Study & Evaluation Scheme

of

Diploma in Electrical Engineering

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

TEERTHANKER MAHAVEER UNIVERSITY

Delhi Road, Moradabad, Uttar Pradesh-244001

Website: www.tmu.ac.in

TEERTHANKER MAHAVEER UNIVERSITY

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

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

Programme : Diploma in Engineering(Electrical)

Duration : 3 Years (Semester system)

Medium : English

Minimum Required Attendance : 75 %

Assessment (Theory and Project) :

Internal	External	Total
30+10 (Project)	60	100

Maximum Credit : **187**

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

Internal Evaluation (Theory Papers & Project) :

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

Evaluation of Practical/ Dissertation & Project Report :

Internal	External	Total
50	50	100

Duration of Examination :

Internal	External
1 ½ hrs.	3 hr.

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

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

Question paper structure

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

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

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

Semester- II

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

Semester- III

S. No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	DEE301	Electrical Circuits & Analysis	3	2	-	4	40	60	100
2	DEE302	Electrical Design, Drawing & Estimation – I	3	2	-	4	40	60	100
3	DEE303	Electro – Mechanical Energy Conservation Devices	3	2	-	4	40	60	100
4	DEE304	Electrical & Electronics Engineering Materials	3	2	-	4	40	60	100
5	DIP301	English Communication	2	-	2	3	40	60	100
6	DEE351	Electrical Circuits Lab	-	-	6	3	50	50	100
7	DEE352	Electrical Workshop	-	-	6	3	50	50	100
8	DEE353	Electro – Mechanical Energy Conservation Devices Lab	-	-	6	3	50	50	100
9	DEE355	Industrial Exposure	-	-	-	4	50	50	100
10	DGP301	Discipline and General Proficiency	-	-	-	1	100	-	100
Total			**14**	**8**	**20**	**33**	**500**	**500**	**1000**

Semester- IV

S. No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	DEE401	Electrical Instruments & Measurements	3	2	-	4	40	60	100
2	DEE402	Electrical Machines	3	2	-	4	40	60	100
3	DEE403	Control System	3	2	-	4	40	60	100
4	DEE404	Electrical Design, Drawing & Estimation – II	3	2	-	4	40	60	100
5	DIP401	Technical Communication	2	-	2	3	40	60	100
6	DEE451	Electrical Instruments & Measurements Lab	-	-	4	2	50	50	100
7	DEE452	Electrical Machines Lab	-	-	4	2	50	50	100
8	DEE453	Control System Lab	-	-	4	2	50	50	100
9	DCE454	Electrical Design, Drawing & Estimation – II Lab	-	-	8	4	50	50	100
10	DGP401	Discipline and General Proficiency	-	-	-	1	100	-	100
Total			**14**	**8**	**22**	**30**	**500**	**500**	**1000**

Semester- V

S. No.	*Course Code*	*Subject*	*Periods*			*Credit*	*Evaluation Scheme*		
			L	*T*	*P*		*Internal*	*External*	*Total*
1	DEE501	Power Electronics	3	2	-	4	40	60	100
2	DEE502	Switch Gear & Protection	3	2	-	4	40	60	100
3	DEE503	Power System	3	2	-	4	40	60	100
4	DEE504	Non-Conventional Energy Sources	3	2	-	4	40	60	100
5	DEE505	Environmental Education	3	-	-	3	40	60	100
6	DIP501	Communication Technique	2	-	2	3	40	60	100
7	DEE551	Power Electronics Lab	-	-	8	4	50	50	100
8	DEE552	Electrical Simulation Lab	-	-	8	4	50	50	100
9	DEE555	Industrial training	-	-	-	4	50	50	100
10	DGP501	Discipline and General Proficiency	-	-	-	1	100	-	100
Total			**17**	**8**	**18**	**35**	**490**	**510**	**1000**

Semester- VI

S. No.	*Course Code*	*Subject*	*Periods*			*Credit*	*Evaluation Scheme*		
			L	*T*	*P*		*Internal*	*External*	*Total*
1	DEE601	Installation & Maintenance of Electrical Equipments	3	2	-	4	40	60	100
2	DEE602	Microprocessors	3	2	-	4	40	60	100
3	DEE603	Utilization of Electrical Energy & Traction	3	2	-	4	40	60	100
4	DEE604	Generation of Electrical Power	3	2	-	4	40	60	100
5	DIP601	Corporate Communication	2	-	2	3	40	60	100
6	DEE651	Installation & Maintenance of Electrical Equipments Lab	-	-	4	2	50	50	100
7	DEE652	Microprocessors Lab	-	-	4	2	50	50	100
8	DEE653	Major Project	-	-	8	4	50	50	100
9	DGP.601	Discipline and General Proficiency	-	-	-	1	100	-	100
Total			**14**	**8**	**18**	**28**	**450**	**450**	**900**

APPLIED MATHEMATICS – I

First Semester

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

Course Contents:

Unit I

ALGEBRA-I

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

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

Unit II

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

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

Unit III

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

Unit IV

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

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

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

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

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

Unit V

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

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

Project work

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

Text Books:

