Study & Evaluation Scheme

of

Diploma in Civil Engineering

[Applicable w. e. f. session 2017-18 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/Hindi**
Minimum Required Attendance	:	75 %

Assessment (Theory and Project) :

Internal	External	Total
30+10 (Project)	60	100

Maximum Credit : **178**

Minimum Credit Required for the degree : **174**

Internal Evaluation (Theory Papers & Project) :

Class Test I	Class Test II	Class Test III	Class Quiz/Assign/Project	Attendance	Grand Total
Best two out of the three					
10 Marks	10 Marks	10 Marks	10 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 45% marks in aggregate to clear the semester.

Question paper structure

1. *The question paper shall consist of 6 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 2 marks each).*
2. *Out of the remaining 5 questions, the long answer pattern will have internal choice with unit wise questions with internal choice in each unit. In units having numerical, weightage and information should be available in the syllabus & the paper pattern. The weightage of question No.2 to 6 shall be 10 markseach.*

Study & Evaluation Scheme
Program: Diploma in Civil Engineering

Semester- I

S. No.	*Course Code*	*Subject*	*Periods*			*Credit*	*Evaluation Scheme*		
			L	*T*	*P*		*Internal*	*External*	*Total*
1	DIP111	Applied Mathematics – I	3	2	-	4	40	60	100
2	DIP112/ DIP113	Applied Physics OR Applied Chemistry	3	2	-	4	40	60	100
3	DIP104/ DIP105	Basics of Electrical & Civil Engineering OR Basics of Electronics & Mechanical Engineering	4	-	-	4	40	60	100
4	DIP131/ DIP107	Computer Fundamentals, Internet, & MS-Office OR Applied Mechanics	3	1	-	4	40	60	100
5	DIP199	English Communication & Soft Skills – I	3	-	2	4	50	50	100
6	DIP181/ DIP182	Physics Lab OR Chemistry Lab	-	-	3	2	50	50	100
7	DIP153/ DIP154	Electrical Engineering Lab OR Electronics Engineering Lab	-	-	3	2	50	50	100
8	DIP155/ DIP156	Information Technology Lab OR Applied Mechanics Lab	-	-	3	2	50	50	100
9	DIP187 OR DIP188	Workshop Practice OR Engineering Drawing	-	-	6	3	50	50	100
Total			**16**	**5**	**17**	**29**	**410**	**490**	**900**

Semester- II

S. No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	DIP201	Applied Mathematics – II	3	2	-	4	40	60	100
2	DIP203/ DIP202	Applied Chemistry OR Applied Physics	3	2	-	4	40	60	100
3	DIP205/ DIP204	Basics of Electronics & Mechanical Engineering OR Basics of Electrical & Civil Engineering	4	-	-	4	40	60	100
4	DIP207/ DIP231	Applied Mechanics OR Computer Fundamentals, Internet, & MS-Office	3	1	-	4	40	60	100
5	DIP299	English Communication & Soft Skills – II	3	-	2	4	50	50	100
6	DIP252/ DIP251	Chemistry Lab OR Physics Lab	-	-	3	2	50	50	100
7	DIP254/ DIP253	Electronics Engineering Lab OR Electrical Engineering Lab	-	-	3	2	50	50	100
8	DIP256/ DIP255	Applied Mechanics Lab OR Information Technology Lab	-	-	3	2	50	50	100
9	DIP258/ DIP257	Engineering Drawing OR Workshop Practice	-	-	6	3	50	50	100
		Total	**16**	**5**	**17**	**29**	**410**	**490**	**900**

Semester- III

S. No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	DCE301	Surveying – I	3	-	-	3	40	60	100
2	DCE303	Building Materials	3	-	-	3	40	60	100
3	DCE304	Building Construction	3	1	-	4	40	60	100
4	DME301	Strength of Materials	3	1	-	4	40	60	100
5	DME302	Hydraulics	4	-	-	4	40	60	100
6	DIP399	English Communication & Soft Skills – III	3	-	2	4	50	50	100
7	DCE351	Surveying Lab – I	-	-	6	3	50	50	100
8	DCE352	Building Construction Lab	-	-	3	2	50	50	100
9	DME351	Strength of Materials Lab	-	-	4	2	50	50	100
10	DME352	Hydraulics Lab	-	-	3	2	50	50	100
Total			**19**	**2**	**18**	**31**	**450**	**550**	**1000**

***Additional course for Lateral entry students with Intermediate background to be taken in III Semester & course should be passed with minimum of 45% marks: credits will not be added.**

1	DIP359*	Concept of Information System Lab	-	-	3	-	50	50	100

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	-	4	40	60	100
2	DCE402	Public Health Engineering – I	2	2	-	3	40	60	100
3	DCE403	Concrete Technology	3	-	-	3	40	60	100
4	DCE404	Irrigation Engineering	3	1	-	4	40	60	100
5	DCE406	Construction Management	3	-	-	3	40	60	100
6	DIP499	English Communication & Soft Skills – IV	3	-	2	4	50	50	100
7	DCE451	Soil Mechanics & Foundation Engineering Lab	-	-	4	2	50	50	100
8	DCE452	Public Health Engineering Lab	-	-	2	1	50	50	100
9	DCE453	Concrete Technology Lab	-	-	4	2	50	50	100
10	DCE454	Civil Engineering Drawing – I	-	-	8	4	50	50	100
Total			**17**	**4**	**20**	**30**	**450**	**550**	**1000**

Semester- V

S. No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	DCE501	Transportation Engineering – I	3	2	-	4	40	60	100
2	DCE502	Surveying – II	3	2	-	4	40	60	100
3	DCE505	Public Health Engineering – II	2	2	-	3	40	60	100
4	DCE508	Construction Accounts	2	2	-	3	40	60	100
5	DIP502/ DIP503❖	Industrial Ecology/ Environment Studies	4	-	-	4	40	60	100
6	DCE551	Transportation Engineering Lab	-	-	4	2	50	50	100
7	DCE552	Surveying Lab – II	-	-	6	3	50	50	100
8	DCE553	Civil Engineering Drawing – II	-	-	6	3	50	50	100
9	DCE555	Industrial Training	-	-	-	4	50	50	100
Total			**14**	**8**	**16**	**30**	**400**	**500**	**900**

Semester- VI

S. No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	DCE608	Design of Reinforced Cement Concrete (RCC) Structure	3	2	-	4	40	60	100
2	DCE602	Design of Steel Structures	3	2	-	4	40	60	100
3	DCE603	Transportation Engineering – II	2	2	-	3	40	60	100
4	DCE604	Earthquake Engineering	2	2	-	3	40	60	100
5	DCE605	Estimating, Costing and Valuation	3	2	-	4	40	60	100
6	DIP604/ DIP603❖	Environment Studies /Industrial Ecology	4	-	-	4	40	60	100
7	DCE654	Reinforced Cement Concrete (RCC) Lab	-	-	6	3	50	50	100
8	DCE655	Design Project on CAD Lab	-	-	-	4	50	50	100
Total			**17**	**10**	**6**	**29**	**340**	**460**	**800**

❖ **Subject can be taught either in Vth or VIth Semester.**

APPLIED MATHEMATICS – I

First/Second Semester

Course Code: DIP111	**L**	**T**	**P**	**C**
Course Contents:	**3**	**2**	**-**	**4**

(A) Number system: Rational numbers, Laws of exponents for real numbers.

Polynomials: Polynomials of one variable, factorization of polynomials Algebraic identities.

L.C.M.: Prime factorization, L.C.M. of two numbers, L.C.M. of three numbers.

Linear equations in two variables: Graph of a linear equation in two variables, Equations of lines parallel to x axis and y axis.

(Foundation Course – Not for Grading) (Lectures 08)

Unit I

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

Binomial Theorem: For positive and negative index (without proof): To find general term, middle term, term independent of x, coefficient of x^r. **(Lectures 08)**

Unit II

Determinants: Elementary properties of determinants of order 2 and 3, Consistency of equations by Crammer's rule of non-homogeneous and homogeneous system of linear equations.

Vector Algebra: Definition and types of vectors, addition and subtraction of vectors. Dot and Cross product of two vectors, Scalar and vector triple products. **(Lectures 08)**

Unit III

Complex Numbers: Definition of complex number, conjugate of complex numbers, addition, subtraction, multiplication and division of complex numbers, rationalization, modulus and amplitude, polar form, square root, De Moivre's theorem (without proof) for positive, negative and fractional values. **(Lectures 08)**

Unit IV

Co-Ordinate Geometry (2- dimensional):

Parabola: Definition, Standard form, general equation (without proof).

Ellipse: Definition, Standard form, general equation (without proof).

Hyperbola: Definition, Standard form, general equation (without proof). **(Lectures 08)**

Unit V

Co-Ordinate Geometry (3- dimensional): The point in the space, direction ratios and direction cosines of a point.

Straight line: General equation, different forms of straight lines, angle between two lines, shortest distance.

Sphere: General equation, centre and radius of a sphere, equation of a sphere passing through three points, Equation of sphere whose ends of diameter are given. **(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. The project will be evaluated by the external examiner.

Text Books:

1. Luthra, H. R., Applied Mathematics-I, Bharat Bharati Prakashan & Co., Meerut.
2. Sinha Dr. K, Applied Mathematics-I, BBP Publications Pvt,Ltd., Meerut.

Reference Books:

1. Sharma, R D, Applied Mathematics, Dhanpat Rai Publications.
2. Grewal B S, Elementary Engineering Mathematics, Khanna Publication.

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

APPLIED PHYSICS
First/Second Semester

Course Code: DIP112/DIP202	**L**	**T**	**P**	**C**
Course Contents:	**3**	**2**	**-**	**4**

(A) Units and Dimensions: S.I. Units & Dimensions of physical quantities. Dimensional formula and dimensional equation. Principle of homogeneity of dimensions and applications of homogeneity principle to:

i) Checking the correctness of physical equations.
ii) Deriving relations among various physical quantities.
iii) Conversion of numerical values of physical quantities from one system of units into another.

Laws of Motions: Newton's Law of motion (First, Second & Third)**,** Rectilinear motion, Equations of motion. **(Foundation Course – Not for Grading) (Lectures 08)**

Unit I

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

Force and Motion: Parabolic motion, projectiles thrown horizontally and at an angle, Ordinary Problems on time of flight, horizontal range, and vertical height, Gravitational force, Kepler's laws, Elementary concept of Escape velocity and geostationary satellite.

(Lectures 08)

Unit II

Dynamics of Rigid Body (Rotational Motion): Rotational motion, Moment of inertia, Theorems of Perpendicular and Parallel axis of moment of inertia (Statement only), Radius of gyration, angular momentum, Conservation of angular momentum, Torque.

Friction: Introduction, Advantage and disadvantage of friction, Static and dynamic frictional forces. **(Lectures 08)**

Unit III

Elasticity: Elasticity, stress and strain, Hook's law, elastic limit, Modulus of elasticity- Young's modulus, bulk modulus and modulus of rigidity.

Simple Harmonic Motion: Periodic Motion, characteristics of simple harmonic motion; equation of S.H.M. and determination of velocity and acceleration, Simple pendulum and Derivation of theirperiodic time. **(Lectures 08)**

Unit IV

Application of Sound Waves:

Acoustics: Definition of pitch, loudness, quality and intensity of sound, Echo, reverberation and reverberation time.

Optics: Quantum nature of light, Coherence, Duality of wave and particle, Elementary Concept of Interference, diffraction and polarization; Brewster's law and Malus law.

(Lectures 08)

Unit V

Electrostatics: Electric Charges, Coulomb's law-force between two point charges, Electric field; electric field due to a point charge; Electric flux, statement of Gauss's theorem. Electric potential, potential difference, equi-potential surfaces.

Electrodynamics: Ohm's law, Limitations of Ohm's law, Ampere's Law, faraday's law, Biot- Savart's Law. **(Lectures 08)**

The question paper shall have weightage to numerical/ case study 30% and to theoretical 70%.

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 shouldbe 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 Tyagi, *Applied Physics,* Navbharti Prakashan, Meerut.
2. Kushwaha P. S., *Applied Physics,* Bharat Bharti Publications, Meerut.
3. Jain Vibha *Applied Physics,* Dhanpat Rai Publication., New Delhi.

Reference Books:

1. Gaur R.K. & Gupta S. L., *Engineering Physics,* Dhanpat Rai Publication., New Delhi.
2. Gaur R.K. & Gupta S. L., *Applied Physics,* Dhanpat Rai Publication., New Delhi.

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

APPLIED CHEMISTRY
First/Second Semester

Course Code: DIP113/DIP203	**L**	**T**	**P**	**C**
Course Contents:	**3**	**2**	**-**	**4**

(A) Chemical Substance: Solvent, solute, solution, reactant, reagent, product, Acids and Base, Basic concept of Acids and Bases, Periodic classification of elements.

(Foundation Course – Not for Grading) (Lectures 08)

Unit I

Atomic Structure: Basic concept of atomic structure, Matter wave concept, de Broglie wave equation, Quantum numbers, Heisenberg's Uncertainty Principle, Shapes of orbital.

Chemical Bonding: Overview of basic concept, Ionic, Co-valent and Co-ordination Bond, Hydrogen bonding. **(Lectures 08)**

Unit II

Electro Chemistry: Arrhenius's Theory of electrolytic dissociation, Concept of pH and it measurement by pH meter, Buffer solutions, Indicators, Solubility product, Common ion effect with their application, Redox reactions. **(Lectures 08)**

Unit III

Lubricants: Introduction, mechanism of lubrication, classification of lubricant, properties and testing of lubricating Oil Numerical problem based on testing methods.

Cement: Manufacture, IS code, Setting and hardening of cement, Portland cement Plaster of Paris. **(Lectures 08)**

Unit IV

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 an d foaming. Characteristics imparted by various impurities or contaminants such as colour, odour, taste and sediments and their analysis.

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. **(Lectures 08)**

Unit V

Polymers:

i) Introduction to basic terms used in polymer chemistry and technology. Monomers, types of polymer (no mechanism required).

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. **(Lectures 08)**

The question paper shall have weightage to numerical/ case study 30% and to theoretical 70%.

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 oneach 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.

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

BASICS OF ELECTRICAL AND CIVIL ENGINEERING

First/Second Semester

Course Code: DIP104/DIP204	L	T	P	C
Course Contents:	**4**	**-**	**-**	**4**

BASICS OF ELECTRICAL ENGINEERING

Unit I

Basic Concepts: Electric Charge, Current, Electromotive force, Resistance, Laws of resistance, Capacitance and Inductance, Electrical Power and Energy, Ohm's law, Series and Parallel connection of Resistances and capacitances. **(Lectures 08)**

Unit II

AC Fundamentals: Concept of alternating Voltage and current, Difference between AC and DC, Average Values and R.M.S. value, Form Factor and Peak factor of sinusoidal waveform, Alternating voltage applied to pure resistance, pure inductance, pure capacitance and their combinations. Kirchhoff's Laws and their applications, Concept of power and power factor in AC circuit. **(Lectures 08)**

Unit III

Electrical Safety & Troubleshooting: Electric Shock and precautions against it, Treatment of Electric shock, Concept of fuses and their classification, selection and application, Concept of Earthing and its types, MCBs and its application.

Basic Testing and faults diagnosis in electrical systems, replacement of different passive components e.g. fuses lamps and lamp holders, switches, cables. **(Lectures 08)**

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. **(Lectures 08)**

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. **(Lectures 08)**

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. **(Lectures 08)**

The question paper shall have weightage to numerical/ case study 30% and to theoretical 70%.

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. Thetopic 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, Muzaffarnagar.
2. Gupta D.V., *General Civil Engineering*, Asian Publishers, Muzaffarnagar.

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.

