn, *Building Construction*, Standard Publishers, Delhi.

c. Gupta D.V., *Building Construction*, Asian Publishers, Muzaffarnagar.

Reference Books:-

1. Punmia B.C., *Building Construction*.

Technical Communication
Fourth Semester

Course Code: DIP 401

L	T	P	C
2	0	2	3

Course Content:

Unit I

Pre-requisites of Technical Written Communication: One Word Substitution, Spelling process, words often confused and misused, Technical terms. **(8 hours)**

Practical (oral):

To make students practice the above mentioned topics & take care of the technical terms & also use those in different sentences. **(2 hours)**

Unit II

Technical Communication: Nature, origin & development, salient features, significance, Difference between Technical Communication & General Writing. **(8 hours)**

Practical (oral) : To make students speak on the development of Technical Communication. **(2 hours)**

Unit III

Forms of Technical Communication: What is a Report ? Characterstics of Report, steps to be followed for Report writing, Structure of Report, Importance of Report Writing. **(8 hours)**

Practical (oral): To make students practice how to write a report and then speak on the subject matter of the report. **(2 hours)**

Unit IV

Technical Proposal: What is Proposal ? Significance of proposal, format of proposal, characteristics' of a good proposal. **(8 hours)**

Practical (oral): To make students practice writing a proposal. **(2 hours)**

Recommended Books:

1. Raman Meenakshi & Sharma Sangeeta – Technical Communication – Principles & Practices, - ONP, N. Delhi
2. Mohan K. & Sharma R – Business Correspondence & Report Writing – TMH N.Delhi.

NOTE:

This syllabus has been designed to improve the oral and written communication skills of students. The faculty members should put emphasis on practical (oral) activities for generating students' interest in language learning.

*** Latest editions of all the suggested books are recommended.**

SOIL MECHANICS AND FOUNDATION ENGINEERING LAB

Fourth Semester

	L	T	P	C
Course Code: DCE 451	**-**	**-**	**3**	**2**

1. Determination of moisture content by oven drying method.
2. Determination of specific gravity of soil particles by specific gravity bottle/pycnometer.
3. Determination of soil particles size distribution by sieving.
4. Determination of liquid limit and plastic limit of soil.
5. Determination of permeability by constant Head Permeameter and falling head permeameter.
6. Shear strength of clean sand by Shear Box text.
7. Unconfined compression test.
8. Standard Proctor compaction text.
9. Determination of field density of soil by sand replacement and cutter methods.
10. Determination of Standard Penetration Test.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (40 MARKS)			VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (25 MARKS)	ATTENDANCE (10 MARKS)	QUIZ (5 MARKS)		

External Evaluation (50 marks)

The evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

PUBLIC HEALTH ENGINEERING LAB

Fourth Semester

	L	T	P	C
Course Code: DCE 452	**-**	**-**	**3**	**2**

1. To determine dissolved and suspended solids in water.
2. To determine pH value of water sample.
3. To determine turbidity of water.
4. To calculate:
- **i.** Oxygen Demand (OD)
- **ii.** Biological Oxygen Demand (BOD)
- **iii.** Chemical Oxygen Demand (COD)

5. To determine residual chlorine in water sample.
6. To perform Jar Test for Coagulants.
7. To collect samples of water from shallow & deep wells.
8. To perform chlorine demand test.
9. To determine hardness of water.
10. To determine available chlorine in bleaching powder.
11. To perform field test for the detection of intermediate pollution in drinking water by OT test.
12. To visit and write specific report for the following: (Any three)

a. Water treatment plant for moderate town (say Population 1 lacs) **b.** Sewage treatment plant for 5 lac to 10 lac population **c.** Sewage disposal work**. d.** Construction site for layout of water supply & sewerage system. **e.** Industrial effluent treatment plant

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (40 MARKS)			VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (25 MARKS)	ATTENDANCE (10 MARKS)	QUIZ (5 MARKS)		

External Evaluation (50 marks)

The evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

CONCRETE TECHNOLOGY LAB

Fourth Semester

	L	T	P	C
Course Code: DCE 453	**-**	**-**	**3**	**2**

(i) To determine flakiness index and elongation index of coarse aggregate (ISI:2386-pt.1-1963)
(ii) Field method to determine fine silt in aggregate.
(iii) Determination of specific gravity and water absorption of aggregates (IS:2386 Part-III-1963) (for aggregates 40mm to 10mm)
(iv) Determination of bulk density and voids of aggregates (IS:2386-Part-III-1963)
(v) Determination of surface moisture in fine aggregate by displacement method (IS:2383-Part-III-1963)
(vi) To determine necessary adjustment for bulking of fine aggregate by field method (IS:2383-Part-III-1983).
(vii) Test for workability (slump test);
(a) To verify the effect of water, fine aggregate/coarse aggregate ratio and aggregate/cement ratio on slump.
(b) To test cube strength of concrete with varying water cement ratio.
(viii) Compacting factor test for workability (IS:1199-1959)
(ix) Workability of concrete by Vee-Bee consist meter.
(x) Fineness modulus of sand.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (40 MARKS)			VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (25 MARKS)	ATTENDANCE (10 MARKS)	QUIZ (5 MARKS)		

External Evaluation (50 marks)

The evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

CIVIL ENGINEERING DRAWING-I
Fourth Semester

	L	T	P	C
Course Code: DCE 454	**2**	**-**	**6**	**5**

1. Symbols and conventions of materials & fittings in Civil Engineering. **1-1x4**

2. Symbols & conventions of electrical fittings. **1-1x4**

3. Foundations. **1-1x4**

4. Doors & windows. **2-4x4**

5. Roofs: Wooden roof truss details. Section of RCC & RB flat roofs. **2-4x4**

6. Floors. **1-1x4**

(a) Concrete floor finish over ground floor.
(b) Terrazzo floor finish over ground floor.
(c) Concrete floor finish with structured slab.
(d) Terrazzo floor finish structured slab.
(e) Terrazzo tile floor finish over ground.

7. Working drawing of a two roomed building with kitchen and bath having pitched roof. **1-1x4**

8. Working drawing of a three roomed building from a given line plan and given data. **1-1x4**

9. Working drawing of a three bed room double storied flat roofed residential building. **1-1x4**

10. Stair case **1-1x4**

a. Details of dog legged stairs (Wooden & RCC).
b. Plans of remaining type of stairs.

11. **a.** Detailed plan and section of an inspection chamber and manhole. **1-1x4**

b. Detailed plan and cross section of a domestic septic and soak pit for 10 users as per IS:2470 Part I.

12. Detailed plan and cross section of bathroom, kitchen and W.C. connections. **1-1x4**

13. Detailed drawing of pipe joints commonly used in water supply and sewerage system. **1-1x4**

14. Two Room building working drawing with AutoCAD. **1-1x4**

15. Three Room building working drawing with AutoCAD. **1-1x4**

(Plate No. 14 & 15 should be prepared by AutoCAD also) **1-1x4**

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (40 MARKS)			VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (25 MARKS)	ATTENDANCE (10 MARKS)	QUIZ (5 MARKS)		

External Evaluation (50 marks)

The evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

Text Books:-

1. Civil Engineering Drawing by Gurcharan Singh, Standard Publishers Distributors, Delhi.
2. Civil Engineering Drawing by M. Chakarwarti.

TRANSPORTATION ENGINEERING – I

Fifth Semester

	L	T	P	C
Course Code: DCE 501	**3**	**-**	**-**	**3**

Course Contents:

Unit I

HIGHWAYS

Introduction: **(i)** Importance of Highway transportation. **(ii)** Functions of IRC. **(iii)** IRC classification of roads. **(iv)** Organization of state highways department.