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

BASICS OF ELECTRONICS & MECHANICAL ENGINEERING

First/Second Semester

Course Code: DIP105/DIP205	**L**	**T**	**P**	**C**
Course Contents:	**4**	**-**	**-**	**4**

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. **(Lectures 08)**

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. **(Lectures 08)**

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, common base configurations (CB), common emitter configuration (CE), common collector configuration. **(Lectures08)**

BASICS OF MECHANICAL ENGINEERING

Unit IV

Sources of energy, Energy sources in nature, conventional and non-conventional energy sources. Fuels, their properties and classification.

Machine Components: Elementary idea of loading of machine components- pins, cotter and knuckle joints, types of keys, shafts, collars, cranks and eccentrics, couplings and clutches. **(Lectures 08)**

Unit V

Bearings: Use and types.

Lubrication: Types of lubrication systems, Selection of lubricants on the basis of their properties. **(Lectures 08)**

Unit VI

Power transmission: Gears- types of gears, gear trains and their applications. Belts, ropes, & chain drive (only difference).

Springs: Their types, use and material. **(Lectures 08)**

The question paper shall have weightage to numerical /case Study 20% and to theoretical 80%.

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 thefaculty 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. Thetopic 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, Nai Sadak, Delhi.

Reference Books:

1. R.S. Khurmi, *Machine Design*, Eurasian.

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

COMPUTER FUNDAMENTALS, INTERNET, & MS-OFFICE

First/Second Semester

Course Code: DIP131/DIP231	**L**	**T**	**P**	**C**
Course Contents:	**3**	**1**	**-**	**4**

Objective: To give the basic knowledge of Computer hardware, Internet and application software with DOS keys to the students.

Course Contents

Unit I:

Introduction and Definition of Computer: Computer Generation, Characteristics of Computer, Advantages and Limitations of a computer, Classification of computers, Functional components of a computer system (Input, CPU, Storage and Output Unit), Types of memory (Primary and Secondary) Memory Hierarchy. Hardware: a) Input Devices- Keyboard, Mouse, Scanner, Bar Code Reader b) Output Devices – Visual Display Unit (VDU), Printers, Plotters etc. Software: Introduction, types of software with examples, Introduction to languages, Compiler, Interpreter and Assembler. Number System: Decimal, Octal, Binary and Hexadecimal Conversions, BCD, ASCII and EBCDIC Codes.

(Lecture08)

Unit II:

MS – DOS: Getting Started on DOS with Booting the System, Internal Commands: CHDIR(CD),CLS, COPY, DATE, DEL(ERASE), DIR, CHARACTER, EXIT,MKDIR(MD), REM, RENAME(REN), RMDIR(RD), TIME, TYPE, VER, VOL, External Commands: ATTRIB, CHKDSK, COMMAND, DOSKEY, EDIT, FORMAT,HELP, LABEL, MORE, REPLACE, RESTORE, SORT, TREE, UNDELETE, UNFORMAT,XCOPY.

Introduction of Internet: History of internet, Web Browsers, Searching and Surfing, Creating an E-Mail account, sending and receiving E-Mails. **(Lecture 08)**

Unit III:

MS Word: Starting MS WORD, Creating and formatting a document, Changing fonts and point size, Table Creation and operations, Autocorrect, Auto text, spell Check, Word Art, Inserting objects, Page setup, Page Preview, Printing a document, Mail Merge.

(Lecture 08)

Unit IV:

MS Excel: Starting Excel, Work sheet, cell inserting Data into Rows/ Columns, Alignment, Text wrapping , Sorting data, Auto Sum, Use of functions, Cell Referencing form, Generating graphs, Worksheet data and charts with WORD, Creating Hyperlink to a WORD document, Page set up, Print Preview, Printing Worksheets.

(Lecture 08)

Unit V:

MS-POWERPOINT: Starting MS–Power Point,, Creating a presentation using auto content Wizard, Blank Presentation, creating, saving and printing a presentation, Adding a slide to presentation, Navigating through a presentation, slide sorter, slide show, editing slides, Using Clipart, Word art gallery, Adding Transition and Animation effects, setting timings for slide show, preparing note pages, preparing audience handouts, printing presentation documents.

(Lecture 08)

Course outcomes:

After studying this course, you should be able to:

- Understand the fundamental hardware components that make up a computer's hardware and the role of each of these components
- Understand the difference between an operating system and an application program, and what each is used for in a computer
- Describe some examples of computers and state the effect that the use of computer technology has had on some common products
- Be familiar with software applications
- Understand file management
- Accomplish creating basic documents, worksheets, presentations with their properties.
- Experience working with email and recognize email netiquette.

Text Books:

1. Sinha P.K., Computer Fundamentals, BPB Publishing.
2. Bill Bruck., The Essentials Office 2000 Book, BPB Publishing.
3. Leon A. & Leon M., Introductions to Computers, Vikas Publications.

Reference Books:

1. Peter Norton_s, Introductions to Computers, Tata McGraw Hill.
2. Price Michael, Office in Easy Steps, TMH Publication.

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

APPLIED MECHANICS
First/Second Semester

Course Code: DIP107/DIP207	**L**	**T**	**P**	**C**
Course Contents:	**3**	**1**	**-**	**4**

Unit I

Force Analysis: Introduction of Mechanics, System of forces, Equilibrium & resultant of forces, Principle of transmissibility, Law of parallelogram triangle of forces & polygon of forces, solution of simple engineering problems by analytical methods: Such as simple wall crane, jib crane etc, Determination of resultant of any number of forces in one plane acting upon a particle. **(Lectures 08)**

Unit II

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

Moment and Couple:

Definition of moment and its properties, generalized theorem of moments, Application to simple problem on levers-Bell crank Lever, compound lever, Moment of couple. Simple applied problem on moment of couple. **(Lectures 08)**

Unit III

Friction: Definition, Types, Laws of friction, Terms related to friction: coefficient of friction, angle of friction, angle of repose, cone of friction, Problems on equilibrium of a body resting on a rough inclined plane, Simple problems on friction, Conditions of sliding and toppling (without numerical). **(Lectures 08)**

Unit IV

Stress and strain: Concept of stress and strain, Types of stress and Strain, Definition: tension, compression, shear, bending and torsion, Concept of volumetric and lateral strain, Poisson's ratio. Ultimate stress, working stress, Elasticity, Hook's Law, Load deformation diagram for mild steel and cast iron, Modulus of elasticity, Yield point, Modulus of rigidity and Bulk modulus. **(Lectures 08)**

Unit V

Beam: Definition, Classification, calculation of reaction at the support of cantilever and simply supported beams (simple problem on point load).

Trusses: Definition, Classification, Analysis of trusses: Methods of joints (Simple problems only). **(Lectures 08)**

The question paper shall have weightage to numerical /case Study 50% and to theoretical 50%.

Project work

There will be a project work assigned to students by the subject faculty. It will be of 15 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty and 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.

Reference Books:

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

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

ENGLISH COMMUNICATION & SOFT SKILLS – I

(For All Undergraduate & Diploma Courses)

First Semester

Course Code-DIP199	**L**	**T**	**P**	**C**
Course Content	**3**	**0**	**2**	**4**

Objective: To comprehend and communicate in simple English

Module -1: Introduction to English language (6 Lectures)

a) Role and significance of English language in the present scenario.
b) English Language: Its relevance for the Indian industry.
c) Introduction to Listening, Speaking, Reading, Writing (LSRW) and benchmarking of the class.

[Note: As part of classroom activity, a guest lecture from an industry representative/ Principal (CRC) and maintaining progress card for each student on LSRW for future reference]

Module -2: Phonetics& Functional Grammar (14 Lectures)

a) Pronunciation and daily usage correction (speak with differences between p/b, s/sh, f/ph, t/d, v/w sounds).
b) Parts of speech, articles, tenses, verbs and modals.
c) Practice of daily use words, numerals and tongue twisters.
d) Vocabulary building, Construction of simple sentences: Basic sentence pattern, subject and Predicate.

[Note: As part of classroom activity, language games, tongue & jaw exercises, simple passages from the newspapers for oral drills in the classroom and practice tests (written and oral)]

Module -3: English Communication- About Myself (14 Lectures)

a) Let's talk, making conversation, meeting and greeting.
b) Introducing myself, my family and my friends.
c) My opinions, my likes and dislikes.
d) Life at college, hostel and workplace.

[Note: As part of classroom activity, use the Workbook for reference for classroom and home assignments; carry out practice tests (written and oral)]

Module -4:Personality Development-I (8 Lectures)

a) First impression: Dressing sense, good manners, speaking well and respectably.
b) Positive Attitude: Being happy and alert, a good listener and a good friend.
c) Consultation among peers: Soliciting advice and giving advice.
d) Goal setting, confidence building& handling rejection.

[Note: As part of classroom activity, refer Workbook for classroom and home assignments, carry out practice tests (written and oral)]

First Semester Outcome:

1. Students will realise the significance of English for their career progression.
2. Benchmarking the students in the first semester to observe their progression in terms of LSRW.
3. Students will be able to understand distinct sounds and improve pronunciation.
4. Students will improve their English vocabulary of daily usage.
5. Students will be able to form simple sentences to talk about themselves, friends and relatives.
6. Students will be able to imbibe the pre-requisites of personality development.

Evaluation& Assessment: Students will be evaluated on all the four parameters of LSRW

External Exam	*Internal Assessment*	*Total*
50	50	100

Internal Assessment: 50

Best 2 out of Three CTs	*Attendance*	*Workbook Assignments& Viva*	*Total*
20	10	10+10	50

Viva to be carried out by external English faculty from within the university

External Assessment: 50

PRACTICAL EXAM*	VIVA	TOTAL
25 Marks	25 Marks	50 Marks

(The external evaluation would be done by an external examiner based on the Practical Exam and viva conducted during the examination. External examiner will be the English faculty from within the university)

*** Practical Exam Paper Structure: (One Hour Duration)**
Question paper should consist of four questions out of which the first question will be objective type of 10 marks. Other three question will be long, each of 05 marks.

Reference Books:

1. ILFS Bi-lingual Course in Basic English, ILFS Skill Development Corporation.
2. English Grammar Composition & Usage by J.C. Nesfield, Macmillan Publishers.
3. The Business letters by Madan Sood, Goodwill Publishing House, New Delhi.
4. Communication Skills by Sanjay Kumar & PushpLata, Oxford University Press.

PHYSICS LAB
First/Second Semester

Course Code: DIP181/DIP251

L	T	P	C
-	-	3	2

LIST OF EXPERIMENTS:

2. To find the diameter of wire using a screw gauge.
3. To find volume of solid cylinder and hollow cylinder using a Vernier caliper.
4. To determine the radius of curvature of a concave surface using a spherometer.
5. To verify the parallelogram law of forces.
6. To determine the value of 'g' by simple pendulum.
7. To verify Hooks law.

Evaluation of Practical Examination:

Internal Evaluation (50 marks):

Each sheet prepared would be evaluated by the faculty concerned on the date of preparing the sheet on a 5 point which would include the sheet drawn by the students and a Viva Voce taken by the faculty concerned. The marks shall be entered on the index sheet.

Evaluation Scheme:

EXPERIMENT (30 MARKS)	ATTENDANCE (10 MARKS)	VIVA (10MARKS)	TOTAL INTERNAL (50 MARKS)

External Evaluation (50 marks):

The external evaluation would also be done by the external examiner based on the experiment conducted during the examination:

EXPERIMENT (30 MARKS)	FILE WORK (10 MARKS)	VIVA (10MARKS)	TOTAL EXTERNAL (50 MARKS)

CHEMISTRY LAB
First/Second Semester

Course Code: DIP182/DIP252

L	T	P	C
-	-	3	2

LIST OF EXPERIMENTS:

1. To determine the total hardness of water sample in terms of $CaCO_3$ by EDTA titration method using EBT indicator.
2. To determine the percentage of available Chlorine in the supplied sample of Bleaching powder.
3. To determine the alkalinity in the given water sample.
4. To determine the pH of the given water sample.
5. To determine the chloride content in given water sample.

Evaluation of Practical Examination:

Internal Evaluation (50 marks):

Each sheet prepared would be evaluated by the faculty concerned on the date of preparing the sheet on a 5 point which would include the sheet drawn by the students and a Viva Voce taken by the faculty concerned. The marks shall be entered on the index sheet.

Evaluation Scheme:

EXPERIMENT (30 MARKS)	ATTENDANCE (10 MARKS)	VIVA (10MARKS)	TOTAL INTERNAL (50 MARKS)

External Evaluation (50 marks):

The external evaluation would also be done by the external examiner based on the experiment conducted during the examination:

EXPERIMENT (30 MARKS)	FILE WORK (10 MARKS)	VIVA (10MARKS)	TOTAL EXTERNAL (50 MARKS)

ELECTRICAL ENGINEERING LAB

First/Second Semester

Course Code: DIP153/DIP253	**L**	**T**	**P**	**C**
	-	**-**	**3**	**2**

LIST OF EXPERIMENTS:

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. 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.
4. Verification of Kirchhoff's current Law applied to D.C. circuit.
5. Verification of Kirchhoff's Voltage Law applied to D.C. circuit.
6. To observe the A.C. and D.C. wave shape on C.R.O.

Evaluation of Practical Examination:

Internal Evaluation (50 marks):

Each sheet prepared would be evaluated by the faculty concerned on the date of preparing the sheet on a 5 point which would include the sheet drawn by the students and a Viva Voce taken by the faculty concerned. The marks shall be entered on the index sheet.

Evaluation Scheme:

EXPERIMENT (30 MARKS)	ATTENDANCE (10 MARKS)	VIVA (10MARKS)	TOTAL INTERNAL (50 MARKS)

External Evaluation (50 marks):

The external evaluation would also be done by the external examiner based on the experiment conducted during the examination:

EXPERIMENT (30 MARKS)	FILE WORK (10 MARKS)	VIVA (10MARKS)	TOTAL EXTERNAL (50 MARKS)

ELECTRONICS ENGINEERING LAB

First/Second Semester

Course Code: DIP154/DIP254	**L**	**T**	**P**	**C**
	-	**-**	**3**	**2**

LIST OF EXPERIMENTS:

1. To study, Identification & testing of passive Components, Resistor Compactor.
2. To draw the V-I characteristics of P-N Junction Diode in forward and reverse Bias -

   i) Silicon
   ii) Germanium
3. To draw the input and output wave form of half wave rectifier using semiconductor diode.
4. To draw the input and output wave form of full wave rectifier using semi conductor diode.
5. To draw input and output characteristics of Transistor in common base configuration.
6. To draw the V-I characteristics of Zener diode.

Evaluation of Practical Examination:

Internal Evaluation (50 marks):

Each sheet prepared would be evaluated by the faculty concerned on the date of preparing the sheet on a 5 point which would include the sheet drawn by the students and a Viva Voce taken by the faculty concerned. The marks shall be entered on the index sheet.

Evaluation Scheme:

EXPERIMENT (30 MARKS)	ATTENDANCE (10 MARKS)	VIVA (10MARKS)	TOTAL INTERNAL (50 MARKS)

External Evaluation (50 marks):

The external evaluation would also be done by the external examiner based on the experiment conducted during the examination:

EXPERIMENT (30 MARKS)	FILE WORK (10 MARKS)	VIVA (10MARKS)	TOTAL EXTERNAL (50 MARKS)

INFORMATION TECHNOLOGY LAB

First/Second Semester

Course Code: DIP155/DIP255	**L**	**T**	**P**	**C**
	-	**-**	**3**	**2**

LIST OF EXPERIMENTS:

1. Create a document, using functions: Save as, Page number, Insert Bullets and Numbering.
2. Create a document, using different font's size, font's type and font's color.
3. Create a document, using the function page preview, page color, page border, page no. then print that document
4. Create a document, using function styles and formatting options with Page Set up.
5. Create a document and insert the Table, Image and Word art gallery.
6. Create a table and chart in excel and implement all formula as addition, subtraction, multiplication and division.
7. Create a Power point presentation, Save & print the power point using slide designing.
8. Create a Power point presentation using clipart, Word art gallery & Add transition & Animation effects.
9. Create a Web Page using basic HTML Tags.
10. Create a Tree Structure using basic DOS Commands.