Road Geometrics: **(i)** Glossary of terms used in geometrics and their importance; Right of way, formation width, road margin, road shoulder, carriage way, side slopes, kerbs, formation levels, camber and gradient. **(ii)** Design and average running speed, stopping and passing sight distances. **(iii)** Curves necessity, horizontal and vertical curves including transition curves and super elevation, Methods of providing super elevation. **(iv)** Use of IRC design tables and specifications for finding elements of Road geometrics. Drawing of typical cross-sections in cutting and filling on straight and at a curve. **(v)** Under pass & over pass (flyovers and bridges) Highway Surveys and Plans.

(i) Basic considerations governing alignment for a road in plain and hilly area.

(ii) Highway location. **(10 Lectures)**

Unit II

Marking of alignment.

Importance of various stages viz: **(a)**Reconnaissance survey: Conduct reconnaissance and prepare reconnaissance report. **(b)** Preliminary survey: Object, organizing, conducting and information's to be collected. **(c)** Location survey. **(d)** Standards for preparing the highway plans as per Ministry of Transport.

Traffic Engineering: **(i)** Traffic studies , Methods of collection and presentation of volume count data. **(ii)** Traffic control devices - Signs, markings and signals, their effectiveness and location, installation of signs, IRC standards. **(iii)** Segregation of traffic. **(iv)** Types of intersections and how to choose them. **(v)** Accidents: Types, causes and remedies.

Road Materials: **(i)** Different types of road materials in use; soil, aggregates binders. **(ii)** Function of soil as Highway sub grade. **(iii)** C.B.R; Method of finding. CBR value and its significance. **(iv)** Testing aggregates : Abrasion test, impact test, crushing strength test, water absorption test and soundness test. **(v)** Aggregates : Availability of road aggregates in India, requirements of road aggregates as per IS specifications. **(vi)** Binders: Common binders; cement, bitumen and Tar, properties as per IS specifications, penetration and viscosity test , procedures and significance. cut back and emulsion and their uses. **(10 Lectures)**

Unit III

Road Pavements ; Types and Their Construction: **(i)** Road pavement : Flexible and rigid pavement, their merits and demerits, typical cross-sections , functions of various components. **(ii)**Sub-grade preparation - Setting out alignment of road, setting out bench marks, control pegs for embankment and cutting, borrow pits, making profiles of embankment, construction of embankment, compaction, stabilization, preparation of sub grade. methods of checking camber, gradient and alignment as per recommendations of IRC, equipment used for sub grade preparation. **(iii)** Flexible pavements: sub base necessity and purpose. stabilized sub base; purpose of stabilization.

Types of Stabilization: **(a)** Mechanical stabilization. **(b)** Lime stabilization. **(c)** Cement stabilization. **(d)** Fly ash stabilization. **(e)** Granular sub base

(iv) Base course: (a) Brick soling. **(b)** Stone soling. **(c)** Medaling: water bound macadam and bituminous macadam. Methods of construction as per Ministry of Shipping and transport (Government of India).

(v) Surfacing:

Types of surfacing:(a) Surface dressing. **(b) (i)** Premix carpet. **(ii)** Semi dense carpet (S.D.C) **(c)** Asphalt concrete. **(d)** Grouting.

Methods of constructions as per Ministry of Surface and Transport, Government of India, specifications and quality control; equipment used.

(vi) Rigid pavements: Construction of concrete roads as per IRC specifications:

Form laying, mixing and placing the concrete, compacting and finishing, curing, joints in concrete pavement, equipment used. **(10 Lectures)**

Unit IV

Hill Roads: (i) Introduction: Typical cross-sections showing all details of a typical hill road in cut, partly in cut and partly in fill.

(ii)Landslides : Causes, preventions and control measures.

Road Drainage: (i) Necessity of road drainage work, cross drainage works. **(ii)**Surface and subsurface drains and storm water drains. Location, spacing and typical details of side drains, side ditches for surface drainage. Intercepting drains, pipe drains in hill roads, details of drains in cutting embankment, typical cross-sections.

Road maintenance: (i) Common types of road failures-their causes and remedies such as baggie action. **(ii)**Maintenance of bituminous roads such as patch work and resurfacing. Maintenance of concrete roads-filling cracks, repairing joints, maintenance of shoulders (bergs),maintenance of traffic control devices. **(10 Lectures)**

Unit V

Construction Equipment: Output and use of the following plant and equipments:

(i) Hot Mix Plant & Mix all battery. **(ii)**Tipper, tractors (wheel and crawler) scraper, bull-dozer, dumpers, shovels, grader, roller, dragline. **(iii)**Asphalt mixer and tar boilers. **(iv)**Road pavers.

Arboriculture: Names of trees used in arboriculture, distance of trees from centre of roads and distance between centre to centre of trees, tree guards, maintenance and revenue from trees.

(10 Lectures)

Project work

A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 – 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

Text Books:-

1. Gupta B.L., *Road, Railway, Bridges, Tunnels& Harbour Dock Engineering*, Standard Publishers Distributors, Delhi.
2. Rangwala S.C., *Highway Engineering*, Charotar Publshing House (P) Ltd., Anand.
3. Ahuja & Birdi, *Road, Railway, Bridges & tunnels Engineering*, Standard Books House, Delhi.

Reference Books:-

1. Khana S.K. & Justo, *Highway Engineering*, Nem Chand & Bros., Roorkee.

SURVEYING – II

Fifth Semester

	L	T	P	C
Course Code: DCE 502	**3**	**-**	**-**	**3**

Course Contents:

Unit I

Plane Table surveying

(i) Purpose of plane table surveying. Equipment used in plane table survey
(a) Plane table, **(b)** Alidade (Plain and Telescopic),**(c)** accessories.

(ii) Method of plane tabling **(a)** centering **(b)** leveling **(c)** Orientation.

(iii) Methods of plane table surveying (a) Radiation, (b) Intersection, (c) Traversing (d) Resection.

(iv) Two point problem.

(v) Three point problem by
(a) Mechanical Method (Tracing paper), **(b)** Bessel's Graphical Method.
(c) Trial and error method.

Errors in plane table survey and precautions to control them. Testing and adjustment of plane table and alidade. **(12 Lectures)**

Unit II

Contouring: Concept of contour: Purpose of contouring; Contour interval and horizontal equivalent; Factors affecting contour interval; characteristics of contour; Methods of contouring direct and indirect, use of stadia measurements in contour survey. Interpolation of contours; Use of contour map; Drawing cross section from a contour map; Marking alignment of a road, railway and a canal on a contour map; Computation of earthwork and reservoir capacity from a contour map. **(8 Lectures)**

Unit III

Theodolite Surveying: Working of a transit venire theodolite, Fundamental axes of a theodolite and their relation; Temporary adjustments of a transit theodolite; least count and concept of transiting, swinging, face left, face right and changing face; Measurement of horizontal and vertical angles. Prolonging a line(forward and backward) Measurement of bearing of a line; Traversing by included angles and deflection angle method; traversing by stadia measurement; Theodolite triangulation and plotting a traverse; concept of coordinate and solution of omitted measurements (one side affected); Errors in theodolite survey and precautions taken to minimize them; Limits of precision in theodolite traversing. Principle and working of a micro-optic theodolite. Brief introduction to tachometry.

Total Station & Auto Level : Working and application of total station and auto level.

(12 Lectures)

Unit IV

5. Curves: Simple circular curves: Need and definition of a simple circular curve; Elements of simple circular curve, Degree of the curve, radius of the curve, tangent length, point of intersection (Apex point), tangent point, length of curve, long chord, deflection angle, apex distance and mid-ordinate. Setting out of simple circular curve: **(a)** By linear measurements only: **-** Offsets from the tangents. **-** Successive bisection of arcs. **-** Offsets from the chord produced. **(b)** By Tangential angles using a theodolite. **(8 Lectures)**

Unit V

Transition Curves: Need (centrifugal force and super elevation) and definition of transition curve; requirements of transition curves; length of transition curves for roads by cubic parabola; calculation of offsets for a transition curve; setting out of a transition curve by tangential offsets only. **Vertical curves:** Setting out of a vertical curve. **(8 Lectures)**

Project work

A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 – 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

Text Books:-

1. Arora K.R., *Surveying Vol. I & II*, Standard Book House, Delhi.
2. Kanetkar T.P., *Surveying & Levelling Vol. I & II*, Pune Vidyarthi Griha Prakashan, Pune.
3. Basak P.N., *Surveying & Leveling*, Tata Mc Graw – Hill Publishing Co. Ltd., Delhi.
4. Agarwal G.D., *Surveying Vol. I & II*, Unitech Publishers, Lucknow.
5. Dass G., *Surveying Vol. I & II*, Nav Bharat Prakashan, Meerut.