Evaluation of Practical Examination:

Internal Evaluation (50 marks):

Each sheet prepared would be evaluated by the faculty concerned on the date of preparing the sheet on a 5 point which would include the sheet drawn by the students and a Viva Voce taken by the faculty concerned. The marks shall be entered on the index sheet.

Evaluation Scheme:

EXPERIMENT (30 MARKS)	ATTENDANCE (10 MARKS)	VIVA (10MARKS)	TOTAL INTERNAL (50 MARKS)

External Evaluation (50 marks):

The external evaluation would also be done by the external examiner based on the experiment conducted during the examination:

EXPERIMENT (30 MARKS)	FILE WORK (10 MARKS)	VIVA (10MARKS)	TOTAL EXTERNAL (50 MARKS)

APPLIED MECHANICS LAB

First/Second Semester

Course Code: DIP156/DIP256	**L**	**T**	**P**	**C**
	-	**-**	**3**	**2**

LIST OF EXPERIMENTS:

1. To verify the law of Polygon of forces.
2. To verify the law of parallelogram
3. To verify the triangle of forces.
4. To verify the law of principle of moments.
5. To find the coefficient of friction between wood and steel.
6. To find the reaction at supports of a simply supported beam carrying point loads only.
7. To find the forces in the jib & tie of a jib crane.

Evaluation of Practical Examination:

Internal Evaluation (50 marks):

Each sheet prepared would be evaluated by the faculty concerned on the date of preparing the sheet on a 5 point which would include the sheet drawn by the students and a Viva Voce taken by the faculty concerned. The marks shall be entered on the index sheet.

Evaluation Scheme:

EXPERIMENT (30 MARKS)	ATTENDANCE (10 MARKS)	VIVA (10MARKS)	TOTAL INTERNAL (50 MARKS)

External Evaluation (50 marks):

The external evaluation would also be done by the external examiner based on the experiment conducted during the examination:

EXPERIMENT (30 MARKS)	FILE WORK (10 MARKS)	VIVA (10MARKS)	TOTAL EXTERNAL (50 MARKS)

WORKSHOP PRACTICE

First/Second Semester

Course Code: DIP187/DIP257

L	T	P	C
-	-	6	3

LIST OF EXPERIMENTS:

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 article such as wooden-picture frame, hanger, peg, name plates etc.
2. **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.
3. **Welding Shop:**
   - **Ex-1** Study of Gas and Electric arc welding methods.
   - **Ex-2** Welding of a 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.
4. **Machine Shop:**
   - **Ex-1** Study of Lathe machine.
   - **Ex-2** Plane and step turning & knurling practice on a lathe machine.
   - **Ex-3** Study & sketch of planning machine and plane a rectangle of cast iron.

Evaluation of Practical Examination:

Internal Evaluation (50 marks):

Each sheet prepared would be evaluated by the faculty concerned on the date of preparing the sheet on a 5 point which would include the sheet drawn by the students and a Viva Voce taken by the faculty concerned. The marks shall be entered on the index sheet.

Evaluation Scheme:

EXPERIMENT (30 MARKS)	ATTENDANCE (10 MARKS)	VIVA (10MARKS)	TOTAL INTERNAL (50 MARKS)

External Evaluation (50 marks):

The external evaluation would also be done by the external examiner based on the experiment conducted during the examination:

EXPERIMENT (30 MARKS)	FILE WORK (10 MARKS)	VIVA (10MARKS)	TOTAL EXTERNAL (50 MARKS)

ENGINEERING DRAWING

First/Second Semester

Course Code: DIP188/DIP258	**L**	**T**	**P**	**C**
	-	**-**	**6**	**3**

LIST OF EXPERIMENTS:

1. Drawing, instruments and their uses.

(a) Introduction to various drawing, instruments.
(b) Correct use and care of Instruments.
(c) Sizes of drawing sheets and their layouts.

2. (a) Lettering Technique: Printing of vertical and inclined normal single stroke capital letters and numbers.

(b) Conventional Representation: Types of lines, Conventional representation of materials. **(1 Sheet)**

3. Introduction to Scales: Necessity and use, R F; Types of scales used in general in engineering drawing, plane, diagonal and chord scales. **(1 Sheet)**

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
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. **(2 Sheet)**

6. Section of Solids: 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. **(1 Sheet)**

7. Development of Surfaces: Parallel line and redial line methods of development; Development of simple and truncated surfaces (Cube, prism, cylinder, cone and pyramid). **(1 Sheet)**

8. Isometric Projection: Isometric scale; Isometric Projection of solids. **(1 Sheet)**

9. Orthographic Projection: Nut and Bolt, Rivets and Riveted Joints. **(1 Sheet)**

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, Meerut.
3. Goyal B.K., *Engineering Drawing*, Asian Publishers, Muzaffarnagar.

Reference Books:

1. Gill P.S., *Machine Drawing*, S.K. Kataria & Sons, Delhi

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

Evaluation of Practical Examination:

Internal Evaluation (50 marks):

Each sheet prepared would be evaluated by the faculty concerned on the date of preparing the sheet on a 5 point which would include the sheet drawn by the students and a Viva Voce taken by the faculty concerned. The marks shall be entered on the index sheet.

Evaluation Scheme:

EXPERIMENT (30 MARKS)	ATTENDANCE (10 MARKS)	VIVA (10MARKS)	TOTAL INTERNAL (50 MARKS)

External Evaluation (50 marks):

The external evaluation would also be done by the external examiner based on the experiment conducted during the examination:

EXPERIMENT (30 MARKS)	FILE WORK (10 MARKS)	VIVA (10MARKS)	TOTAL EXTERNAL (50 MARKS)

APPLIED MATHEMATICS – II

Second/First Semester

CourseCode: DIP201	L	T	P	C
Course Contents:	**3**	**2**	**-**	**4**

Unit I

Function: Definition of function with examples, different types of functions and domain & range of algebraic function. Limits (left hand limit, right hand limit) of functions. Continuity of functions, elementary test for continuity of functions, Differentiability of functions, elementary test for differentiability of functions. **(Lectures 08)**

Unit II

Differential Calculus: Definition of derivative, elementary formulae of differentiation, product rule, division rule, Methods of finding derivative - function of a function, logarithmic differentiation, differentiation of implicit functions, differentiation of parametric functions, higher order differentiation (upto3^{rd} order). **(Lectures 08)**

Unit III

Application of Differentiation: Finding increasing/decreasing functions, velocity, acceleration with the help of differentiation, Finding tangent and normal to the different curves. Maxima and Minima of a simple function (One variable). **(Lectures 08)**

Unit IV

Integral Calculus: Definition of integration, elementary formulae of integration. Methods of Integration: Integration by substitution, by parts and by partial fraction, definite integration and its properties, evaluation of definite integrals. **(Lectures 08)**

Unit V

Application of Integration: Length of simple curves, finding areas bounded by simple curves, Simpson's $1/3^{rd}$, Simpson's $3/8^{th}$ and Trapezoidal Rule: their application in simple cases (algebraicfunction only). **(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 shouldbe related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

Text Books:

1. Luthra, H. R., Applied Mathematics-I, Bharat Bharati Prakashan & Co., Meerut.
2. Sinha Dr. K, *Applied Mathematics-I*, BBP Publications Pvt, Ltd., Meerut.

Reference Books:

1. *Sharma, R D, Applied Mathematics, Dhanpat Rai Publications.*
2. *Grewal B S, Elementary Engineering Mathematics, Khanna Publication.*

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

APPLIED CHEMISTRY
Second/First Semester

Course Code: DIP203/DIP113	**L**	**T**	**P**	**C**
Course Contents:	**3**	**2**	**-**	**4**

(A) Chemical Substance: Solvent, solute, solution, reactant, reagent, product, Acids and Base: Basic concept of Acids and Bases; Periodic classification of elements.

(Foundation Course – Not for Grading) (Lectures 08)

Unit I

Atomic Structure: Basic concept of atomic structure, Matter wave concept, de Broglie wave equation, Quantum numbers, Heisenberg's Uncertainty Principle, Shapes of orbital.

Chemical Bonding: Overview of basic concept, Ionic, Co-valent and Co-ordination Bond, Hydrogen bonding. **(Lectures 08)**

Unit II

Electro Chemistry: Arrhenius's Theory of electrolytic dissociation, Concept of pH and it measurement by pH meter, Buffer solutions, Indicators, Solubility product, Common ion effect with their application, Redox reactions. **(Lectures 08)**

Unit III

Lubricants: Introduction, mechanism of lubrication, classification of lubricant, properties and testing of lubricating Oil Numerical problem based on testing methods.

Cement: Manufacture, IS code, Setting and hardening of cement, Portland cement Plaster of Paris. **(Lectures 08)**

Unit IV

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.

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. **(Lectures 08)**

Unit V

Polymers:

1. Introduction to basic terms used in polymer chemistry and technology. Monomers, types of polymer (no mechanism required).
2. 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. **(Lectures 08)**

The question paper shall have weightage to numerical/ case study 30% and to theoretical 70%.

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 oneach 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.

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

APPLIED PHYSICS
Second/First Semester

Course Code: DIP202/DIP112	**L**	**T**	**P**	**C**
Course Contents:	**3**	**2**	**-**	**4**

(B) Units and Dimensions: S.I. Units & Dimensions of physical quantities. Dimensional formula and dimensional equation. Principle of homogeneity of dimensions and applications of homogeneity principle to:

i) Checking the correctness of physical equations.
ii) Deriving relations among various physical quantities.
iii) Conversion of numerical values of physical quantities from one system of units into another.

Laws of Motions: Newton's Law of motion (First, Second & Third)**,** Rectilinear motion, Equations of motion. **(Foundation Course – Not for Grading) (Lectures 08)**

Unit I

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

Force and Motion: Parabolic motion, projectiles thrown horizontally and at an angle, Ordinary Problems on time of flight, horizontal range, and vertical height, Gravitational force, Kepler's laws, Elementary concept of Escape velocity and geostationary satellite.

(Lectures 08)

Unit II

Dynamics of Rigid Body (Rotational Motion): Rotational motion, Moment of inertia, Theorems of Perpendicular and Parallel axis of moment of inertia (Statement only), Radius of gyration, angular momentum, Conservation of angular momentum, Torque.

Friction: Introduction, Advantage and disadvantage of friction, Static and dynamic frictional forces. **(Lectures 08)**

Unit III

Elasticity: Elasticity, stress and strain, Hook's law, elastic limit, Modulus of elasticity- Young's modulus, bulk modulus and modulus of rigidity.

Simple Harmonic Motion: Periodic Motion, characteristics of simple harmonic motion; equation of S.H.M. and determination of velocity and acceleration, Simple pendulum and Derivation of theirperiodic time. **(Lectures 08)**

Unit IV

Application of Sound Waves:

Acoustics: Definition of pitch, loudness, quality and intensity of sound, Echo, reverberation and reverberation time.

Optics: Quantum nature of light, Coherence, Duality of wave and particle, Elementary Concept of Interference, diffraction and polarization; Brewster's law and Malus law.

(Lectures 08)

Unit V

Electrostatics: Electric Charges, Coulomb's law-force between two point charges, Electric field; Electric field due to a point charge; Electric flux, statement of Gauss's theorem. Electric potential, potential difference, equi-potential surfaces.

Electrodynamics: Ohm's law, Limitations of Ohm's law, Ampere's Law, faraday's law, Biot- Savart's Law. **(Lectures 08)**

The question paper shall have weightage to numerical/ case study 30% and to theoretical 70%.

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 shouldbe 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 Tyagi, *Applied Physics,* Navbharti Prakashan, Meerut.
2. Kushwaha P. S., *Applied Physics,* Bharat Bharti Publications, Meerut.
3. Jain Vibha, *Applied Physics,* Dhanpat Rai Publication., New Delhi.

Reference Books:

1. Gaur R.K. & Gupta S. L., *Engineering Physics,* Dhanpat Rai Publication., New Delhi.
2. Gaur R.K. & Gupta S. L., *Applied Physics,* Dhanpat Rai Publication., New Delhi.

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

BASICS OF ELECTRONICS & MECHANICAL ENGINEERING

Second/First Semester

Course Code: DIP205/DIP105	**L**	**T**	**P**	**C**
Course Contents:	**4**	**-**	**-**	**4**

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. **(Lectures 08)**

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. **(Lectures 08)**

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, common base configurations (CB), common emitter configuration (CE), common collector configuration. **(Lectures08)**

BASICS OF MECHANICAL ENGINEERING

Unit IV

Sources of energy, Energy sources in nature, conventional and non-conventional energy sources. Fuels, their properties and classification.

Machine Components: Elementary idea of loading of machine components- pins, cotter and knuckle joints, types of keys, shafts, collars, cranks and eccentrics, couplings and clutches. **(Lectures 08)**

Unit V

Bearings: Use and types.

Lubrication: Types of lubrication systems, Selection of lubricants on the basis of their properties. **(Lectures 08)**

Unit VI

Power transmission: Gears- types of gears, gear trains and their applications. Belts, ropes, & chain drive (only difference).

Springs: Their types, use and material. **(Lectures 08)**

The question paper shall have weightage to numerical /case Study 20% and to theoretical 80%.

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 shouldbe 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, Nai Sadak, Delhi.

Reference Books:

1. R.S. Khurmi, *Machine Design*, Eurasian.

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

BASICS OF ELECTRICAL AND CIVIL ENGINEERING

Second/First Semester

Course Code: DIP204/DIP104	**L**	**T**	**P**	**C**
Course Contents:	**4**	**-**	**-**	**4**

BASICS OF ELECTRICAL ENGINEERING

Unit I

Basic Concepts: Electric Charge, Current, Electromotive force, Resistance, Laws of resistance, Capacitance and Inductance, Electrical Power and Energy, Ohm's law, Series and Parallel connection of Resistances and capacitances. **(Lectures 08)**

Unit II

AC Fundamentals: Concept of alternating Voltage and current, Difference between AC and DC, Average Values and R.M.S. value, Form Factor and Peak factor of sinusoidal waveform. Alternating voltage applied to pure resistance, pure inductance, pure capacitance and their combinations. Kirchhoff's Laws and their applications, Concept of power and power factor in AC circuit. **(Lectures 08)**

Unit III

Electrical Safety & Troubleshooting: Electric Shock and precautions against it, Treatment of Electric shock, Concept of fuses and their classification, selection and application, Concept of Earthing and its types, MCBs and its application.

Basic Testing and faults diagnosis in electrical systems, replacement of different passive components e.g. fuses lamps and lamp holders, switches, cables. **(Lectures 08)**

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. **(Lectures 08)**

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. **(Lectures 08)**

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. **(Lectures 08)**

The question paper shall have weightage to numerical/ case study 30% and to theoretical 70%.

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 shouldbe 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, Muzaffarnagar.
2. Gupta D.V., *General Civil Engineering*, Asian Publishers, Muzaffarnagar.

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.

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

APPLIED MECHANICS
Second/First Semester

Course Code: DIP207/DIP107	**L**	**T**	**P**	**C**
Course Contents:	**3**	**1**	**-**	**4**

Unit I

Force Analysis: Introduction of Mechanics, System of forces, Equilibrium & resultant of forces, Principle of transmissibility, Law of parallelogram triangle of forces & polygon of forces, solution of simple engineering problems by analytical methods: Such as simple wall crane, jib crane etc, Determination of resultant of any number of forces in one plane acting upon a particle. **(Lectures 08)**

Unit II

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

Moment and Couple:

Definition of moment and its properties, generalized theorem of moments, Application to simple problem on levers-Bell crank Lever, compound lever, Moment of couple. Simple applied problem on moment of couple. **(Lectures 08)**

Unit III

Friction: Definition, Types, Laws of friction, Terms related to friction: coefficient of friction, angle of friction, angle of repose, cone of friction, Problems on equilibrium of a body resting on a rough inclined plane, Simple problems on friction, Conditions of sliding and toppling (without numerical). **(Lectures 08)**

Unit IV

Stress and strain: Concept of stress and strain, Types of stress and Strain, Definition: tension, compression, shear, bending and torsion, Concept of volumetric and lateral strain, Poisson's ratio. Ultimate stress, working stress, Elasticity, Hook's Law, Load deformation diagram for mild steel and cast iron, Modulus of elasticity, Yield point, Modulus of rigidity and Bulk modulus. **(Lectures 08)**

Unit V

Beam: Definition, Classification, calculation of reaction at the support of cantilever and simply supported beams (simple problem on point load).