Reference Books:-

1. Punmia B.C., *Surveying Vol. I & II*, Laxmi Publications (P) Ltd. New Delhi.
2. Guggal S.K., *Surveying Vol. I & II*, New Age International Publishers New Delhi.
3. Chandra A.M., *Surveying Problem Solving with Theory & Objective Type Questions*, New Age International Publishers New Delhi.

CONSTRUCTION MANAGEMENT & ACCOUNTS

Fifth Semester

	L	T	P	C
Course Code: DCE503	**3**	**1**	**-**	**3**

Course Contents:

Unit I

CONSTRUCTION MANAGEMENT

Introduction: (i) Classification of construction into light, heavy and industrial construction. **(ii)** Stages in construction from conception to realization. **(iii)** The construction team: Owner, engineer and contractors, their functions and interrelationship. **(iv)** Resources for construction industry; men, machines, materials, money and management. **(v)** Main objectives of Civil engineering management. **(vi)** Functions of construction management, planning, organizing, staffing, directing, controlling and co-ordination, meaning of each of these with respect to a construction job.

Construction Planning: (i) Stages at which planning is done. Pre tender and contract planning by the contractor. **(ii)** Scheduling: Definition, Methods of scheduling: bar charts and CPM, advantages of scheduling. No problem on CPM to be set in the examination. **(iii)** Planning and scheduling of construction jobs by bar charts. **(iv)** Preparation of construction schedule, labour schedule, material schedule, and equipment schedule. **(v)** Limitations of bar charts. **(vi)** Cost-time balancing.

Organization: (i) Types of organization: Line, staff, functional and their characteristics. **(ii)** Principles of organization; (only meanings of the following and their significance);Span of control ; Delegation of authority and responsibility; Ultimate authority and responsibility; Unity of command; contact; unity of assignment; job definition; increasing organization relationship. **(iii)** Motivation and human relationship concept, need and fundamentals. **(12 Lectures)**

Unit II

Site Organization: (i) Factors influencing, job layout from site plan. **(ii)** Principle of storing and stacking materials at site. **(iii)** Location of equipment. **(iv)** Preparation of actual job layout for a builidng. **(v)** Organizing labour at site.

Construction Lab our: (i) Conditions of construction workers in India, wages paid to workers. **(ii)** Trade unions connected with construction industry and trade Union Act. **(iii)** Lab our welfare. **(iv)** Payment of wages Act. Minimum wages Act. **(v)** Workmen compensation Act. **(vi)** Contract Lab our Act.

Control of Progress: (i) Methods of recording progress. **(ii)** Analysis of progress.
(iii) Taking corrective actions keeping head of office informed. **(12 Lectures)**

Unit III

Inspection and Quality Control:-(i) Principles of inspection. **(ii)** Major items in construction job requiring quality control.

Accidents and Safety in Construction: (i) Accidents - causes. **(ii)** Safety measures for: - **(a)** Excavation work **(b)** Drilling and blasting. **(c)** Hot bituminous works. **(d)** Scaffolding, ladders, form work. **(e)** Demolitions. **(iii)** Safety campaign. Professional practice. **(12 Lectures)**

Unit IV

ACCOUNTS

Introduction: (i) Necessity of account. **(ii)** List of reference book on accounts:

(a) Civil Services Rules, Vol, I, II and III **(b)** PWD Accounts codes. **(c)** Manual of orders. **(d)** Departmental financial rules. **(e)** State Treasury rules.
Organization:- (i) Establishments in the PWD. **(ii)** Regular establishment:
(a) Permanent establishment. **(b)** Temporary establishment.
(iii) Work charged establishment. **(iv)** Contingency establishment.
Outline of P.W.D. System of Accounts: (i) Necessity of a system of accounts. **(ii)** P.W.D. system of accounts. **(iii)**Classification of transactions: **(a)** Necessity of maintaining the accounts by Head of Accounts: **(b)** Heads of Account: - Major Heads. - Minor Heads. - Detailed Heads. (Detailed Heads of Accounts not to be memorized).
Cash:- (i) Definition of cash. **(ii)** Precautions in custody of cash. **(iii)** Treasury challis-procedure to fill the prescribed form. **(iv)** Imp rest account and temporary advance. **(v)** Definition of imp rest and rules for maintaining imp rest account. Actual filling of the prescribed form. **(vi)** Definition of temporary advance; its difference from the imp rest account; maintenance of temporary advance account. **(12 Lectures)**

Unit:- V
Stores: (i) What are stores, their necessity and safe custody. **(ii)** Classification of Stores: **(a)** Stores debatable to suspense heads-stock. **(b)** Stores debatable to final heads: Tools and plant. Road metal Material charged direct to works. **(iii) Stock:- (a)** Kind of articles in stock; **(b)** Sources of stock receipt; Suppliers. Other departments, divisions and sub-divisions. Manufacturers. Works, **(c)** Sub heads of stock. **(d)** Quantity accounts of stock. Rules for preparing indent and invoices; preparation of indent in proper form. Register of stock receipts and issues, procedure for recording entries in proper form. Actual filling of the form. **(e)** Return of monthly transaction of stock and half yearly return of stock. **(f)** Stock taking of stores-general rules. **(g)** Surpluses and shortages of stock-action for rectification of mistakes in stock accounts.**(h)** Losses of stock-reporting the loss, estimates for loss of stock and writing off. **(iv) Tools and Plants (T&P)**:- **(a)** Meaning. **(b)** Classification of T&P - Register of T&P receipts and issues-Rules for actual filling of the prescribed form. - Statement of receipts and issues of T&P in prescribed form. **(c)** Sources of receipt of T&P **(d)** Authority of issue of T&P. **(e)** Surpluses and shortage of T&P-reconciliation of accounts. **(f)** Points of difference in accounts of stock and T&P. **(g)** Disposal of unserviceable articles of T&P. Preparation of survey report in prescribed form.**(v) Road Metal:- (a)** Meaning. **(b)** Rules for maintaining road metal returns filling up the prescribed form. **(c)** Method of checking. **(d)** Shortages and surpluses. **(vi)**Materials charged direct to works:- Necessity, circumstance under which materials are directly charged to work.**(a)** Material at site Accounts (M.A.S), Rules for actual filling of prescribed form i.e. - Detailed statement of materials compared with estimated requirements and - Report of the value and verification of unused materials. **(b)** Disposal of surplus materials at the work site. **(c)** Definition of: - Issue rate - Storage rate. - Storage charges. - Supervision charges - Assets and liabilities. **(viii) Issue of materials to contractors.**
Works: (i) Categories:- **(a)** Original works. **(b)** Repair works. **(ii)** Classification of works according to cost:- **(a)** Major works. **(b)** Minor works. **(c)** Petty works.
(iii) Conditions to be fulfilled before a work can be taken in hand: **(a)** Administrative approval. **(b)** Technical sanction. **(c)** Appropriation of funds.
(d) Expenditure sanction (for plan works) **(iv)** Methods of carrying out works:- **(a)** Departmentally through daily lab our **(b)** Through contractors - Piece work system - work order - Contract system - Agreement. **(v)** Different types of contract: **(a)** Item rate contract. - Labour rate (%age above or below)for various items or for covered areas construction (Private construction only) - Through rate basis (%age above or below) **(b)** Lump-sum contract. **(vi)** Allotment of

works: **(a)** Concept of quotations and tenders **(b)** Work order - Rules and Form. **(vii)** Definition of deposit works and Taccavi works.

Payment for Works:- (i) Daily labour: **(a)** Meaning. **(b)** Muster roll**,** Rules. Instruction for maintenance. Three parts of M.R. - Nominal roll, unpaid wages, detail of work done and filling of prescribed form. **(c)** Daily lab our report, filling of prescribed form. **(d)** Casual lab our-Rolls Its difference from M.R. **(e)** Mistakes of common occurrence. **(ii)** Payment of work charged establishment preparation of pay bill on prescribed form. **(iii)** Payment to contractors and suppliers: **(a)** Record of measurement. Measurement book (M.B.) General Instructions. Methods of payment after measurements are recorded in M.B. Common mistakes in the use and maintenance of M.B. Student may be directed to record the measurement of different item such as W/w, Distemper, Painting, Glass fitting, Plastering, etc. for maintenance of a building. **(b)** Check measurement Book (C.M.B.) Purpose, administration with regard to its maintenance. **(c)** Standard measurement book (SMB) Purpose and instruction with regard to its maintenance. **(iv)** Different types of payment **(a)** First and final payment. **(b)** Running payment., Secured advance. On account payment. Advance payment. Running and final payment. **(v)** Hand receipt. **(vi)** Clause in which the detailed measurements are dispensed with.

Miscellaneous:- (i) Duties of Junior Engineer/S.O. and S.D.O. **(ii)** Instructions on transfer of charge. **(iii)** Maintenance of log books of vehicles and machinery. **(iv)** Manufacturers accounts and out turn of machinery. **(v)** Dealing with railways-booking of consignment, taking delivery, credi**t** note, demurrage and wharf age charges and damaged consignment.

NOTE: Students will not be required to draw out and memorize the forms. They are expected to know only how to fill up the forms supplied for the purpose from the given data.

(12 Lectures)

Project work

A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 – 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

Text Books:-

1. Sadimala C.M., *Materials and Financial Management*, New Age International Publishers, Delhi.

Reference Books:-

1. Gahlot P.S., *Construction Planning and Management*, International Publishers, Delhi.

ENVIRONMENTAL POLLUTION & CONTROL

Fifth Semester

	L	T	P	C
Course Code: DCE 504	**3**	**-**	**-**	**3**

Course Contents:

Unit:- I

ECOLOGY OF ENVIRONMENT:- Elements of environment: Earth, water, air, space and energy. Ecology: Living and non living concept leading to ecology. Ecosystem: Terrestrial, aquatic and marine affect of environmental pollution on ecological balances.

POLLUTION AND ITS CLASSIFICATIONS:- Definition, classification, air, water, solid waste, thermal , noise and radioactive pollutions. Different parameter of pollution. **(10 Lectures)**

Unit:- II

WATER POLLUTION:- Sources , transport of pollutants, effect of water pollutants on man, animal ,plant and material, various types of pollutants. Mainly discuss various types of wastes from community, general characteristics of domestic & industrial wastes and their affects on environment, disposal methods on land and water, criteria of disposal by dilution. Stream sanitation. Sampling and monitoring instrumentation for water pollution and control.

(10 Lectures)

Unit:- III

AIR POLLUTION:- Sources, types of air pollutants, Transport of air pollutants, dispersion by single and multiple sources. Control equipment, filter, electrostatic precipitators, wet scrubbers, fume combustion by incineration. Air pollution control in new and old plants. **(10 Lectures)**

Unit:- IV

SOLID WASTE POLLUTION:- Review of various types of solid waste. sources, components of solid waste, city garbage and industrial solid waste handling and disposal equipment . Method of disposal, salvage and recovery. Volume reduction in solid waste.

NOISE POLLUTION:- Sources, measurement of pollution. Degree of noise. Echos and their control. Industrial noise, units characteristics occupational injuries due to noise, criteria and standard for occupational injuries due to noise. Means to control noise in industry. **(10 Lectures)**

Unit:- V

THERMAL POLLUTION:- Various pollutants. Affects on environment, preventive measures.

RADIO ACTIVE POLLUTION:- Sources and affect on human, animals, plants and materials, measurement, means to control, preventive measures. **(10 Lectures)**

Project work

A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 – 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

Text Books:-

1. Gaur R.C., *Basic Environmental Engineering*, New Age International Publishers, Delhi.
2. Anil Kumar De, *Environmental Education*, New Age International Publishers, Delhi.

Reference Books:-

1. Khopkar S.M., *Environmental Pollution Monitoring and Control*, New Age International Publishers, Delhi.
2. Srivastava Smriti, *Environment and Ecology*, S.K. Kataria & Sons, Delhi.

PUBLIC HEALTH ENGINEERING – II

Fifth Semester

	L	T	P	C
Course Code: DCE 505	**3**	**-**	**-**	**3**

Course Contents:

Unit:- I

(B) SANITARY ENGINEERING

Introduction: Waste: Dry, semi liquid, liquid, Necessity of systematic collection and disposal of waste. Brief description of sewage disposal system. Conservancy and water carriage system, their advantages and disadvantages.

Quantity of Sewage: (i) Sewage: Domestic, industrial and storm water. **(ii)** Volume of domestic sewage (DWF), variability of flow, limiting velocities in sewers. **(iii)** Use of table as per I:S 1742-1983 to determine relationship between gradient, diameter, discharge and velocity.

(10 Lectures)

Unit:- II

Sewerage Systems: (i) Types of sewerage systems separate, combined and partially separate. **(ii)** Sewers : Stone ware, cast iron, concrete and masonry sewers their sizes and joints. **(iii)** Appurtenances: (Location, function and construction) manholes, drop manhole, lamp hole catch basin, inverted siphon, flushing tanks, ventilating shafts and storm water flows. **(iv) Laying of sewers:** Setting out alignment of sewer. Excavation, checking the gradient with the help of boning rods, preparation of bedding, handling, lowering, laying and jointing, testing and backfilling. **(v)** Construction of surface drains and different sections required.

(10 Lectures)

Unit:- III

Building Drainage: (i) Aims of building drainage and its requirements. General layout of sanitary fittings and house drainage arrangement for a building (single and multistoried)as per IS 1742-1983. **(ii)** Different sanitary fittings and their installation**. (iii)** Traps, seal in traps, causes of breaking of seal, precautions taken, Gulley, Intercepting and Grease traps. **(iv)** Testing of house drainage. **(10 Lectures)**

Unit:- IV

Rural Sanitation: (a) Drainage: Topography, alignment of lanes and bye lanes, storm water, natural passage, development of drains, alignment, size and gradient. Phase Programme. **(b)** Disposal of night soil and village latrines : **(i)** Collection and disposal of garbage and refuse. **(ii)** Septic tanks, cess pools/soak pit (design of septic tank, soak pit/cess pools), privy pit and bore hole latrines. **(iii)** Biogas plant, constructional details, uses and maintenance. **(c)** Guide lines for future development of village. **(10 Lectures)**

Unit:- V

Maintenance: Inspection of mains, cleaning and flushing of sewers. Precautions during cleaning, maintenance of traps, cleaning of house drainage line. Tools and equipment needed for maintenance.

Sewage Disposal: (i) General composition of sewage, importance & method of determination of O.D., B.O.D. and C.O.D. **(ii)** Disposal methods. Land disposal, disposal by dilution and disposal in sea. Merits and demerits. **(iii)** Nuisance due to disposal, self purification of streams, conditions of disposal.

Sewage Treatment: **(i)** Meaning and principle of primary and secondary treatment, constructional details of screening chamber, grit chamber, clarifier, trickling filters, secondary clarifiers/aeration tank. **(ii)** Sludge treatment, sludge digestion, sludge drying; sludge disposal. **(iii)** Oxidation ponds. **(10 Lectures)**

Project work

A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 – 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

Text Books:-

1. . Rangwala S.C*, Water Supply & Sanitary Engineering*, Charotar Publshing House (P) Ltd., Anand.
2. Gurcharan Singh*, Water Supply & Sanitary Engineering*, Standard Publishers Distributors, Delhi.
3. Garg S.K.*, Water Supply Engineering*, Khanna Publishers, Delhi.
4. Gupta D.V.*, Water Supply & Sanitary Engineering*, Asian Publishers, Muzaffarnagar.