Trusses: Definition, Classification, Analysis of trusses: Methods of joints (Simple problems only). **(Lectures 08)**

The question paper shall have weightage to numerical /case Study 50% and to theoretical 50%.

Project work

There will be a project work assigned to students by the subject faculty. It will be of 15 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty and 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.

Reference Books:

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

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

COMPUTER FUNDAMENTALS, INTERNET, & MS-OFFICE

Second/First Semester

Course Code: DIP231/DIP131	**L**	**T**	**P**	**C**
Course Contents:	**3**	**1**	**-**	**4**

Objective: To give the basic knowledge of Computer hardware, Internet and application software with DOS keys to the students.

Course Contents

Unit I:

Introduction and Definition of Computer: Computer Generation, Characteristics of Computer, Advantages and Limitations of a computer, Classification of computers, Functional components of a computer system (Input, CPU, Storage and Output Unit), Types of memory (Primary and Secondary) Memory Hierarchy. Hardware: a) Input Devices- Keyboard, Mouse, Scanner, Bar Code Reader b) Output Devices – Visual Display Unit (VDU), Printers, Plotters etc. Software: Introduction, types of software with examples, Introduction to languages, Compiler, Interpreter and Assembler. Number System: Decimal, Octal, Binary and Hexadecimal Conversions, BCD, ASCII and EBCDIC Codes.

(Lecture08)

Unit II:

MS – DOS: Getting Started on DOS with Booting the System, Internal Commands: CHDIR(CD),CLS, COPY, DATE, DEL(ERASE), DIR, CHARACTER, EXIT,MKDIR(MD), REM, RENAME(REN), RMDIR(RD), TIME, TYPE, VER, VOL, External Commands: ATTRIB, CHKDSK, COMMAND, DOSKEY, EDIT, FORMAT,HELP, LABEL, MORE, REPLACE, RESTORE, SORT, TREE, UNDELETE, UNFORMAT,XCOPY.

Introduction of Internet: History of internet, Web Browsers, Searching and Surfing, Creating an E-Mail account, sending and receiving E-Mails. **(Lecture 08)**

Unit III:

MS Word: Starting MS WORD, Creating and formatting a document, Changing fonts and point size, Table Creation and operations, Autocorrect, Auto text, spell Check, Word Art, Inserting objects, Page setup, Page Preview, Printing a document, Mail Merge.

(Lecture 08)

Unit IV:

MS Excel: Starting Excel, Work sheet, cell inserting Data into Rows/ Columns, Alignment, Text wrapping , Sorting data, Auto Sum, Use of functions, Cell Referencing form, Generating graphs, Worksheet data and charts with WORD, Creating Hyperlink to a WORD document, Page set up, Print Preview, Printing Worksheets. **(Lecture 08)**

Unit V:

MS-POWERPOINT: Starting MS–Power Point,, Creating a presentation using auto content Wizard, Blank Presentation, creating, saving and printing a presentation, Adding a slide to presentation, Navigating through a presentation, slide sorter, slide show, editing slides, Using Clipart, Word art gallery, Adding Transition and Animation effects, setting timings for slide show, preparing note pages, preparing audience handouts, printing presentation documents.

(Lecture 08)

Course outcomes:

After studying this course, you should be able to:

- Understand the fundamental hardware components that make up a computer's hardware and the role of each of these components

- Understand the difference between an operating system and an application program, and what each is used for in a computer
- Describe some examples of computers and state the effect that the use of computer technology has had on some common products
- Be familiar with software applications
- Understand file management
- Accomplish creating basic documents, worksheets, presentations with their properties.
- Experience working with email and recognize email netiquette.

Text Books:

1. Sinha P.K., Computer Fundamentals, BPB Publishing.
2. Bill Bruck., The Essentials Office 2000 Book, BPB Publishing.
3. Leon A. & Leon M., Introductions to Computers, Vikas Publications.

Reference Books:

1. Peter Norton_s, Introductions to Computers, Tata McGraw Hill.
2. Price Michael, Office in Easy Steps, TMH Publication.

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

ENGLISH COMMUNICATION & SOFT SKILLS – II

(For All Undergraduate & Diploma Courses)

Second Semester

Course Code-DIP299	**L**	**T**	**P**	**C**
Course Content	**3**	**0**	**2**	**4**

Objective: To build vocabulary, make simple sentences and communicate freely in simple English and overall professional development

Module -1: Basic Communication & Soft Skills (6 Lectures)

a) Reading comprehension.
b) Building conversational skills.
c) Verbal & Non-verbal communication.
[Note: As part of classroom activity, review and recap the last semester and carry out (Oral and written) practice test to update the progress card of each student, refer to the Workbook]

Module -2: Vocabulary: Building Blocks (10 Lectures)

a) Word Formation: Prefix, suffix, conversion and compounding.
b) Homophones and one-word substitution.
c) Words often confused and misused.
d) Idiomatic phrase, Antonyms and Synonyms.
[Note: As part of classroom activity, organise and learning language games, initiate the learning of 5 new words per class]

Module-3: English Communication: World around Me (12 Lectures)

a) Market Place, Bus Stop, Bank, Post Office.
b) Village, Town and City.
c) Eating out: Stall, Dhaba and Restaurant.
[Note: As part of classroom activity, refer Workbook for classroom and home assignments, carry out practice tests (written and oral)]

Module -4: Personality Development-II (12 Lectures)

a) Etiquettes: Telephone, e-mail and at a wedding or social gathering.
b) Public dealing: Making enquiries and requesting for help, handling difference of opinion, giving directions, instructions and getting assistance.
c) Expressions: Giving compliments, making complaints, Feeling sorry and saying thank you.
d) Entertainment: Radio, music, television, and computers.
[Note: As part of classroom activity, refer Workbook for classroom and home assignments, carry out practice tests (written and oral)]

Second Semester Outcome:

1. Gradual but significant improvement in student's progression in terms of LSRW to be noted.
2. Students will improve their English vocabulary of daily usage.
3. Students will be able to understand the world around them and communicate in diverse situations.

4. Students will be able to imbibe the requisites of personality development for demonstrating good manners in society.
5. Students will be able to exhibit basic etiquettes of personal communication.

Evaluation & Assessment: Students will be evaluated on all the four parameters of LSRW

External Exam	*Internal Assessment*	*Total*
50	50	100

Internal Assessment: 50

Best 2 out of Three CTs	*Attendance*	*Workbook Assignments & Viva*	*Total*
20	10	10+10	50

Viva to be carried out by external English faculty from within the university

External Assessment: 50

PRACTICAL EXAM*	VIVA	TOTAL
25 Marks	25 Marks	50 Marks

(The external evaluation would be done by an external examiner based on the PracticalExam and viva conducted during the examination. External examiner will be the English faculty from within the university)

*** Practical Exam Paper Structure: (One Hour Duration)**
Question paper should consist of four questions out of which the first question will be objective type of 10 marks. Other three question will be long, each of 05 marks.

Reference Books:

1. ILFS Bi-lingual Course in Basic English, ILFS Skill Development Corporation.
2. English Grammar Composition & Usage by J.C. Nesfield, Macmillan Publishers.
3. The Business letters by Madan Sood, Goodwill Publishing House, New Delhi.
4. Communication Skills by Sanjay Kumar & Pushp Lata, Oxford University Press.
5. Newspapers.

CHEMISTRY LAB
Second/First Semester

Course Code: DIP252/DIP182

L	T	P	C
-	-	3	2

LIST OF EXPERIMENTS:

1. To determine the total hardness of water sample in terms of $CaCO_3$ by EDTA titration method using EBT indicator.
2. To determine the percentage of available Chlorine in the supplied sample of Bleaching powder.
3. To determine the alkalinity in the given water sample.
4. To determine the pH of the given water sample.
5. To determine the chloride content in given water sample.

Evaluation of Practical Examination:

Internal Evaluation (50 marks):

Each sheet prepared would be evaluated by the faculty concerned on the date of preparing the sheet on a 5 point which would include the sheet drawn by the students and a Viva Voce taken by the faculty concerned. The marks shall be entered on the index sheet.

Evaluation Scheme:

EXPERIMENT (30 MARKS)	ATTENDANCE (10 MARKS)	VIVA (10MARKS)	TOTAL INTERNAL (50 MARKS)

External Evaluation (50 marks):

The external evaluation would also be done by the external examiner based on the experiment conducted during the examination:

EXPERIMENT (30 MARKS)	FILE WORK (10 MARKS)	VIVA (10MARKS)	TOTAL EXTERNAL (50 MARKS)

PHYSICS LAB
Second/First Semester

Course Code: DIP251/DIP181

L	T	P	C
-	-	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 radius of curvature of a concave surface using a spherometer.
4. To verify the parallelogram law of forces.
5. To determine the value of 'g' by simple pendulum.
6. To verify Hooks law.

Evaluation of Practical Examination:

Internal Evaluation (50 marks):

Each sheet prepared would be evaluated by the faculty concerned on the date of preparing the sheet on a 5 point which would include the sheet drawn by the students and a Viva Voce taken by the faculty concerned. The marks shall be entered on the index sheet.

Evaluation Scheme:

EXPERIMENT (30 MARKS)	ATTENDANCE (10 MARKS)	VIVA (10MARKS)	TOTAL INTERNAL (50 MARKS)

External Evaluation (50 marks):

The external evaluation would also be done by the external examiner based on the experiment conducted during the examination:

EXPERIMENT (30 MARKS)	FILE WORK (10 MARKS)	VIVA (10MARKS)	TOTAL EXTERNAL (50 MARKS)

ELECTRONICS ENGINEERING LAB

Second/First Semester

Course Code: DIP254/DIP154	**L**	**T**	**P**	**C**
	-	**-**	**3**	**2**

LIST OF EXPERIMENTS:

1. To study, Identification & testing of passive Components, Resistor Compactor.
2. To draw the V-I characteristics of P-N Junction Diode in forward and reverse Bias -

   i) Silicon.

   ii) Germanium.
3. To draw the input and output wave form of half wave rectifier using semi conductor diode.
4. To draw the input and output wave form of full wave rectifier using semi conductor diode.
5. To draw input and output characteristics of Transistor in common base configuration.
6. To draw the V-I characteristics of Zener diode.

Evaluation of Practical Examination:

Internal Evaluation (50 marks):

Each sheet prepared would be evaluated by the faculty concerned on the date of preparing the sheet on a 5 point which would include the sheet drawn by the students and a Viva Voce taken by the faculty concerned. The marks shall be entered on the index sheet.

Evaluation Scheme:

EXPERIMENT (30 MARKS)	ATTENDANCE (10 MARKS)	VIVA (10MARKS)	TOTAL INTERNAL (50 MARKS)

External Evaluation (50 marks)

The external evaluation would also be done by the external examiner based on the experiment conducted during the examination:

EXPERIMENT (30 MARKS)	FILE WORK (10 MARKS)	VIVA (10MARKS)	TOTAL EXTERNAL (50 MARKS)

ELECTRICAL ENGINEERING LAB

Second/First Semester

Course Code: DIP253/DIP153	**L**	**T**	**P**	**C**
	-	**-**	**3**	**2**

LIST OF EXPERIMENTS:

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. 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.
4. Verification of Kirchhoff's current Law applied to D.C. circuit.
5. Verification of Kirchhoff's Voltage Law applied to D.C. circuit.
6. To observe the A.C. and D.C. wave shape on C.R.O.

Evaluation of Practical Examination:

Internal Evaluation (50 marks):

Each sheet prepared would be evaluated by the faculty concerned on the date of preparing the sheet on a 5 point which would include the sheet drawn by the students and a Viva Voce taken by the faculty concerned. The marks shall be entered on the index sheet.

Evaluation Scheme:

EXPERIMENT (30 MARKS)	ATTENDANCE (10 MARKS)	VIVA (10MARKS)	TOTAL INTERNAL (50 MARKS)

External Evaluation (50 marks):

The external evaluation would also be done by the external examiner based on the experiment conducted during the examination:

EXPERIMENT (30 MARKS)	FILE WORK (10 MARKS)	VIVA (10MARKS)	TOTAL EXTERNAL (50 MARKS)

APPLIED MECHANICS LAB

Second/First Semester

Course Code: DIP256/DIP156	**L**	**T**	**P**	**C**
	-	**-**	**3**	**2**

LIST OF EXPERIMENTS:

1. To verify the law of Polygon of forces.
2. To verify the law of parallelogram
3. To verify the triangle of forces.
4. To verify the law of principle of moments.
5. To find the coefficient of friction between wood and steel.
6. To find the reaction at supports of a simply supported beam carrying point loads only.
7. To find the forces in the jib & tie of a jib crane.

Evaluation of Practical Examination:

Internal Evaluation (50 marks):

Each sheet prepared would be evaluated by the faculty concerned on the date of preparing the sheet on a 5 point which would include the sheet drawn by the students and a Viva Voce taken by the faculty concerned. The marks shall be entered on the index sheet.

Evaluation Scheme:

EXPERIMENT (30 MARKS)	ATTENDANCE (10 MARKS)	VIVA (10MARKS)	TOTAL INTERNAL (50 MARKS)

External Evaluation (50 marks):

The external evaluation would also be done by the external examiner based on the experiment conducted during the examination:

EXPERIMENT (30 MARKS)	FILE WORK (10 MARKS)	VIVA (10MARKS)	TOTAL EXTERNAL (50 MARKS)

INFORMATION TECHNOLOGY LAB

Second/First Semester

Course Code: DIP255/DIP155	**L**	**T**	**P**	**C**
	-	**-**	**3**	**2**

LIST OF EXPERIMENTS:

1. Create a document, using functions: Save as, Page number, Insert Bullets and Numbering.
2. Create a document, using different font's size, font's type and font's color.
3. Create a document, using the function page preview, page color, page border, page no. then print that document
4. Create a document, using function styles and formatting options with Page Set up.
5. Create a document and insert the Table, Image and Word art gallery.
6. Create a table and chart in excel and implement all formula as addition, subtraction, multiplication and division.
7. Create a Power point presentation, Save & print the power point using slide designing.
8. Create a Power point presentation using clipart, Word art gallery & Add transition & Animation effects.
9. Create a Web Page using basic HTML Tags.
10. Create a Tree Structure using basic DOS Commands.

Evaluation of Practical Examination:

Internal Evaluation (50 marks):

Each sheet prepared would be evaluated by the faculty concerned on the date of preparing the sheet on a 5 point which would include the sheet drawn by the students and a Viva Voce taken by the faculty concerned. The marks shall be entered on the index sheet.

Evaluation Scheme:

EXPERIMENT (30 MARKS)	ATTENDANCE (10 MARKS)	VIVA (10MARKS)	TOTAL INTERNAL (50 MARKS)

External Evaluation (50 marks):

The external evaluation would also be done by the external examiner based on the experiment conducted during the examination:

EXPERIMENT (30 MARKS)	FILE WORK (10 MARKS)	VIVA (10MARKS)	TOTAL EXTERNAL (50 MARKS)

ENGINEERING DRAWING

Second/First Semester

Course Code: DIP258/DIP188	**L**	**T**	**P**	**C**
	-	**-**	**6**	**3**

LIST OF EXPERIMENTS:

1. Drawing, instruments and their uses.

(a) Introduction to various drawing, instruments.
(b) Correct use and care of Instruments.
(c) Sizes of drawing sheets and their layouts.

2. (a) Lettering Technique: Printing of vertical and inclined normal single stroke capital letters and numbers.

(b) Conventional Representation: Types of lines, Conventional representation of materials. **(1 Sheet)**

3. Introduction to Scales: Necessity and use, R F; Types of scales used in general in engineering drawing, plane, diagonal and chord scales. **(1 Sheet)**

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
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. **(2 Sheet)**

6. Section of Solids: 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. **(1 Sheet)**

7. Development of Surfaces: Parallel line and redial line methods of development; Development of simple and truncated surfaces (Cube, prism, cylinder, cone and pyramid). **(1 Sheet)**

8. Isometric Projection: Isometric scale; Isometric Projection of solids. **(1 Sheet)**

9. Orthographic Projection: Nut and Bolt, Rivets and Riveted Joints. **(1 Sheet)**

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, Meerut.
3. Goyal B.K., *Engineering Drawing*, Asian Publishers, Muzaffarnagar.

Reference Books:

1. Gill P.S., *Machine Drawing*, S.K. Kataria & Sons, Delhi

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

Evaluation of Practical Examination:

Internal Evaluation (50 marks):

Each sheet prepared would be evaluated by the faculty concerned on the date of preparing the sheet on a 5 point which would include the sheet drawn by the students and a Viva Voce taken by the faculty concerned. The marks shall be entered on the index sheet.

Evaluation Scheme:

EXPERIMENT (30 MARKS)	ATTENDANCE (10 MARKS)	VIVA (10MARKS)	TOTAL INTERNAL (50 MARKS)

External Evaluation (50 marks):

The external evaluation would also be done by the external examiner based on the experiment conducted during the examination:

EXPERIMENT (30 MARKS)	FILE WORK (10 MARKS)	VIVA (10MARKS)	TOTAL EXTERNAL (50 MARKS)

WORKSHOP PRACTICE

Second/First Semester

Course Code: DIP257/DIP187

L	T	P	C
-	-	6	3

LIST OF EXPERIMENTS:

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 article such as wooden-picture frame, hanger, peg, name plates etc.
2. **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.
3. **Welding Shop:**
   - **Ex-1** Study of Gas and Electric arc welding methods.
   - **Ex-2** Welding of a 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.
4. **Machine Shop:**
   - **Ex-1** Study of Lathe machine.
   - **Ex-2** Plane and step turning & knurling practice on a lathe machine.
   - **Ex-3** Study & sketch of planning machine and plane a rectangle of cast iron.

Evaluation of Practical Examination:

Internal Evaluation (50 marks):

Each sheet prepared would be evaluated by the faculty concerned on the date of preparing the sheet on a 5 point which would include the sheet drawn by the students and a Viva Voce taken by the faculty concerned. The marks shall be entered on the index sheet.

Evaluation Scheme:

EXPERIMENT (30 MARKS)	ATTENDANCE (10 MARKS)	VIVA (10MARKS)	TOTAL INTERNAL (50 MARKS)

External Evaluation (50 marks):

The external evaluation would also be done by the external examiner based on the experiment conducted during the examination:

EXPERIMENT (30 MARKS)	FILE WORK (10 MARKS)	VIVA (10MARKS)	TOTAL EXTERNAL (50 MARKS)

SURVEYING – I
Third Semester

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

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 and detailed of classification 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. Explain different types of Tapes. 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.

(a) Errors in chain surveying.
(b) Correction for erroneous length of chain, simple problems. **(Lectures 06)**

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.
(e) Open traverse andclose traverse **(Lectures 06)**

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 angles, Concept of closing error, Adjustment of traverse graphically, Errors in compass surveying, Use of surveyor's compass and its construction details, comparison with prismatic compass. **(Lectures 06)**

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. Temporary adjustment: setting up and leveling, adjusting for parallax of Dumpy and I.O.P. level.

(Lectures 06)

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 and profile leveling (L-section and X-section) Errors in leveling, and precautions to

minimize them, Reciprocal leveling, Concept of curvature and refraction, Numerical problems, Concept and use of Automatic level. **(Lectures 06)**

The question paper shall have weightage to numerical/ case study 50% and to theoretical 50%.

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 shouldbe 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.

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

BUILDING MATERIAL
Third Semester

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

Unit I

Building Stone: Classification of Rocks: Geological and physical classification.

Quarrying: Basic Principles involved, Methods 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.

Availability, Characteristics and uses of the following stone:

Granite, Sand stone, Lime stone, Slate and marble, Availability of different stones in the state. **(Lectures 06)**

Unit II

Bricks & clay Products: Raw material for manufacture, Properties of good brick making earth. 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, classification of brick as per I.S. **(Lectures 06)**

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. **(Lectures 06)**

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: Cement paints their properties and uses, Varnish & polish, Lacquers' and enamels their properties uses and trade names. **(Lectures 06)**

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 their use.

Plastic: Properties and uses of plastic, use of plastic in civil engineering, Plastic Pipes, Taps, Valves, Polythene sheets, Water Proofing Materials. **(Lectures 06)**

The question paper shall have weightage to numerical/ case study 20% and to theoretical 80%.

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. Thetopic 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.

Reference Books:

1. Rangwala S.C., *Engineering Materials*, Charotar Publishing House Pvt. Ltd., Adand.

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

BUILDING CONSTRUCTION
Third Semester

Course Code: DCE304	**L**	**T**	**P**	**C**
Course Contents:	**3**	**1**	**-**	**4**

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. 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. 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. 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.

(Lectures 08)

Unit II

Stone Masonry

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

(b) Types of Stone Masonry: Rubble Masonry; random and coursed, Ashlar Masonry Ashlar fine, Ashlar rough tooled Ashlar 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. 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 & underpinning: 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. **(Lectures 08)**

Unit III

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).

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. **(Lectures 08)**

Unit IV

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.

Roofs: Glossary of terms for pitched roofs – batten, eaves board, facial board, gable hip, lap, purlin, rafter, rag bolt, valley, and ridge. Pitched roof, steel trusses, fink truss, arched trusses, North light truss, Roof coverings for pitched roofs. **(Lectures 08)**

Unit V

Stairs and Staircase: Glossary of terms: Stair case winders landing, strings, newel, baluster, riser, tread, width of staircase, hand rail, nosing. 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.

Surface Finishes: Plastering – Classification according to use and finishes like grit finish, rough cast, pebble dashed, plain plaster etc. 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. **(Lectures 08)**

The question paper shall have weightage to numerical/ case study 20% and to theoretical 80%.

Project work

There will be a project work assigned to students by the subject faculty. It will be of 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty and 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*. Laxmi Publication Pvt. Ltd., Delhi.

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

STRENGTH OF MATERIALS
Third Semester

Course Code: DME301	L	T	P	C
Course Contents:	3	1	-	4

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, Point of maximum B.M. and contra flexure.

(Lectures 08)

Unit II

Bending 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. **(Lectures 08)**

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. **(Lectures 08)**

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.

(1) Cantilever having point load at the free end, Cantilever with uniformly distributed load over the entire span.

(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.

(Lectures 08)

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.

(Lectures 08)

The question paper shall have weightage to numerical/ case study 50% and to theoretical 50%.

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. Thetopic 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.

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

HYDRAULICS
Third Semester

Course Code: DME302	L	T	P	C
Course Contents:	4	-	-	4

Unit I

Properties of Fluids: **Fluids:** Real fluid, ideal fluid, Fluid Mechanics, Hydraulics, 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. **(Lectures 08)**

Unit II

Measurement of Pressure: Use of simple manometer, differential manometer, Measurement of pressure by manometers. 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). **(Lectures 08)**

Unit III

Orifice: Definition of Orifice, and types of Orifices, Hydraulic Coefficients, Large vertical orifices. Free, drowned and partially drowned orifice.

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 and exit (No derivation of formula). Hydraulic gradient line and total energy line. **(Lectures 08)**

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. **(Lectures 08)**

Unit V

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

(Lectures 08)

The question paper shall have weightage to numerical/ case study 50% and to theoretical 50%.

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 shouldbe 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.

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

ENGLISH COMMUNICATION & SOFT SKILLS-III

(For All Undergraduate & Diploma Courses)

Third Semester

Course Code-DIP399	**L**	**T**	**P**	**C**
Course Content	**3**	**0**	**2**	**4**

Objective: To learn job oriented, Presentation and Interview skills and business correspondence.

Module -1:Functional Grammar-II (8 Lectures)

a) Sentence construction: Simple, Complex and Compound.
b) Application writing.
c) Paragraph writing, essay writing and précis writing.
d) Pre-testing of oral and writing skills.
[Note: As part of classroom activity, Review and recap of last semester and update progress of each student refer Module 3 of Workbook]

Module-2: Professional Skills (14 Lectures)

a) Bio-data, CV and resume writing.
b) Joining Letter, Cover Letter & Resignation letter.
c) Inter-Office Memo, Formal Business Letter, Informal Notes.
d) Minutes of the Meeting, Reporting Events, Summary Writing.
[Note: As part of classroom activity, use of standard templates and scenario buildings, practice sessions in classroom and homework assignments, refer to Workbook]

Module -3:Presentation Skills (10 Lectures)

a) Power-point presentations & presentation techniques.
b) Body language.
c) Describing people, places and events.
d) Extempore speech and just-a minute session.
[Note: As part of classroom activity, practice sessions carried out in class on different topics of the domain expertise, refer to Workbook]

Module -4:Interview Skills (8 Lectures)

a) Developing skill to (a) Debate (b) Discussion, Basics of GD & styles of GD.
b) Discussion in groups and group discussion on current issues.
c) Steps to prepare for an interview and mock interviews.
[Note: As part of classroom activity, language games, extensive coverage of contemporary issues for GDs, facing mock interview sessions with faculty, respective TPOs and Director CRC]

Third Semester Outcome:

1. Considerable improvement in student's progression in terms of LSRW to be noted.
2. Students will improve their writing skills for official communication.
3. Students will be able to give presentation and extempore speech on select topics.
4. Students will be able to discuss among peers and participate in group discussions on current issues.

Evaluation & Assessment: Students will be evaluated on all the four parameters of LSRW

External Exam	*Internal Assessment*	*Total*
50	50	100

Internal Assessment: 50

Best 2 out of Three CTs	*Attendance*	*Workbook Assignments & Viva*	*Total*
20	10	10+10	50

Viva to be carried out by external English faculty from within the university

External Assessment: 50

PRACTICAL EXAM*	VIVA	TOTAL
25 Marks	25 Marks	50 Marks

(The external evaluation would be done by an external examiner based on the PracticalExam and viva conducted during the examination. External examiner will be the English faculty from within the university)

*** Practical Exam Paper Structure: (One Hour Duration)**
Question paper should consist of four questions out of which the first question will be objective type of 10 marks. Other three question will be long, each of 05 marks.

Reference Books:

1. ILFS Bi-lingual Course in Basic English, ILFS Skill Development Corporation.
2. Communication Skills for Engineers and Scientists by Sangeeta Sharma & Binod Mishra, PHI Learning Private Limited, New Delhi.
3. Professional Communication by Malti Agarwal, Krishna Prakashan Media (P) Ltd., Meerut.
4. Communication Skills by Sanjay Kumar &PushpLata, Oxford University Press.
5. The Business letters by Madan Sood, Goodwill Publishing House, New Delhi.

SURVEYING LAB – I
Third Semester

Course Code: DCE351

L	T	P	C
-	-	6	3

Chain surveying:

1. (a) Ranging a line.
(b) Chaining a line and recording in the field book.
2. Taking offsets and setting out right angels with cross staff and Indian optical square.
3. Chain survey of asmall area. **Plate -I**

Compass survey:

4. (a) Setting the compass and taking observations.
(b)Measuring angle between the lines meeting at a point by prismatic compass.
5. Traversing with the prismatic compass and chaining of a closed traverse.
(Recording and plotting by included angles). **Plate II**
6. Determination of local attraction at a station by taking fore and back bearing.

Leveling:

7. To find difference of level between two distant points by taking staff reading on different stations from the single setting of Dumpy level/Automatic level.
8. To find difference of level between two points by taking at least four change points **Plate III**
9. Longitudinal sectioning of a road.
10. Cross- sectioning of a road. **Plate IV**

Evaluation of Practical Examination:

Internal Evaluation (50 marks):

Each sheet prepared would be evaluated by the faculty concerned on the date of preparing the sheet on a 5 point which would include the sheet drawn by the students and a Viva Voce taken by the faculty concerned. The marks shall be entered on the index sheet.

Evaluation Scheme:

EXPERIMENT (30 MARKS)	ATTENDANCE (10 MARKS)	VIVA (10MARKS)	TOTAL INTERNAL (50 MARKS)

External Evaluation (50 marks):

The external evaluation would also be done by the external examiner based on the experiment conducted during the examination:

EXPERIMENT (30 MARKS)	FILE WORK (10 MARKS)	VIVA (10MARKS)	TOTAL EXTERNAL (50 MARKS)

BUILDING CONSTRUCTION LAB
Third Semester

Course Code: DCE352	**L**	**T**	**P**	**C**
	-	**-**	**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. To Layout of a building.
8. To construct brick bonds (English and Flemish bonds) in one, one and half and two brick thick (a) walls. L. (b) Column.
9. Visit to construction site for showing the following item of works and to write specific report about the works seen.
   - **(a)** Construction of Masonry Walls.
   - **(b)** Flooring: Laying of flooring on an already prepared lime concrete base.
   - **(c)** Plastering of wall.
   - **(d)** White & colour washing.

Evaluation of Practical Examination:

Internal Evaluation (50 marks):

Each sheet prepared would be evaluated by the faculty concerned on the date of preparing the sheet on a 5 point which would include the sheet drawn by the students and a Viva Voce taken by the faculty concerned. The marks shall be entered on the index sheet.

Evaluation Scheme:

EXPERIMENT (30 MARKS)	ATTENDANCE (10 MARKS)	VIVA (10MARKS)	TOTAL INTERNAL (50 MARKS)

External Evaluation (50 marks):

The external evaluation would also be done by the external examiner based on the experiment conducted during the examination:

EXPERIMENT (30 MARKS)	FILE WORK (10 MARKS)	VIVA (10MARKS)	TOTAL EXTERNAL (50 MARKS)

STRENGTH OF MATERIALS LAB
Third Semester

Course Code: DME351

L	T	P	C
-	-	4	2

LIST OF PRACTICALS:

1. To 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. To find Young's Modulus of a steel wire using Searl's apparatus and to draw Load – Extension, Stress- Strain graph.
4. To Determine the maximum fiber stress in cross-section of a simply sup[ported beam with concentrated loads and to find the neutral axis of the section.
5. Determinations of yield stress, ultimate stress, percentage elongation, plot the stress strain diagram and compute. The value of Young's Modulus of mild steel.
6. Determination of the maximum deflection and Young's Modulus. of elasticity by deflection apparatus.
7. Determination of modulus of rigidity of material by Torsion apparatus.
8. Determination of hardness of a metal plate by Rock Well Brinell hardnesstesting machine.
9. To perform impact test on Izod Impact testing machine.
10. To Find stiffness of laminated and helical spring and draw Load-Extension Graph

Evaluation of Practical Examination:

Internal Evaluation (50 marks):

Each sheet prepared would be evaluated by the faculty concerned on the date of preparing the sheet on a 5 point which would include the sheet drawn by the students and a Viva Voce taken by the faculty concerned. The marks shall be entered on the index sheet.