Reference Books:-

1. Modi P.N.*, Water Supply Engineering*, Standard Book House, Delhi

Communication Technique
Fifth Semester

Course Code: DIP 501	L	T	P	C
	2	0	2	3

Course Content:

Unit I

Oral Communication: Principles of effective Oral Communication, Vitals of Communication, Interpersonal Communication, persuasive Communication. **(8 hours)**

Practical (oral): Practice of oral Communication. **(2 hours)**

Unit II

Presentation Strategies: Purpose, Audience & Locale, Audio-visual aids, Body Language, Voice dynamics. **(8 hours)**

Practical (oral): Making students develop presentation skills. **(2 hours)**

Unit III

Speaking Skills: Improving voice & speech, Art of public speaking, Dealing with the Boss, Dealing with subordinates. **(8 hours)**

Practical (oral): Making the students speak on topic. **(2 hours)**

Unit IV

Group Discussion: Tips & Style. **(8 hours)**

Practical (Oral): To make students participate in G.D. **(2 hours)**

Recommended Books:

1. Raman Meenakshi & Sharma Sangeeta – Technical Communication – Principles & Practices, - ONP, N. Delhi.
2. Mitra Barun k. - Effective Technical Communication-O.U.P.N. Delhi.

NOTE:

This syllabus has been designed to improve the oral and written communication skills of students. The faculty members should put emphasis on practical (oral) activities for generating students' interest in language learning.

*** Latest editions of all the suggested books are recommended.**

TRANSPORTATION ENGINEERING LAB
Fifth Semester

	L	T	P	C
Course Code: DCE 551	**-**	**-**	**3**	**2**

List of Experiments

1. Determination of resistance to abrasion of aggregates by Los Angel's Abrasion Testing Machine.
2. Determination of Aggregate impact value by aggregate impact tester.
3. Determination of C.B.R. Value of sub grade soil.
4. Determination of Aggregate crushing value by aggregate crushing test apparatus.
5. Determination of Penetration Value of bitumen.
6. Determination of softening point of bitumen.
7. Determination of ductility of bitumen.
8. Determination of flash and fire point of bitumen.

Field Visits of at least 3 of the following (in different fields):

1. Railway yard and station, points and crossing, rack, communication, control and panel Board.
2. Railway Museum for the development of Railways, Rails Mono Rails, Sleepers--R.D.S.O. Lucknow & Rail Bhawan Delhi
3. Bridges under construction.
4. Grade seperator.
5. Factory for construction of prestressed sleepers or other fixtures. 6. P.W.D. Research Lab at Lucknow/C.B.R.I. Roorkee.
7. Hume Pipe Factory.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (40 MARKS)			VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (25 MARKS)	ATTENDANCE (10 MARKS)	QUIZ (5 MARKS)		

External Evaluation (50 marks)

The evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

Surveying II – Lab
Fifth Semester

	L	T	P	C
Course Code: DCE 552	**-**	**-**	**6**	**3**

1. Plane Tabling:-

Ex. (i) **(a)** Setting the plane table **Plate-1.**
(b) Marking the North direction.
(c) Plotting a few points by Radiation method.

Ex. (ii) **(a)** Orientation by **Plate-1.**
- Trough compass
- back sighting.
(b) Plotting a few points by Intersection method.

Ex. (iii) Traversing an area with a plane table (at least five lines) **Plate-1.**

Ex. (iv) **(a)** Two point problem. **Plate-2.**
(b) Three point problem by
- Tracing paper method.
- Bessel's graphical method.
- Trial and error method.

(B) Contouring:-

Ex. (v) Preparing a contour plan by radial line, method by the use of a Tangent clinometers/Tachometer. **Plate 1.**

Ex. (vi) Preparing a contour plan by method of squares. **Plate 1.**

(C) Theodolite:-

Ex. (vii) Drill for taking out, the Theodolite Mounting on the tripod and placing it back in the Box.

Ex. (viii) Reading the vernier and working out the least count. Measurement of horizontal angles by repetition and reiteration method.

Ex. (ix) Traversing an area with a Thedolite (at least five lines) and Plotting the traverse by calculating Latitude and Departure.

Ex. (x) Measurement of vertical angles by the use of Theodilite.

Ex. (xi) Measurement of Magnetic Bearing of a line.

Ex. (xii) Prolonging a line.

Ex. (xiii) Running a closed traverse with a Theodolite (at least five sides) and its plotting. **Plate 1.**

(D) Curves:-

Ex. (xiv) Setting out a Simple Circular Curve with given data by the following methods - **Plate 1.**
(a) Offsets from main chord.
(b) Offsets from the chords produced.
(c) One Theodolite method.

Ex. (xv) Setting out a circular cure with transition length by linear measurements. **Plate 1.**

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (40 MARKS)			VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (25 MARKS)	ATTENDANCE (10 MARKS)	QUIZ (5 MARKS)		

External Evaluation (50 marks)

The evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

CIVIL ENGINEERING DRAWING – II
Fifth Semester

	L	T	P	C
Course Code: DCE 553	**2**	**-**	**6**	**5**

PART A : STEEL STRUCTURAL DRAWING

1. Preparation of a working drawing (elevation, plan, details of joints at ridge, eaves and other connections) for a riveted steel roof truss resting on a masonry wall for the given span, shape of the truss and the design data regarding the size of the members and the connections. also calculate the quantity of steel for the truss.

2. Tubular Steel Roof Trusses : Types of trusses for different spans. Details ofm column -truss connection. Simple trusses using tubular sections. North light provision.

3. Steel connections (a, b, c, d) riveted and (e) welded All unstiffened.

(a) Beam to beam connections (seated and framed)

(b) Beam to column (seated and framed)

(c) Column base connections (slab base & gusseted base) **3x12**

PART B : R.C.C. STRUCTURES(On Computer by Auto Cad

PUBLIC BUILDING:-Plan elevation & sections of a public building like school. hospital, canteen, community hall, guest house. at least double strayed showing details of following

RCC elements: (i) R.C.C. beam singly reinforced and doubly reinforced giving the size and number of bars, stirrups their size and spacing.

(ii) Details of reinforcement for a RCC square and circular column with isolated square footing.

(iii) Details of reinforcement for a cantilever beam with given data regarding the size of the beam and the reinforcement. Anchorage of reinforcement.

NOTE: Bar bending schedules for each of the three above items will be prepared:

2. Details of reinforcement in plan and section for a simply supported RCC. One way slab with intermediate support and two way slab. Bar bending schedule should
be prepared.

3. Details of reinforcement of a two strayed internal and corner column. The details of reinforcement at the junction with beams must be shown. Details of reinforcement of the junction of a secondary beam with the main beam with the given data.

4.i. Sectional details of T-beam showing details of bars

ii. Details of reinforcement for a cantilever retaining wall with the given design data regarding the reinforcement, size and shape of the wall.

iii. Details of reinforcement in a simple circular overhead water tank. **4x16**

PART C : IRRIGATION ENGINEERING :

(i) a. Typical sections of a channel. Typical cross-section of an unlined and lined channel in cutting, partly cutting and fully in filling.

b. Typical L-section of a distributor.

(ii) Plan and cross-section of tube well with pump house.

(iii) Plan, cross-section and L-section of a distributor fall with details of wing wall, pitching, flooring and tube well. **2x8**

PART D:- Reading and interpreting Civil Engg. Drawing.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a scale of 5 which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (40 MARKS)			VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (25 MARKS)	ATTENDANCE (10 MARKS)	QUIZ (5 MARKS)		

External Evaluation (50 marks)

The evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

Text Books:-

1. Singh Gurcharan, *Civil Engineering Drawing*, Standard Publishers Distributors, Delhi.
2. Chakarwarti M., *Civil Engineering Drawing*.