Evaluation Scheme:

EXPERIMENT (30 MARKS)	ATTENDANCE (10 MARKS)	VIVA (10MARKS)	TOTAL INTERNAL (50 MARKS)

External Evaluation (50 marks):

The external evaluation would also be done by the external examiner based on the experiment conducted during the examination:

EXPERIMENT (30 MARKS)	FILE WORK (10 MARKS)	VIVA (10MARKS)	TOTAL EXTERNAL (50 MARKS)

HYDRAULICS LAB
Third Semester

Course Code: DME352

L	T	P	C
-	-	3	2

LIST OF PRACTICALS:

1. To verify Bernoullis Theorem.
2. To find out venturimeter coefficient.
3. To determine coef. of velocity (Cv), Coef. of discharge(Cd) Coef. of contraction (Cc) and verify the relation between them.
4. To perform Reynold's Experiment.
5. To determine Darcy's coefficient of friction for flow through pipes.
6. To verify loss of head due to:
   (a) Sudden enlargement
   (b) Sudden Contraction.
7. Study of the following –
   (a) Reciprocating Pumps or Centrifugal Pumps.
   (b) Impulse turbine or Reaction turbine
   (c) Pressure Gauge /pitot tube.

Evaluation of Practical Examination:

Internal Evaluation (50 marks):

Each sheet prepared would be evaluated by the faculty concerned on the date of preparing the sheet on a 5 point which would include the sheet drawn by the students and a Viva Voce taken by the faculty concerned. The marks shall be entered on the index sheet.

Evaluation Scheme:

EXPERIMENT (30 MARKS)	ATTENDANCE (10 MARKS)	VIVA (10MARKS)	TOTAL INTERNAL (50 MARKS)

External Evaluation (50 marks):

The external evaluation would also be done by the external examiner based on the experiment conducted during the examination:

EXPERIMENT (30 MARKS)	FILE WORK (10 MARKS)	VIVA (10MARKS)	TOTAL EXTERNAL (50 MARKS)

CONCEPTS OF INFORMATION SYSTEM LAB

Third Semester

Course Code: DIP359*	**L**	**T**	**P**	**C**
	-	**-**	**3**	**-**

LIST OF EXPERIMENTS:

1. Introduction to operating system:
   - How to operate.
   - How to create account.
   - How to use system settings.
   - Install and remove hardware and software.
   - Create a tree structure using basic DOS commands.
2. Introduction to MS Office Tools: MS Word, Excel, Power Point.
   Create a document using functions: page number, Bullets and numbering, font, styles and formatting options.
3. Create a document, using the function page set up, & page preview, page color, page border, Page no. then prints that document.
4. Create a word document and insert the table, image & word art gallery.
5. Create a table, chart in excel and implement all formula as addition, subtraction, multiplication and division.
6. Create a Power point presentation using slide designing, save & print the power point Presentation.
7. Introduction to internet-
   - www
   - web browser
   - web site
   - HTML
   - Search Engine etc.

***Only For Lateral Entry Students.**

SOIL MECHANICS AND FOUNDATION ENGINEERING

Fourth Semester

Course Code: DCE401	**L**	**T**	**P**	**C**
Course Contents:	**3**	**1**	**-**	**4**

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 and dry density, specific gravity, mass specific gravity, void ratio, porosity and degree of saturation. Relationships between various terms stated above. Consistency limits Liquid limit, Plastic limit, Shrinkage limit, Plasticity index, Consistency index, Grain size analysis by Sieve. **(Lectures 08)**

Unit II

Classification of soils: Particle size classification – I.S. 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.

(Lectures 08)

Unit III

Compaction: Definition of Compaction, Standard & modified Procter compaction test, Different methods of compaction, Brief description of field compaction methods, Compacting equipments, Indian Standards.

Consolidation: Definition of consolidation, Difference between consolidation and compaction. **(Lectures 08)**

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. **(Lectures 08)**

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. **(Lectures 08)**

The question paper shall have weightage to numerical/ case study 30% and to theoretical 70%.

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 shouldbe 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.

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

PUBLIC HEALTH ENGINEERING – I

Fourth Semester

Course Code: DCE402	**L**	**T**	**P**	**C**
Course Contents:	**2**	**2**	**-**	**3**

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, impounding reservoir and lakes, their quality of water and suitability. **(Lectures 06)**

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)** Flocculator **(iv)** Clarifier **(v)** Slow and rapid sand filter **(vii)** Chlorination chamber **(viii)** Water softening **(ix)** Removal of Iron and Manganese, Chemicals required for water treatment, their uses, and feeding devices, Simple design of sedimentation tank, and filters**.** **(Lectures 06)**

Unit III

Water Distribution

(i) Pipes: Different types of Pipes:- Cast iron, steel, plastic, (PVC,LDPE,HDPE), asbestos cement, concrete, plastic and GI 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. **(Lectures 06)**

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. **(Lectures 06)**

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. **(Lectures 06)**

The question paper shall have weightage to numerical/ case study 20% and to theoretical 80%.

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 shouldbe

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.
5. Sone Lal, Public Health Engineering, Nav Bharat Prakashan Meerut.

Reference Books:

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

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

CONCRETE TECHNOLOGY
Fourth Semester

Course Code: DCE403 **L T P C**
Course Contents: **3 - - 3**

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, 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. **(Lectures 06)**

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 content, shape, size and percentage of fineness passing 300 micron, Measurement of workability slump test, compaction factor test, Recommended slumps for placement in various conditions, Vee-Bee Consistometer.

(Lectures 06)

Unit III

Proportioning for Ordinary Concrete: Object of mix design, Strength required for various grades as per IS 456, Preliminary test, 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, bulking, 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. **(Lectures 06)**

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.
(iv) Compaction: (a) Hand compaction. **(b)** Machine compaction-types of vibrators (internal screed vibrators and form vibrators) immersion vibrations, Suitability of concrete mixes.
(v) Finishing: concrete slabs-screeding, floating, and trowelling.

(vi) 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. **(Lectures 06)**

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. **(Lectures 06)**

The question paper shall have weightage to numerical/ case study 20% and to theoretical 80%.

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 shouldbe 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.

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

IRRIGATION ENGINEERING
Fourth Semester

Course Code: DCE404 **L T P C**
Course Contents: **3 1 - 4**

Unit I
Introduction: Definition of irrigation. Necessity of irrigation, 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.
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. "Rain gauge's types in detail Problems based on delta, duty & Base period. **(Lectures 08)**

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.
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, theory's critical velocity ratio. Use of Garret's and Lacey's charts various types of canal lining - Advantages & Disadvantages. Design of open wells and Tube wells problems based on design of irrigation canal by Kennedy's and Lacey's theory. **(Lectures 08)**

Unit III
Canal Head Works: Definition, object, general layout, functions of different parts, Difference between Weir and Barrage.
Regulatory Works: Functions and explanation of terms used, Cross and Head regulators, Falls, Energy dissipaters, Outlets-Different types, Escapes. Different sub-types of regulatory works. **(Lectures 08)**

Unit IV
Cross Drainage Works: Functions and necessity of the following types: Aquaduct, Siphon, Super passage, Level crossing, inlet and outlet., Constructional details of the above.
Dams types: Earthen, causes of failure, masonry & concrete dams, Cross-section of gravity dam, Spillways causes of failure of earthen dams, "Ogee, overflows, straight and chute spillway. **(Lectures 08)**

Unit V
Water Logging and Drainage: Definition, causes and effects, detection, prevention and remedies water logging Surface and sub-surface drains and their layout. Discuss some Major Irrigation Projects in India. **(Lectures 08)**

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

The question paper shall have weightage to numerical/ case study 30% and to theoretical 70%.

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 shouldbe 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.

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

CONSTRUCTION MANAGEMENT

Fourth Semester

Course Code: DCE406	**L**	**T**	**P**	**C**
Course Contents:	**3**	**-**	**-**	**3**

Unit I

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. **(Lectures 06)**

Unit II

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. **(Lectures 06)**

Unit III

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.

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 building. **(v)** Organizing labour at site. **(Lectures 06)**

Unit IV

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)** Labour welfare. **(iv)** Payment of wages Act. Minimum wages Act. **(v)** Workmen compensation Act. **(vi)** Contract Labour Act.

Control of Progress: (i) Methods of recording progress. **(ii)** Analysis of progress. **(iii)**Taking corrective actions keeping head of office informed. **(Lectures 06)**

Unit V

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.

(Lectures 06)

The question paper shall have weightage to numerical/ case study 20% and to theoretical 80%.

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 shouldbe 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.

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

ENGLISH COMMUNICATION & SOFT SKILLS-IV

(For All Undergraduate & Diploma Courses)

Fourth Semester

Course Code-DIP499	**L**	**T**	**P**	**C**
Course Content	**3**	**-**	**2**	**4**

Objective: To inculcate behavioural skills in students for the Corporate World

Module -1: Fundamentals of Time Management & Managing Change.(12 Lectures)

a) Time Management.
b) Managing People and managing change.
c) Team building, Leadership and taking decisions.
d) Stress Management.
[Note: As part of classroom activity, refer to the Workbook, guest lecture by management faculty]

Module -2:Public Speaking (8 Lectures)

a) Art of public speaking.
b) Welcome speech.
c) Farewell Speech.
d) Vote of thanks.
[Note: As part of classroom activity, extensive practice sessions in class and home assignments]

Module -3:Personality Development-III (8 Lectures)

a) Rude vs. Polite Behaviour.
b) Ethics and human values.
c) Concernfor environment.
d) Crisis Management.
[Note: As part of classroom activity, refer to the Workbook, guest lecture by management faculty and industry representative]

Module -4: Oral Practice (12 Lectures)

a) Debate.
b) Just-a-minute.
c) Group Discussions.
d) Mock Interviews.
[Note: As part of classroom activity, extensively test the oral skills and update the progress card of each student]

Fourth Semester Outcome:

1. Notable improvement in student's progression in terms of LSRW.
2. Students will be able to imbibe good practices of self-discipline and professionalism required in the corporate world.
3. Students will be able to develop the art of publicspeaking.
4. Students will be able to learn behavioral skills suitable for the corporate world.

Evaluation & Assessment: The students will be evaluated on all four parameters of LSRW

External Exam	*Internal Assessment*	*Total*
50	50	100

Internal Assessment: 50

Best 2 out of Three CTs	*Attendance*	*Workbook Assignments & Viva*	*Total*
20	10	10+10	50

Viva to be carried out by external English faculty from within the university

External Assessment: 50

PRACTICAL EXAM*	VIVA	TOTAL
25 Marks	25 Marks	50 Marks

(The external evaluation would be done by an external examiner based on the PracticalExam and viva conducted during the examination. External examiner will be the English faculty from within the university)

*** Practical Exam Paper Structure: (One Hour Duration)**
Question paper should consist of four questions out of which the first question will be objective type of 10 marks. Other three question will be long, each of 05 marks.

Reference Books:

1. ILFS Bi-lingual Course in Basic English, ILFS Skill Development Corporation.
2. Communication Skills for Engineers and Scientists by Sangeeta Sharma &Binod Mishra, PHI Learning Private Limited, New Delhi.
3. Professional Communication by Malti Agarwal, Krishna Prakashan Media (P) Ltd., Meerut.
4. Communication Skills by Sanjay Kumar &PushpLata, Oxford University Press.
5. The Business letters by Madan Sood, Goodwill Publishing House, New Delhi.

SOIL MECHANICS AND FOUNDATION ENGINEERING LAB

Fourth Semester

Course Code: DCE451	**L**	**T**	**P**	**C**
	-	**-**	**4**	**2**

LIST OF EXPERIMENTS:

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 sand by Shear Box text.
7. Unconfined compression test.
8. Standard Proctor compaction text.

Evaluation of Practical Examination:

Internal Evaluation (50 marks):

Each sheet prepared would be evaluated by the faculty concerned on the date of preparing the sheet on a 5 point which would include the sheet drawn by the students and a Viva Voce taken by the faculty concerned. The marks shall be entered on the index sheet.

Evaluation Scheme:

EXPERIMENT (30 MARKS)	ATTENDANCE (10 MARKS)	VIVA (10MARKS)	TOTAL INTERNAL (50 MARKS)

External Evaluation (50 marks):

The external evaluation would also be done by the external examiner based on the experiment conducted during the examination:

EXPERIMENT (30 MARKS)	FILE WORK (10 MARKS)	VIVA (10MARKS)	TOTAL EXTERNAL (50 MARKS)

PUBLIC HEALTH ENGINEERING LAB
Fourth Semester

Course Code: DCE452

L	T	P	C
-	-	2	1

LIST OF EXPERIMENTS:

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 perform chlorine demand test.
8. To determine hardness of water.
9. To determine available chlorine in bleaching powder.
10. To visit and write specific report for the following: (Any one)
    - **a.** Water treatment plant.
    - **b.** Sewage treatment plant for 5.
    - **c.** Construction site for layout of water supply & sewerage system.

Evaluation of Practical Examination:

Internal Evaluation (50 marks):

Each sheet prepared would be evaluated by the faculty concerned on the date of preparing the sheet on a 5 point which would include the sheet drawn by the students and a Viva Voce taken by the faculty concerned. The marks shall be entered on the index sheet.

Evaluation Scheme:

EXPERIMENT (30 MARKS)	ATTENDANCE (10 MARKS)	VIVA (10MARKS)	TOTAL INTERNAL (50 MARKS)

External Evaluation (50 marks):

The external evaluation would also be done by the external examiner based on the experiment conducted during the examination:

EXPERIMENT (30 MARKS)	FILE WORK (10 MARKS)	VIVA (10MARKS)	TOTAL EXTERNAL (50 MARKS)

CONCRETE TECHNOLOGY LAB

Fourth Semester

Course Code: DCE453	**L**	**T**	**P**	**C**
	-	**-**	**4**	**2**

LIST OF EXPERIMENTS:

1. To determine flakiness index and elongation index of coarse aggregate (ISI:2386-pt.1-1963).
2. Field method to determine fine silt in aggregate.
3. Determination of specific gravity and water absorption of aggregates (IS:2386 Part-III-1963) (for aggregates 40mm to 10mm).
4. Determination of bulk density and voids of aggregates (IS:2386-Part-III-1963).
5. To determine necessary adjustment for bulking of fine aggregate by field method (IS:2383-Part-III-1983).
6. 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.
7. Compacting factor test for workability (IS:1199-1959)
8. Workability of concrete by Vee-Bee consistometer.
9. Fineness modulus of sand.

Evaluation of Practical Examination:

Internal Evaluation (50 marks):

Each sheet prepared would be evaluated by the faculty concerned on the date of preparing the sheet on a 5 point which would include the sheet drawn by the students and a Viva Voce taken by the faculty concerned. The marks shall be entered on the index sheet.

Evaluation Scheme:

EXPERIMENT (30 MARKS)	ATTENDANCE (10 MARKS)	VIVA (10MARKS)	TOTAL INTERNAL (50 MARKS)

External Evaluation (50 marks):

The external evaluation would also be done by the external examiner based on the experiment conducted during the examination:

EXPERIMENT (30 MARKS)	FILE WORK (10 MARKS)	VIVA (10MARKS)	TOTAL EXTERNAL (50 MARKS)

CIVIL ENGINEERING DRAWING-I

Fourth Semester

Course Code: DCE454	**L**	**T**	**P**	**C**
	-	**-**	**8**	**4**

LIST OF EXPERIMENTS:

1. Foundations. **1 Plate**
2. Doors & windows. **1 Plate**
3. Roofs: Wooden roof truss details, Section of RCC & RB flat roofs. **1 Plate**
4. Floors. **1 Plate**
   - **(a)** Concrete floor finish over ground floor.
   - **(b)** Terrazzo floor finish over ground floor.
   - **(c)** Terrazzo tile floor finish over ground.
5. Working drawing of a two roomed building with kitchen, bath and W.C. **1 Plate**
7. Working drawing of a three roomed building from a given line plan and given data. **1 Plate**
8. Stair case **1 Plate**
   - **(a)** Details of dog legged stairs.
   - **(b)** Plans of remaining type of stairs.
9. Detailed plan and cross section of a domestic septic and soak pit for 10 users as per IS:2470 Part I. **1 Plate**
10. Detailed plan and cross section of bathroom, kitchen and W.C. connections. **1 Plate**
11. Two Room building working drawing with AutoCAD. **1 Plate**

Text Books:

1. Singh Gurcharan, *Civil Engineering Drawing*, Standard Publishers Distributors, Delhi.
2. Sati K.D., *Civil Engineering Drawing – I,* Asian Publishers Muzaffarnagar.

Reference Books:

1. V.B. Sikka, *Civil Engineering Drawing*, S.K. Kataria & Sons.

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

Evaluation of Practical Examination:

Internal Evaluation (50 marks):

Each sheet prepared would be evaluated by the faculty concerned on the date of preparing the sheet on a 5 point which would include the sheet drawn by the students and a Viva Voce taken by the faculty concerned. The marks shall be entered on the index sheet.

Evaluation Scheme:

EXPERIMENT (30 MARKS)	ATTENDANCE (10 MARKS)	VIVA (10MARKS)	TOTAL INTERNAL (50 MARKS)

External Evaluation (50 marks):

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

EXPERIMENT (30 MARKS)	FILE WORK (10 MARKS)	VIVA (10MARKS)	TOTAL EXTERNAL (50 MARKS)

TRANSPORTATION ENGINEERING – I

Fifth Semester

Course Code: DCE501	**L**	**T**	**P**	**C**
Course Contents:	**3**	**2**	**-**	**4**

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, kerb, formation levels, camber and gradient Super elevation. **(ii)** Drawing of typical cross-sections in cutting and filling on straight, **(iii)** 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. **(Lectures 08)**

Unit II

Marking of alignment

Traffic Engineering: (i) Traffic control devices - Signs, markings and signals, their effectiveness and location, installation of signs, IRC standards. **(ii)** Segregation of traffic. **(iii)** Types of intersections and how to choose them. **(iv)** 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)** Aggregates: Availability of road aggregates in India, requirements of road aggregates as per IS specifications. **(v)** 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. **(Lectures 08)**

Unit III

Road Pavements; Types and Their Construction: (i) Road pavement: Flexible andrigid 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.

(Lectures 08)

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. **(ii)** Maintenance of bituminous roads such as patch work and resurfacing, Maintenance of concrete roads-filling cracks, repairing joints, maintenance of shoulders (berms), maintenance of traffic control devices. **(Lectures 08)**

Unit V

Construction Equipment: Output and use of the following plant and equipments: **(i)** Hot Mix Plant. **(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. **(Lectures 08)**

The question paper shall have weightage to numerical/ case study 20% and to theoretical 80%.

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 shouldbe 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., Roorke.

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

SURVEYING – II
Fifth Semester

Course Code: DCE502	L	T	P	C
Course Contents:	3	2	-	4

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. **(Lectures 08)**

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. **(Lectures 08)**

Unit III

Theodolite Surveying: Working of a transit vernier 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 method; traversing by stadia measurement; Theodolite triangulation and plotting a traverse; concept of coordinate, Errors in theodolite survey and precautions taken to minimize them; Limits of precision in theodolite traversing. Principle and working of a Electronic theodolite, Brief introduction to tachometry.

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

(Lectures 08)

Unit IV

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 usinga theodolite. **(Lectures 08)**

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. **(Lectures 08)**

The question paper shall have weightage to numerical/ case study 50% and to theoretical 50%.

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. Thetopic 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.

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

PUBLIC HEALTH ENGINEERING – II

Fifth Semester

Course Code: DCE505	**L**	**T**	**P**	**C**
Course Contents:	**2**	**2**	**-**	**3**

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. **(Lectures 06)**

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.

(Lectures 06)

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.

(Lectures 06)

Unit IV

Rural Sanitation: (i) Drainage: Topography, alignment of lanes, storm water, natural passage, development of drains, alignment, size and gradient. Phase Programme. **(ii)** Disposal of night soil and village latrines: Collection and disposal of garbage and refuse.

(Lectures 06)

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 Treatment: (i) Meaning and principle of primary and secondary treatment, constructional details of screening chamber, grit chamber, clarifier, tricking filters, secondary clarifiers/aeration tank. **(ii)** Sludge treatment, sludge digestion, sludge drying, sludge disposal **(iii)** Oxidation ponds. **(Lectures 06)**

The question paper shall have weightage to numerical/ case study 20% and to theoretical 80%.

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 shouldbe 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.
5. Sone Lal, Public Health Engineering, Nav Bharat Prakashan Meerut.

Reference Books:

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

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

CONSTRUCTION ACCOUNTS
Fifth Semester

Course Code: DCE508 **L T P C**
Course Contents: **2 2 - 3**

Unit I
Accounts
Introduction: (i) Necessity of account.
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)** Imprest account and temporary advance. **(v)** Definition of imprest and rules for maintaining imprest account, Actual filling of the prescribed form, **(vi)** Definition of temporary advance; its difference from the imprest account; maintenance of temporary advance account. **(Lectures 06)**

Unit II
Stores: 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, Estimates for loss of stock and writing off.
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. **(Lectures 06)**

Unit III
Road Metal: (a) Meaning. **(b)** Rules for maintaining road metal returns filling up the prescribed form. **(c)** Method of checking. **(d)** Shortages and surpluses.
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, Issue of Materials to contractors.

(Lectures 06)

Unit IV
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. **(Lectures 06)**

Unit V

Payment for Works: (i) Daily labour: **(a)** Meaning. **(b)** Muster roll**,** Rules, Instruction for maintenance. 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 items **(b)** Check measurement Book (C.M.B.) **(c)** Standard measurement book (SMB) **(ii)** Different types of payment **(a)** First and final payment. **(b)** Running payment, Secured advance, on account payment, Advance payment, running and final payment. **(iii)** Hand receipt, **(iv)** Clause in which the detailed measurements are dispensed with. **Miscellaneous:** Duties of Junior Engineer/S.O. and S.D.O.

(Lectures 06)

The question paper shall have weightage to numerical/ case study 20% and to theoretical 80%.

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 shouldbe 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.

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

INDUSTRIAL ECOLOGY
Fifth Semester

Course Code: DIP502/DIP603	**L**	**T**	**P**	**C**
Course Content:	**4**	**-**	**-**	**4**

Unit I

Introduction to Industrial Psychology – definition, scope and importance. **(Lectures 08)**

Unit II

Motivation: Meaning, factors, motivation theories (Maslow, Herzberg and McGregor); understanding stress and its consequences, causes of stress, managing stress; group dynamics: features of group, group cohesiveness.

(Lectures 08)

Unit III

Work Environment: Design of work place; fatigue: causes and prevention, work place boredom, accidents and safety. Conflict: Concept, sources and types. **(Lectures 08)**

Unit IV

Constituents of Indian economy: Agriculture, Industry and Service; Innovation and Entrepreneurship: Industrial growth in India, role and challenges of small scale industries, sources of funding for small scale industries, industrial sickness.

(Lectures08)

Unit V

Privatization and globalization in India.
Problems of industry- technology, waste disposal, industrial law and dispute.

(Lectures08)

The question paper shall have weightage to case study 20% and to theoretical 80%.

Text Books:

1. Agarwal G.K. *"Social control and change"* Sahitya Bhawan Publication Agra.
2. Agarwal G.K. *"Social Disorganization"* Sahitya Bhawan Publication Agra.
3. Gillin & Gillin *"Cultural Sociology"* The Macmillian Company.
4. Denis. K *"Human Society"* Surjeet Publication Delhi.
5. Dewett, K.K., *"Modern Economic Theory"* S. Chand & Co.
6. Luthers Fred *"Organizational Behavior"*.

Reference Books:

1. Admas Bert N. *"A Sociological Interpretation"* Rand me Nally Chicago 1975.
2. Prasad L.M. *"Principles of Management".*
3. Stonier A.W. & D.C. Horgne, *"A Text Book of Economic Theory"*, Oxford Publishing House Pvt. Ltd.

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

ENVIRONMENT STUDIES

Fifth Semester

Course Code: DIP503/DIP604

L	T	P	C
4	-	-	4

Objective: To create awareness among students about environment protection.

Course Outcomes:

Based on this course, the Engineering graduate will understand / evaluate / develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development.

Course Content:

Unit I

Definition and Scope of environmental studies, multidisciplinary nature of environmental studies, Concept of sustainability & sustainable development. **(Lectures 08)**

Ecology and Environment: Concept to fan Ecosystem-its structure and functions, Energy Flow in an Ecosystem, Food Chain, Food Web, Ecological Pyramid& Ecological succession, Study of following ecosystems: Forest Ecosystem, Grass land Ecosystem & Aquatic Ecosystem & Desert Ecosystem.

Unit II

Natural Resources: Renewable & Non-Renewable resources; Land resources and land use change; Land degradation, Soil erosion & desertification. **Deforestation**: Causes & impacts due to mining, Dam building on forest biodiversity & tribal population. **Energy Resources**: Renewable & Non-Renewable resources, Energy scenario & use of alternate energy sources, Case studies.

Biodiversity: Hot Spots of Biodiversity in India and World, Conservation, Importance and Factors Responsible for Loss of Biodiversity, Bio geographical Classification of India. **(Lectures 08)**

Unit III

Environmental Pollutions: Types, Causes, Effects & control; Air, Water, soil & noise pollution, Nuclear hazards & human health risks, Solid waste Management; Control measures of urban & industrial wastes, pollution case studies. **(Lectures 08)**

Unit IV

Environmental policies & practices: Climate change & Global Warming (Green house Effect),Ozone Layer -Its Depletion and Control Measures, Photochemical Smog, Acid Rain Environmental laws: Environment protection Act; air prevention & control of pollution act, Water Prevention & Control of Pollution Act, Wild Life Protection Act, Forest Conservation Acts, International Acts; Montreal & Kyoto Protocols & Convention on biological diversity, Nature reserves, tribal population & Rights & human wild life conflicts in Indian context

(Lectures 08)

Unit V

Human Communities & Environment: Human population growth; impacts on environment, human health & welfare, Resettlement & rehabilitation of projects affected person: A case study, Disaster Management; Earthquake, Floods & Droughts, Cyclones & Landslides, Environmental Movements; Chipko, Silent Valley, Vishnoi's of Rajasthan, Environmental Ethics; Role of Indian & other regions & culture in environmental conservation, Environmental communication & public awareness; Case studies. **(Lectures 08)**

Field Work:

1. Visit to an area to document environmental assets; river/forest/flora-faunaetc.
2. Visit to a local polluted site: urban/ rural/industrial/agricultural.
3. Study of common plants, insects, birds & basic principles of identification.
4. Study of simple ecosystem; pond, river etc.

Text Books:

1. "Environmental Chemistry", De, A. K., New Age Publishers Pvt. Ltd.
2. "Introduction to Environmental Engineering and Science", Masters, G. M., Prentice Hall India Pvt. Ltd.
3. "Fundamentals of Ecology", Odem, E. P., W. B. Sannders Co.

Reference Books:

1. "Biodiversity and Conservation", Bryant, P. J., Hypertext Book
2. "Textbook of Environment Studies", Tewari, Khulbe & Tewari, I.K. Publication

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

TRANSPORTATION ENGINEERING LAB

Fifth Semester

Course Code: DCE551	**L**	**T**	**P**	**C**
	-	**-**	**4**	**2**

LIST OF EXPERIMENTS:

1. Determination of resistance toabrasion 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 one 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, P.W.D. Research Lab at Lucknow/C.B.R.I. Roorkee.
6. Hume Pipe Factory.

Evaluation of Practical Examination:

Internal Evaluation (50 marks):

Each sheet prepared would be evaluated by the faculty concerned on the date of preparing the sheet on a 5 point which would include the sheet drawn by the students and a Viva Voce taken by the faculty concerned. The marks shall be entered on the index sheet.

Evaluation Scheme:

EXPERIMENT (30 MARKS)	ATTENDANCE (10 MARKS)	VIVA (10MARKS)	TOTAL INTERNAL (50 MARKS)

External Evaluation (50 marks):

The external evaluation would also be done by the external examiner based on the experiment conducted during the examination:

EXPERIMENT (30 MARKS)	FILE WORK (10 MARKS)	VIVA (10MARKS)	TOTAL EXTERNAL (50 MARKS)

SURVEYING LAB – II
Fifth Semester

Course Code: DCE552	L	T	P	C
	-	-	6	3

(A) Plane Tabling:

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

2. (a) Orientation by – **(i)** Trough compass & (ii) Back sighting.
(b) Plotting a few points by Intersection method. **Plate 1.**

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

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

(B) Contouring:

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

6. Preparing a contour plan by method of squares. **Plate 1.**

(C) Theodolite:

7. Drill for taking out, the Theodolite Mounting on the tripod and placing it back in the Box.

8. Reading the vernier and working out the least count, Measurement of horizontal angles by repetition and reiteration method.

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

10. Measurement of vertical angles by the use of Theodilite.

11. Measurement of Magnetic Bearing of a line.

12. Measurement of horizontal & vertical angles with Electronic Theodilite/Total station. **Plate 1.**

(D) Curves:

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

14. Setting out a circular cure with transition length by linear measurements. **Plate 1.**

Survey camp of one week duration shall be arranged in the University campus or nearby locality to enhance the actual Practical knowledge of site surveying. The students are supposed to do topographical survey of the area showing contours and other features on site map.

Evaluation of Practical Examination:

Internal Evaluation (50 marks):

Each sheet prepared would be evaluated by the faculty concerned on the date of preparing the sheet on a 5 point which would include the sheet drawn by the students and a Viva Voce taken by the faculty concerned. The marks shall be entered on the index sheet.

Evaluation Scheme:

EXPERIMENT (30 MARKS)	ATTENDANCE (10 MARKS)	VIVA (10MARKS)	TOTAL INTERNAL (50 MARKS)

External Evaluation (50 marks):

The external evaluation would also be done by the external examiner based on the experiment conducted during the examination:

EXPERIMENT (30 MARKS)	FILE WORK (10 MARKS)	VIVA (10MARKS)	TOTAL EXTERNAL (50 MARKS)

CIVIL ENGINEERING DRAWING – II

Fifth Semester

Course Code: DCE553

L	T	P	C
-	-	6	3

PART A: Steel Structural Drawing

1. Tubular Steel Roof Trusses: Types of trusses for different spans, Details of column – truss connection, Simple trusses using tubular sections, North light provision. **1 Plate.**

2. Steel Column base connections (slab base & gusseted base). **1 Plate.**

PART B: R.C.C. Structures

1. Public building:

Plan elevation & sections of a primary School building, primary health center, guest house, double story showing details of following.

(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 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. **2 Plate.**

2. Slab and Retaining Wall:

i. Details of reinforcement in plan and section for a simply supported One way RCC slab.

ii. Details of reinforcement for a cantilever retaining wall with the given design data regarding the reinforcement, size and shape of the wall. **1 Plate.**

PART C: Irrigation Engineering:

1. Typical cross-sections of a channel in cutting, partly cutting and fully in filling.

2. Typical L-section ofa distributry. **3 Plate.**

PART D: Reading and Interpreting Civil Engineering Drawing.

Text Books:

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

2. Sati K.D., *Civil Engineering Drawing – I,* Asian Publishers Muzaffarnagar.

Reference Books:

1. V.B. Sikka, *Civil Engineering Drawing*, S.K. Katariya & Sons.

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

Evaluation of Practical Examination:

Internal Evaluation (50 marks):

Each sheet prepared would be evaluated by the faculty concerned on the date of preparing the sheet on a 5 point which would include the sheet drawn by the students and a Viva Voce taken by the faculty concerned. The marks shall be entered on the index sheet.