SURVEY CAMP

Course Code: DCE555

L	T	P	C
-	-	-	4

The students would be required to undertake a survey camp which will preferably be in a hilly area.

The camp will be for four weeks after the fifth semester examination. Students would be divided equally amongst the faculty of the Civil Engineering department who would oversee the daily activity and the camp progress. Each team will consist of 3-4 students and the following activities shall be carried out during the camp. Students will be expected to use the latest equipments and methodology to complete the camp activities.

1. Reconnaissance survey and selection of control points
2. Establishment of control points and reconnaissance map preparation
3. Theodolite observations of traverse/triangulation station
4. Measurement of base lines of traverse/triangulation station
5. Leveling and Bearing observations of traverse/triangulation station
6. Adjustment of errors in observations and Computation of Coordinates
7. Preparing grid on plane table sheet and draw the diagonal scale and Plot the control stations with the help of coordinates
8. Field checking of control points and plotting the details using Radiation Method as well taking the elevations
9. Use of Radiation and Intersection methods to plot the details on Plane Table as well as taking the elevations
10. Use of Lehmann's Rules to solve Three Point Problem
11. Plotting the contours simultaneously with Plane Table work
12. Formatting, Inking and Colouring the Plane Table Map

Each group will complete the above and submit the report of the camp in the format along with the level book, calculation sheets and final results.
The camp performance will be evaluated as in case of practical evaluation. **(8 Hours)**

Project work
A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 – 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

Recommended Books:

1. Mishra Sunita & Muraliksishra C., *Communication Skills for Engineers* – Pearson Education, New Delhi.
2. Raman Meenakshi & Sharma Sangeeta, *Technical Communication-Principles & Practice* – O.U.P. New Delhi. 2007.
3. Mohan Krishna & Banerji Meera, *Developing Communication Skills* – Macmillan India Ltd. Delhi.

DESIGN OF REINFORCED CONCRETE (RCC) STRUCTURE

Sixth Semester

	L	T	P	C
Course Code: DCE 601	**3**	**1**	**-**	**4**

Course Contents:

Unit:- I

Introduction: Concept of reinforced concrete structures, advantages and disadvantages. Different materials used in RCC with their properties. Load and loading standard as per IS:875 Concept of design of reinforced concrete based on working stresses method and limit state method and their difference.

(A) Design based on Working Stress Method: Fundamental of working stress method: **(i)** Assumptions in the theory of simple bending for RCC beams. **(ii)** Flexural strength of a singly reinforced RCC beam. Position of the Neutral Axis. Resisting moment of the section, critical neutral axis, actual neutral axis, concept of balanced, under reinforced and over-reinforced sections. **(iii)**Shear Strength : Permissible shear stresses as per IS:456. Development of stresses in reinforcement, development length and anchoring of bars. **(iv)** Bond Strength: Concept of bond, local and average, permissible bond stresses for plain and deformed bars as per IS, minimum length of embedment of bars, minimum splice length, actual bond stress in RCC beams and slabs, bond length as per IS: 456. Design of singly reinforced concrete beams as per IS:456 from the given data such as span, load and properties of materials used. Design of lintel. **(12 Lectures)**

Unit:- II

Design of a cantilever beam and slab. Design of Doubly Reinforced Concrete Beams: (i) Doubly reinforced concrete beam and its necessity., **(ii)** Strength of a double reinforced concrete beam section., **(iii)** Method of design: Simple problems only. **(iv)** Reinforcement details of doubly reinforced concrete beam.

Design of RCC Slabs:- (i) Structural behavior of slabs under uniformly distributed load (UDL)., **(ii)** Types of end supports., **(iii)** Design of one way slab., **(iv)** Design of Two-way slab with the help of tables of IS:456.(Corners not held down)-IS-code method., **(v)** Detailing of reinforcement.

Design of Reinforced Brick-Work:- (i) Plain brick masonry, permissible stresses.**, (ii)** Reinforced Brick work and its use in slabs and lintels**, (iii)** Limitations of the use of R.B. Work., **(iv)** General principles of design of reinforced brick lintels and slabs.**, (v)** Design of R.B. beams, slab and lintels. **(12 Lectures)**

Unit:- III

Design of Tee Beams:- (i) Structural behavior of a beam and slab floor laid monolithically.**, (ii)** Rules for the design of T-Beams., **(iii)** Economical depth of T-Beams, Strength of T-Beams., **(iv)** Design of singly reinforced Tee-Beams.**, (v)** Detailing of reinforcement. **Design of Columns & Column Footings:- (i)** Concept of long and short columns. **(ii)** Is specifications for main and lateral reinforcement. **(iii)**Behavior of RCC column under axial load. **(iv)**Design of Axially loaded short and long columns with hinged ends (circular, square and rectangular as per IS specifications). **(v)** Concept of column footing. Design criteria. Design of square isolated column footings. **(vi)** Detailing of reinforcement.

Cantilever Retaining Wall:- Concept of design and function of different parts of a cantilever retaining wall and reinforcement details (No numerical shall be asked in the examination).

(12 Lectures)

Unit:- IV

Design Based on Limit State Method:- Fundamentals of Limit State Method i. Theory of limit state method. **ii.** Partial safety factors. **iii.** Flexural strength. **iv.** Shear Strength. **v.** Development Length of bars. Design requirements. **(12 Lectures)**

Unit:- V

Design of the following : i. Singly reinforced rectangular beam. **ii.** One way slab (simply supported) **Pre-Stressed Concrete i.** Concept of prestressing. **ii.** Situations where prestressed concrete is used. **iii.** Materials used in prestressed concrete and their specifications as per IS. **iv.** Post-tensioning and pre-tensioning. **v.** Systems of prestressing. **vi.** Freyssinet, Magnol-Blaten and Lee-Me call systems **vii.** Sketch showing Prestressing arrangement for RCC beam (No numerical problems be asked in the examination) **(12 Lectures)**

Project work

A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 – 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

Text Books:-

1. Minocha & Diwedi, *Design of R.C.C. Structures*, B. Bharat Prakshain, Merrut.
2. S.K. Mallick*, Reinforced Concrete*, Oxford & IBH Publshing Co., Delhi.
3. Ashok K. Jain, *Reinforced Concrete* by Limit State Design by Nem Chand & Bros., Roorkee.

Reference Books:-

1. Punmia B.C.*, Limit State Design of Reinforced Concrete*, Laxmi Publication (P), Delhi.
2. Raju N.K.*, Reinforced Concrete Design IS 456 – 2000 Principles & Practice*, New Age International Publishers, New Delhi.
3. BIS*, IS 456 – 2000 Code of Practice for Plain & Reinforced Concrete*.

DESIGN OF STEEL STRUCTURES

Sixth Semester

	L	T	P	C
Course Code: DCE 602	**3**	**1**	**-**	**4**

Course Contents:

Unit:- I

Structural Steel and Sections: (i) Properties of structural steel as per IS:226 and IS:1977. **(ii)** Designation of structural steel sections as per IS Handbook and IS:800.

Structural Steel Connections: (i) Riveted connections - types of rivets, permissible stresses in rivets. Types of riveted joints, Failure of riveted joints, Assumptions made in the design of riveted joints. Specification for riveted joints. Design of riveted joints for axially loaded members. **(ii)** Welded Connections Comparison between riveted and welded joints, types of welds, permissible stresses in welds, types of welded connections, strength of welded joint, Design of welded joints for axially loaded members. (**12 Lectures)**

Unit:- II

Tension Members: Forms of common sections. Permissible Stresses in tension for steel. Strength of a tension member. Design of tension members (flats, angles & Tee Sections only). Tension splice and their design. **(12 Lectures)**

Unit:- III

Compression Members: Design of struts and columns as per IS:800. Effective length, slenderness ratio and permissible stresses, simple and built up sections, concept of lacings in built up columns. **(12 Lectures)**

Unit:- IV

Beams: Design criteria, allowable stresses, Design of laterally restrained beams including simple built-up sections. Checks for web bulking , web crippling and deflection.