Evaluation Scheme:

EXPERIMENT (30 MARKS)	ATTENDANCE (10 MARKS)	VIVA (10MARKS)	TOTAL INTERNAL (50 MARKS)

External Evaluation (50 marks):

The external evaluation would also be done by the external examiner based on the experiment conducted during the examination:

EXPERIMENT (30 MARKS)	FILE WORK (10 MARKS)	VIVA (10MARKS)	TOTAL EXTERNAL (50 MARKS)

INDUSTRIAL TRAINING
Fifth Semester

Course Code: DCE555

L	T	P	C
-	-	-	4

Four 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. They should submit report and his assessment in computerized form on the given formats (Annexure Ist & IInd) and it should be signed by faculty and Trainee Incharge.

1. **Topographical Map:** survey work with the help of level & plane table and preparethe 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 Dam:** 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 Principal – 25 marks

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

DESIGN OF REINFORCED CEMENT CONCRETE (RCC) STRUCTURE

Sixth Semester

Course Code: DCE608	**L**	**T**	**P**	**C**
Course Contents:	**3**	**2**	**-**	**4**

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.

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, and actual neutral axis, concept of balanced, under reinforced and over-reinforced sections. **(iii)** Shear Strength: Permissible shear stresses as per IS:456 – 2000, 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 – 2000. Design of singly reinforced concrete beams as per IS:456 – 2000 from the given data such as span, load and properties of materials used, Design of lintel. **(Lectures 08)**

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 – 2000.(Corners not held down)-IS-code method., **(v)** Detailing of reinforcement. **(Lectures 08)**

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.

(Lectures 08)

Unit IV

Design of Columns & Column Footings: (i) Concept of long and short columns. **(ii)** Specifications for main and lateral reinforcement, **(iii)** Behavior of RCC column underaxial 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).

(Lectures 08)

Unit V

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.

Design of the following: (i) Singly reinforced rectangular beam. **(ii)** One way slab simply supported. **(Lectures 08)**

The question paper shall have weightage to numerical/ case study 50% and to theoretical 50%.

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

Text Books:

1. S.K. Mallick, *Reinforced Concrete*, Oxford & IBH Publshing Co., Delhi.
2. 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.*

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

DESIGN OF STEEL STRUCTURES
Sixth Semester

Course Code: DCE602	**L**	**T**	**P**	**C**
Course Contents:	**3**	**2**	**-**	**4**

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 – 2007. **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)** Introduction to bolts and bolted connections **(iii)** 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. **(Lectures 08)**

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. **(Lectures 08)**

Unit III

Compression Members: Design of struts and columns as per IS:800 – 2007. Effective length, slenderness ratio and permissible stresses, simple and built up sections, concept of lacings in built up columns. **(Lectures 08)**

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. **(Lectures 08)**

Unit V

Column Bases: Column bases, design of simple column base for axially loaded columns. **(Lectures08)**

The question paper shall have weightage to numerical/ case study 50% and to theoretical 50%.

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 oneach 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, *Designof steel Structures*, Standard Book House, Delhi.
2. Negi L.S., *Design of steel Structures*, Tata Mc. Graw Hill Education Pvt. Ltd., Delhi.
3. Lal S., Sharma Salil, Design of Steel & Masonry Structures, Nav Bharat Prakashan Meerut.
4. Gharpuray, C.T., Design of Steel & Masonry Structures, Asian Publishers Muzaffar Nagar.

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*.

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

TRANSPORTATION ENGINEERING – II

Sixth Semester

Course Code: DCE603	**L**	**T**	**P**	**C**
Course Contents:	**2**	**2**	**-**	**3**

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.

(Lectures 06)

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 gauge 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. Signals and it's types

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. **(Lectures 06)**

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. **(Lectures 06)**

Unit IV

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.

(Lectures 06)

Unit V

Air Port: Basic Element, Runway and Taxi Way. Tunnel: Introduction, Classification and Construction Method. **(Lectures 06)**

The question paper shall have weightage to numerical/ case study 20% and to theoretical 80%.

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 shouldbe 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.
4. Gupta D.V., *Transportation Engineering*, Asian Publishers Muzaffarnagar.

Reference Books:

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

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

EARTHQUAKE ENGINEERING
Sixth Semester

Course Code: DCE604 **L T P C**
Course Contents: **2 2 - 3**

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. **(Lectures 06)**

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. **(Lectures 06)**

Unit III
Effect of soils and liquefaction, Remedial measures, Construction of earthstructures, Seismic construction of masonry buildings, precisions of IS:4326. **(Lectures 06)**

Unit IV
Seismic construction of RC buildings detailing, provisions of IS: 13920. Retrofitting of masonry and reinforced concrete buildings. **(Lectures 06)**

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 disseminationand communication. **(Lectures 06)**

The question paper shall have weightage to case study 20% and to theoretical 80%.

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. Thetopic 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. Sone Lal, Earth Quake Engineering, Nav Bharat Prakashan Meerut.
4. 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.

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

ESTIMATING, COSTING AND VALUATION

Sixth Semester

Course Code: DCE605	**L**	**T**	**P**	**C**
Course Contents:	**3**	**2**	**-**	**4**

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. 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. **(Lectures 08)**

Unit II

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)** Cementconcrete in foundation. **(c)** R.C.C. in roof slabs. **(d)** First class brick masonry in cement mortar. **(e)** Cement plaster. **(f)** Cement pointing: Flush, deep pointing. **(Lectures 08)**

Unit III

Public health: Preparation of detailed estimate for laying a water supply line (C.I. Pipe). Preparation of detailed estimates for sanitary and water supply fittings in a domestic building containing one set of toilets and septic tank. **(Lectures 08)**

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. **(Lectures 08)**

Unit V

Valuation: Purpose of valuation, principles of valuation. Definition of terms such as depreciation, sinking fund, salvages and scraps 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. **(Lectures 08)**

The question paper shall have weightage to numerical/ case study 50% and to theoretical 50%.

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 oneach 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. Dutta B.N., *Estimating & Costing in Civil Engineering*, UBS Publishers Pvt. Ltd., New Delhi.
2. Gupta D.V., *Estimating, Costing and Valuation,* Asian Publishers Muzaffarnagar.

Reference Books:

1. Birdi G.S., *Estimating, Costing & Valuation*.
2. Rangwalala S.C., *Estimating, Costing & Valuation*, Charotar Publishing House Pvt. Ltd., Anand.

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

ENVIRONMENT STUDIES

Sixth Semester

Course Code: DIP604/DIP503

L	T	P	C
4	-	-	4

Objective: To create awareness among students about environment protection.

Course Outcomes:

Based on this course, the Engineering graduate will understand / evaluate / develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development.

Course Content:

Unit I

Definition and Scope of environmental studies, multidisciplinary nature of environmental studies, Concept of sustainability & sustainable development. **(Lectures 08)**

Ecology and Environment: Concept to fan Ecosystem-its structure and functions, Energy Flow in an Ecosystem, Food Chain, Food Web, Ecological Pyramid& Ecological succession, Study of following ecosystems: Forest Ecosystem, Grass land Ecosystem & Aquatic Ecosystem & Desert Ecosystem.

Unit II

Natural Resources: Renewable & Non-Renewable resources; Land resources and land use change; Land degradation, Soil erosion & desertification. **Deforestation**: Causes & impacts due to mining, Dam building on forest biodiversity & tribal population. **Energy Resources**: Renewable & Non-Renewable resources, Energy scenario & use of alternate energy sources, Case studies.

Biodiversity: Hot Spots of Biodiversity in India and World, Conservation, Importance and Factors Responsible for Loss of Biodiversity, Bio geographical Classification of India. **(Lectures 08)**

Unit III

Environmental Pollutions: Types, Causes, Effects & control; Air, Water, soil & noise pollution, Nuclear hazards & human health risks, Solid waste Management; Control measures of urban & industrial wastes, pollution case studies. **(Lectures 08)**

Unit IV

Environmental policies & practices: Climate change & Global Warming (Green house Effect),Ozone Layer -Its Depletion and Control Measures, Photochemical Smog, Acid Rain Environmental laws: Environment protection Act; air prevention & control of pollution act, Water Prevention & Control of Pollution Act, Wild Life Protection Act, Forest Conservation Acts, International Acts; Montreal & Kyoto Protocols & Convention on biological diversity, Nature reserves, tribal population & Rights & human wild life conflicts in Indian context.

(Lectures 08)

Unit V

Human Communities & Environment: Human population growth; impacts on environment, human health & welfare, Resettlement & rehabilitation of projects affected person: A case study, Disaster Management; Earthquake, Floods & Droughts, Cyclones & Landslides, Environmental Movements; Chipko, Silent Valley, Vishnoi's of Rajasthan, Environmental Ethics; Role of Indian & other regions & culture in environmental conservation, Environmental communication & public awareness; Case studies. **(Lectures 08)**

Field Work:

1. Visit to an area to document environmental assets; river/forest/flora-faunaetc.
2. Visit to a local polluted site: urban/ rural/industrial/agricultural.
3. Study of common plants, insects, birds & basic principles of identification.
4. Study of simple ecosystem; pond, river etc.

Text Books:

1. "Environmental Chemistry", De, A. K., New Age Publishers Pvt. Ltd.
2. "Introduction to Environmental Engineering and Science", Masters, G. M., Prentice Hall India Pvt. Ltd.
3. "Fundamentals of Ecology", Odem, E. P., W. B. Sannders Co.

Reference Books:

1. "Biodiversity and Conservation", Bryant, P. J., Hypertext Book
2. "Textbook of Environment Studies", Tewari, Khulbe & Tewari, I.K. Publication

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

INDUSTRIAL ECOLOGY
Sixth Semester

Course Code: DIP603/DIP502	**L**	**T**	**P**	**C**
Course Content:	**4**	**-**	**-**	**4**

Unit I

Introduction to Industrial Psychology – definition, scope and importance. **(Lectures 08)**

Unit II

Motivation: Meaning, factors, motivation theories (Maslow, Herzberg and McGregor); understanding stress and its consequences, causes of stress, managing stress; group dynamics: features of group, group cohesiveness.

(Lectures 08)

Unit III

Work Environment: Design of work place; fatigue: causes and prevention, work place boredom, accidents and safety. Conflict: Concept, sources and types. **(Lectures 08)**

Unit IV

Constituents of Indian economy: Agriculture, Industry and Service; Innovation and Entrepreneurship: Industrial growth in India, role and challenges of small scale industries, sources of funding for small scale industries, industrial sickness.

(Lectures08)

Unit V

Privatization and globalization in India.
Problems of industry- technology, waste disposal, industrial law and dispute.

(Lectures08)

The question paper shall have weightage to case study 20% and to theoretical 80%.

Text Books:

1. Agarwal G.K. *"Social control and change"* Sahitya Bhawan Publication Agra.
2. Agarwal G.K. *"Social Disorganization"* Sahitya Bhawan Publication Agra.
3. Gillin & Gillin *"Cultural Sociology"* The Macmillian Company.
4. Denis. K *"Human Society"* Surjeet Publication Delhi.
5. Dewett, K.K., *"Modern Economic Theory"* S. Chand & Co.
6. Luthers Fred *"Organizational Behavior"*.

Reference Books:

1. Admas Bert N. *"A Sociological Interpretation"* Rand me Nally Chicago 1975.
2. Prasad L.M. *"Principles of Management".*
3. Stonier A.W. & D.C. Horgne, *"A Text Book of Economic Theory"*, Oxford Publishing House Pvt. Ltd.

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

REINFORCED CEMENT CONCRETE (RCC) LAB

Sixth Semester

Course Code: DCE654

L	T	P	C
-	-	6	3

Preparation of bar bending schedule and to bend the bars accordingly for the following:

1. Singly reinforced concrete beam.
2. Doubly reinforced concrete beam.
3. Reinforced concrete column.
4. Reinforced concrete slab.

Evaluation of Practical Examination:

Internal Evaluation (50 marks) :

Each sheet prepared would be evaluated by the faculty concerned on the date of preparing the sheet on a 5 point which would include the sheet drawn by the students and a Viva Voce taken by the faculty concerned. The marks shall be entered on the index sheet.

Evaluation Scheme :

EXPERIMENT (30 MARKS)	ATTENDANCE (10 MARKS)	VIVA (10MARKS)	TOTAL INTERNAL (50 MARKS)

External Evaluation (50 marks) :

The external evaluation would also be done by the external examiner based on the experiment conducted during the examination:

EXPERIMENT (30 MARKS)	FILE WORK (10 MARKS)	VIVA (10MARKS)	TOTAL EXTERNAL (50 MARKS)

DESIGN PROJECT ON CAD LAB

Sixth Semester

Course Code: DCE655	**L**	**T**	**P**	**C**
	-	**-**	**-**	**4**

Preparation of any such project:

1. Survey and soil investigation, planning, designing preparing working drawings, estimation and scheduling of a work for a small building including writing of Technical Report.
2. 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.
3. 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.
4. 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.
5. Selection of type & design for a culvert to be proposed over a river crossing a road. Preparation of working drawings, detailed estimate, schedule of work and writing of technical report.
6. Planning of small civil engineering work including designs, drawings, estimates and technical report writing.
7. Other problem with in syllabus including survey work, design, drawing, estimate and technical report writing.

The Faculty is supposed to take presentation of each group before awarding the marks.

Evaluation of Practical Examination:
Internal: 50 marks
Each sheet prepared would be evaluated by the faculty concerned on the date of preparing the sheet on a 5 point which would include the sheet drawn by the students and a Viva Voce taken by the faculty concerned. The marks shall be entered on the index sheet.

By the Faculty Guide - 25 marks
By Committee appointed by the Principal – 25 marks

External: 50 marks
By External examiner appointed by the University – 50 marks

Evaluation of Practical Examination: As per Annexure – A

ANNEXURE – A

Evaluation of Practical Examination:

EVALUATION CRITRIA (INTERNAL)

S. No.	Details	Marks (50)
1	**Regularity/Attendance**	**05**
2	**Performance of Practical/Skill/Creativity/Innovation**	**20**
3	**Knowledge, Findings and Results regarding practical conducted**	**10**
4	**File Presentation**	**05**
5	**Response to questions during Viva**	**10**
	Total (Out of 50)	

External examiner appointed by University shall conduct the practical along with internal faculty and shall assess out of 50 marks. The student would be required to complete an experiment during the practical examination and write the detail process, findings/ result and conclusions in the examination evaluation copy.

EVALUATION CRITRIA (EXTERNAL)

S. No.	Details	Marks (50)
1	**Performance of Experiment/ Practical and Observations taken**	**20**
2	**Result/ Conclusion**	**10**
3	**Records/ File Presentation**	**10**
4	**Viva – Voce**	**10**
	Total (Out of 50)	

Annexure – I

INDUSTRIAL TRAINING

After IVth semester examination in the summer vacation students will have a four week industrial training in small scale industry/training institute, on different stages of production, testing quality control and assurance, research & development and maintenance etc. They will work and tours their attention on following points to incorporate them in their report.

1. Name and Address of the organization:

2. (a) Date of Joining:
(b) Date ofLeaving:

3. Nature ofwork
(a) Product:
(b) Research & development:
(c) Maintenance:
(d) Working hours:

4. Details of work visited andactivities Going on-:

5. Details of Machine/Tools used in the Section of unit visited-:

6. Work procedure in the section visited:

7. Specifications of the product ofsection And materials used-:

8. Work of repair and maintenance cell:

9. Manner of keeping store items, their Receiving &distribution:

10. Safety measures on work placeand Working condition in general – Comfortableconvenient& hygienic:

Date:

Student Signature
Name
Class
Branch
Enrollment No.

Annexure – II

TRAINEE ASSESSMENT FORMAT

This institution invites the comments on the training of its students (work and behavior) from their immediate supervisors on the following points.

1. Name of the trainee

2. Date of

    - Joining
    - Leaving

3. i. Regularity & Punctuality
   ii. Sense ofresponsibility
   iii. Readiness to work/ learn
   iv. Obedience
   v. Skill acquired

4. Name of the works of the Department he attended during his stay.
   His activity/ worth of being there.

5. Anything specify.

Signature of the Assessor

Date: Designation