(12 Lectures)

Unit:- V

Column Bases:- Column bases, design of simple column base . **(12 Lectures)**

Project work

A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 – 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

Text Books:-

1. Ram Chandra, *Design of steel Structures*, Standard Book House, Delhi.
2. Negi L.S., *Design of steel Structures*, Tata Mc. Graw Hill Education Pvt. Ltd., Delhi.
3. Minocha & Diwedi, *Theory & Design of steel Masonry Structures*, B. Bharat Prakshain, Merrut.

Reference Books:-

1. Punmia B.C., *Design of steel Structures*, Laxmi Publication (P) Ltd., Delhi.
2. Ramamarutham S., *Design of steel Structures*, Dhanpat Rai Publishing Co., Delhi.
3. BIS, *IS 800 – 2005 Code of Practice for General Construction in steel*.

TRANSPORTATION ENGINEERING – II

Sixth Semester

	L	T	P	C
Course Code: DCE 603	**3**	**1**	**-**	**4**

Course Contents:

Unit:- I

RAILWAYS

Introduction: Railways - An important system of communication in India.

Permanent Way: Definition of a permanent way; components of a permanent way, sub grade, ballast, sleepers, rails, fixtures and fastenings. Concept of gauge and different gauges prevalent in India. Suitability of these gauges under different conditions.

Track Materials: (i) RAILS: Function of rails. Different types of rail sections-double header, bull headed and flat footed their standard length, weights and comparison. Welded rails-appropriate length of welded rails and advantages of welded rails. Creep: Its definition, causes, effects and prevention. Wear of rails: its causes and effects. **(ii)** SLEEPERS: Function of sleepers; Different types of sleepers: wooden, steel, cast iron(pot type),concrete and prestressed concrete, their sizes, shapes, characteristics and spacing. **(iii)** BALLAST: Function, materials used for making ballast stone, brick, slag and cinder, their characteristics. **(iv)** FIXTURES AND FASTENINGS:

- **(a)** Connections of rail to rail-Fishplate and fish bolts.
- **(b)** Connection of Rail to sleepers: Sketches of connection between flat footed rails with various types sleepers with details of fixtures and fasteners used.

(10 Lectures)

Unit:- II

Geometrics for Broad Gauge: Typical Cross-sections of single and double broad gauge railway tracks in cutting and embankment. Permanent and temporary land width. Gradients ruling, maximum, minimum for drainage. Gradients in station yards. Curves; Limiting radius of a curve for broad gauge. Transition length to be provided for railway curves as per railway code. Super-elevation-its necessity and limiting value. Definition of equilibrium cant and cant deficiency, widening of gauage on curves.

Points and Crossings: Necessity and details of arrangement; sketch of a turnout definition of stock rail, tongue rail, check rail, lead rail, wing rail, point rail, splice rail, stretcher bar, throw of switch, heel of switch, nose of crossing, angle of crossing, overall length of turnout, facing and trailing points, diamond crossing, cross over, triangle.

Track Laying: Preparation of sub grade. Collection of materials setting up of material depot and carrying out initial operations such as adzing of sleepers, bending of rails and assembling of crossings. Definitions of base and rail head. Transportation by material trellises, rail carriers and material trains. Method of track laying (parallel, telescopic and American methods). Organization of layout at rail head. Ballasting of the track.

Maintenance of Track: (i) Routine maintenance of formation and side slopes, rails, fixtures and drainage. **(ii)** Special maintenance - Replacement of defective sleepers and rails. **(iii)** Tools used for the above operations.

NOTE: The study of the subject must be supplemented by a visit to a nearby railway station.

(10 Lectures)

Unit:- III

BRIDGES

INTRODUCTION: Bridge: Its function and component parts, different parts, difference between a bridge and a culvert.

CLASSIFICATION OF BRIDGES:
Their structural elements and suitability:
(i) According to life: Permanent and temporary. **(ii)** According to road way level: Deck, through and semi-through. **(iii)** According to material: Wooden, steel, RCC, prestressed and masonry. **(iv)** According to structural form:
(a) Beam type-RCC,T-Beam, steel girder bridges, plate girder and box girder, trussed bridges N and warren girder bridges. **(b)** Arch type-open spandrel and filled spandrel, barrel and rib type. **(c)** Suspension type-Unstiffened sling type, its description with sketches. **(d)** According to the position of highest flood level: submersible and non submersible. **(10 Lectures)**

Unit:- IV
Site selection and collection of data: Factors affecting the selection of site for a bridge data to be collected. Bridge span : Economical span and factors affecting it.
Piers, abutments and wing walls: Piers: Definition parts. Types: solid (masonry and RCC); Open cylindrical and abutment piers. Definition of the following terms; height of pier, water way (natural and artificial),afflux and clearance. Abutments and wing walls: Definition, types of abutments (straight and tee) abutment with wing walls (straight, splayed, return and curved).
Bridge Bearings: Purpose of bearings: Types of bearings: Fixed plate, sliding plate, deep cast base, rocker and roller bearings, their functions with sketches.
Temporary Bridges: Necessity, description with sketches of pontoon and boat bridges.
Maintenance of Bridges: Inspection of bridges, routine maintenance. **(10 Lectures)**

Unit:- V
Air Port: Basic Element, Runway and Taxi Way. Tunnel: Introduction, Classification and Construction Method. **(6 Lectures)**

Project work
A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 – 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

Text Books:-

1. Gupta B.L., *Road, Railway, Bridges, Tunnels& Harbour Dock Engineering*, Standard Publishers Distributors, Delhi.
2. Rangwala S.C., *Highway Engineering*, Charotar Publshing House (P) Ltd., Anand.
3. Ahuja & Birdi, *Road, Railway, Bridges & tunnels Engineering*, Standard Books House, Delhi.

Reference Books:-

1. Khana S.K. & Justo, *Highway Engineering*, Nem Chand & Bros., Roorkee.

EARTHQUAKE ENGINEERING

Sixth Semester

	L	T	P	C
Course Code: DCE 604	**3**	**-**	**-**	**3**

Course Contents:

Unit:- I

Causes of earthquakes and seismic waves, magnitude, intensity and energy release, Basic terminology, Characteristics of earthquakes, Seismic hazard, vulnerability and risk, Seismic Zoning. Earthquakes performance of structures in past earthquakes. **(8 Lectures)**

Unit:- II

Philosophy of earthquake resistant design and concept of ductility, Short and long period structures, Concept of spectrum, Static force calculations. Architectural considerations : Building simplicity, symmetry. Irregularities, Continuity and Uniformity. **(8 Lectures)**

Unit:- III

Effect of soils and liquefaction, Remedial measures, Construction of earth structures. Seismic construction of masonry buildings, precisions of IS:4326. **(6 Lectures)**

Unit:- IV

Seismic construction of RC buildings detailing, provisions of IS: 13920. Retrofitting of masonry and reinforced concrete buildings. **(6 Lectures)**

Unit:- V

DISASTER MANAGEMENT :

Definition of disaster - Natural and Manmade, Type of disaster management, How disaster forms, Destructive power, Causes and Hazards, Case study of Tsunami Disaster, National policy- Its objective and main features, National Environment Policy, Need for central intervention, State Disaster Authority- Duties and powers, Case studies of various Disaster in the country, Meaning and benefit of vulnerability reduction, Factor promoting vulnerability reduction and mitigation, Emergency support function plan. Main feature and function of National Disaster Management Frame Work, Disaster mitigation and prevention, Legal Policy Frame Work, Early warning system, Human Resource Development and Function, Information dissemination and communication. **(10 Lectures)**

Project work

A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 – 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

Text Books:-

1. Srivastava H.N., *Earthquakes Geography and Management*, New Age International Publishers, Delhi.
2. Jai Krishna, *Elements of Earthquake Engineering*, South Asian Publishers, New Delhi.
3. Chopra A.K., *Dynamics of Structure*, Pearson Education.

Reference Books:-

1. Agarwal P.N., *Engineering Seismology*, Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
2. Richter C.F., *Elementary Seismology*, Eurasia Publishing House Pvt. Ltd., New Delhi.
3. *IS: 4326 India Standard- "Earthquake Resistant Design and Construction of Buildings* – Code of Practice" Bureau of Indian Standard, Mank Bhawan, New Delhi.
4. *IS: 13920 India Standard- "Ductile Detailing of Reinforced Concrete Structures Subjected to Seismic Forces"* Bureau of Indian Standard, Mank Bhawan, New Delhi.

ESTIMATING, COSTING AND VALUATION

Sixth Semester

	L	T	P	C
Course Code: DCE 605	**2**	**3**	**-**	**4**

Course Contents:

Unit:-I

Buildings

Introduction to Estimating: Types of estimates, drawings, (to be attached with these estimates. Preparation of rough cost estimates).

Units of measurement, and units of payment of different items of work.

Different methods of taking out quantities: Centre line in-to-in/out-to-out methods.

(8 Lectures)

Unit:- II

Preparation of a detailed estimate, complete with detailed reports, specifications, abstract of cost and material statement for a small residential building with a flat roof.

Preparation of a detailed estimate with specification, abstract of cost and material statement for pitched roof with steel truss only.

Specifications

Need, general and detailed specifications, method of writing specifications,

Analysis of rates:- **(i)** Steps in the analysis of rates for any item of work, requirement of material, lab our, sundries T.& P. contractors profit.**(ii)** Calculation of quantities of materials for: **(a)** Plain cement concrete of different proportions. **(b)** Brick masonry in cement and lime mortar. **(c)** Plastering and pointing with cement mortar in different proportions. **(d)** White washing.

Analysis of Rates:- Analysis of rates of the following item of work when the data regarding lab our, rates of material and rates of lab our is given.

(a) Earth work in excavation and filling with a concept of lead and lift. **(b)** Cement concrete in foundation. **(c)** R.C.C. and R.B. in roof slabs. **(d)** First class burnt brick masonry in cement mortar. **(e)** Cement plaster. **(f)** Cement pointing: Flush, deep pointing. Tender and preparation of tender document. **(24 Lectures)**

Unit:- III

Irrigation

Preparation of detailed estimate for a brick lined distributor from a given section.

Public health Preparation of detailed estimate for laying a water supply line (C.I. Pipe). Preparation of detailed estimate for sanitary and water supply fittings in a domestic building containing one set of toilets and septic tank. **(20 Lectures)**

Unit:- IV

Roads:- Methods for calculating earth work using:- **(i)** Average depth. **(ii)** Average cross sectional area. **(iii)** Graphical method.

Calculations of quantities of materials for roads in plains from given drawings.

Preparation of detailed estimate using the above quantities. Detailed estimate of a single span slab culvert with return wing walls. Calculation of quantities of different items of work for a masonry retaining wall from given drawings. **(24 Lectures)**

Unit:- V

Valuation

Purpose of valuation, principles of valuation. Definition of terms such as depreciation, sinking fund, salvage and scrap value. Valuation of a building property by replacement cost method and rental return method. Method of calculation of standard rent-Concept of capitalized value and years purchase. **(20 Lectures)**

Project work

A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 – 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

Text Books:-

1. Rangwalala S.C., *Estimating, Costing & Valuation*, Charotar Publishing House Pvt. Ltd., Anand.
2. Dutta B.N., *Estimating & Costing in Civil Engineering*, UBS Publishers Pvt. Ltd., New Delhi.

Reference Books:-

1. Birdi G.S., *Estimating, Costing & Valuation*.

Corporate Communication
Sixth Semester

Course Code: DIP 601	L	T	P	C
	2	0	2	3

Course Content:

Unit I

Corporate Behaviour: Corporate expectation, office etiquettes, Telephonic Conversation & etiquette. **(8 hours)**

Practical (oral): To make the students aware of Corporate life & culture & also to teach them about telephone courtesy etc. **(2 hours)**

Unit II

Communication: Press Communication, Press note, e-mail, Inviting tenders, Writing advertisements, Writing notices. **(8 hours)**

Practical (oral): To make students develop the understanding of media importance. **(2 hours)**

Unit III

Interview Skills: Concept & Process, Preparing for the Interview, Types of Interview. **(8 hours)**

Practical (oral): Mock Interview Practice. **(2 hours)**

Unit IV

Modern Technology & Communication: Globalization impact, Role of Information Technology, Tele-Communication, Internet, Tele- Conferencing and Video-Conferencing. **(8 hours)**

Practical (oral): To make students speak on I.T./Internet/Tele & Video Conferencing. **(2 hours)**

Recommended Books:

1. Chhabra T.N. – Business Communication Sun India Pub. N.Delhi.
2. Raman Meenakshi & Sharma Sangeeta – Technical Communication – Principles & Practices, - ONP, N. Delhi.

NOTE:

This syllabus has been designed to improve the oral and written communication skills of students. The faculty members should put emphasis on practical (oral) activities for generating students' interest in language learning.

*** Latest editions of all the suggested books are recommended.**

R.C.C. LAB

Sixth Semester

	L	T	P	C
Course Code: DCE 651	**-**	**-**	**4**	**2**

Preparation of bar bending schedule and to bend the bars accordingly for the following:

(i) Singly reinforced concrete beam
(ii) Doubly reinforced concrete beam
(iii) Reinforced concrete column
(iv) Reinforced concrete slab

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (40 MARKS)			VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (25 MARKS)	ATTENDANCE (10 MARKS)	QUIZ (5 MARKS)		

External Evaluation (50 marks)

The evaluation would also be done by the external Examiner based on the experiment conducted during the examination.

DESIGN PROJECT ON CAD LAB

Sixth Semester

	L	T	P	C
Course Code: DCE 652	**2**	**-**	**4**	**4**

Preparation of any such project:

(i) Survey and soil investigation, planning, designing preparing working drawings, estimation and scheduling of a work for a small building including writing of Technical Report.

(ii) Planning a water supply and drainage system for a house. Preparation of working drawings for all the sanitary fittings. Estimating quantity of materials and cost including writing of technical report.

(iii) Preparation of water supply and drainage scheme for a small colony with all working drawings, estimates and schedule of works including writing of technical report.

(iv) Given topographical sheet of the area, select alignment of a small length of road connecting two stations. Preparation of detailed drawings (L-section, cross section and plan). Detailed estimate, schedule of work and writing of technical report.

(v) Selection of type design for a culvert to be proposed over a river let crossing a road. Preparation of working drawings, detailed estimate, schedule of work and writing of technical report.

(vi) Conducting survey, preparation of drawings, Estimate and writing technical report for the improvement and widening of an existing road.

(vii) Conducting survey work, preparation of plans, making proposals for improvement, preparation of estimate for existing road including writing of technical report.

(viii) Conducting survey work, preparation of plan, L-section and cross-section of a small distributory making proposals and preparing detailed estimates for earth work including writing of technical report.

(ix) Conducting survey work of a depression, making proposals for bund, working out capacity of reservoir and design of irrigation system including writing of technical report.

(x) Planning of small civil engineering work including designs, drawings, estimates and technical report writing.

(xi) Other problem with in syllabus including survey work, design, drawing, estimate and technical report writing.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

Each experiment would be evaluated by the faculty concerned on the date of the experiment on a 5 point scale which would include the practical conducted by the students and a Viva taken by the faculty concerned. The marks shall be entered on the index sheet of the practical file.

Evaluation scheme:

PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (40 MARKS)			VIVA (10 MARKS)	TOTAL INTERNAL (50 MARKS)
EXPERIMENT (25 MARKS)	ATTENDANCE (10 MARKS)	QUIZ (5 MARKS)		

External Evaluation (50 marks)

The evaluation would also be done by the external Examiner based on the experiment conducted during the examination.