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

Reference Books:

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

APPLIED PHYSICS
First/Second Semester

L	T	P	C
6	-	-	6

Course Code: DIP102/202
Course Contents:
Unit I
Vector: - Scalar and vector quantities: Addition, Subtraction, Resolution of vector- Cartesian components of vector, Scalar and vector product of two vectors.
Force and Motion: Parabolic motion, projectiles thrown horizontally and at an angle. Problems on time of flight, horizontal range, and maximum horizontal range. Central forces. Circular motion, angular velocity, angular acceleration and centripetal acceleration. Relationship between linear and angular velocity and acceleration. Centripetal and centrifugal forces. Practical applications of centripetal forces. Principle of centrifuge. Gravitational force, Motion of satellites, Kepler's laws, Escape velocity, Geostationary satellite, Concept of Black holes, Jet propulsion theory, Motion of Multi-stage Rocket, SLV, PSLV and GSLV Rockets. **(10 Lectures)**

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

Unit III
Elasticity: - Elasticity, stress and strain. Hook's law, elastic limit. Yielding point and breaking point. Modulus of elasticity Young's modulus, bulk modulus and modulus of rigidity, Poisson ratio, Resilience.
Simple Harmonic Motion: Periodic Motion, characteristics of simple harmonic motion; equation of S.H.M. and determination of velocity and acceleration. Graphical representation. Spring-mass system. Simple pendulum. Derivation of their periodic time. Energy conservation in S.H.M. Definition of free, forced, undamped and damped vibrations, Resonance and its sharpness, factor. **(10 Lectures)**

Unit IV
Application of Sound Waves:-
Acoustics:- Standing waves, Closed and Open organ pipes, Resonance, End correction. Definition of pitch, loudness, quality and intensity of sound waves. Echo and reverberation and reverberation time. Sabine's formula. Control of reverberation time (problems on reverberation time). Acoustics of building defects and remedy.
Optics: Quantum nature of light, Coherence (Spatial and temporal), Duality of wave and particle, Concept of Interference, Baptism, Fraunhofer single and N-slit diffraction, Grating, Resolving and dispersive power, Elementary concept of polarisation.
Magnetic Fields & Materials: Dia, Para and Ferro-magnetism, Ferrites, Hysteresis, Methods of plotting, Hysteresis curve of ferro magnetic materials and their uses, Magnetic circuits, Energy stored in magnetic fields. **(20 Lectures)**

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

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

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Text Books

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

Reference Books

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

APPLIED CHEMISTRY

First/Second Semester

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

Course Contents:

Unit I

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

Unit II

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

Unit III

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

Unit IV

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

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

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

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

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

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

Unit V

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

POLYMERS:

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

ii) Characteristics of Polymers and their classification

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

(16 Lectures)

Project work

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Text Books:

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

Reference Books:

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

BASICS OF ELECTRICAL AND CIVIL ENGINEERING
First/Second Semester

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

Course Contents:

Unit I

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

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

Unit II

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

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

Unit III

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

Basics of Civil Engineering

Unit IV

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

Unit V

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

(8 Lectures)

Unit VI

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

Project work

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Text Books:

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

Reference Books:

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

BASICS OF ELECTRONICS AND MECHANICAL ENGINEERING
First/Second Semester

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

Course Contents:

BASICS OF ELECTRONICS ENGINEERING

DETAILED CONTENTS:

Unit I

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

(8 Lectures)

Unit II

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

(8 Lectures)

Unit III

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

Basics of Mechanical Engineering

Unit IV

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

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

Unit V

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

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

(8 Lectures)

Unit VI

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

Project work

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Text Books

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

CONCEPTS IN INFORMATION TECHNOLOGY

First/Second Semester

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

Course Contents:

Unit I

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

Unit II

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

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

Unit III

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

Unit IV

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

Unit V

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

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

Project work

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Text Books

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

Reference Books

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

Applied Mechanics
First/Second Semester

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

Course Contents:

Unit I

Force Analysis: - System of forces, concept of coplanar and non-coplanar forces including parallel forces. Concurrent and non-concurrent forces, resultant forces, Equilibrium of forces, Law of parallelogram of forces, Law of triangle of forces and its converse, Law of polygon of forces, solution of simple engineering problems by analytical and graphical methods. Such as simple wall crane, jib crane etc. Determination of resultant of any number of forces in one plane acting upon a particle, Conditions of equilibrium of coplanar concurrent forces system. **(10 Lectures)**

Unit II

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

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

(10 Lectures)

Unit III

Friction: Types of friction: Stoical Limiting and dynamical friction statement of Laws of sliding friction, coefficient of friction, angle of friction: Problems on equilibrium of a body resting on a rough inclined plane, simple problems on friction, conditions of sliding and toppling. **(10 Lectures)**

Unit IV

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

Unit V

Beam and trusses; Definition of statically determinate and indeterminate trusses. Types of supports tie and struts, Bow's notation space diagram, polar diagram, funicular polygon, calculation of reaction at the support of cantilever and simply supported beams and trusses graphically and Analytically, Graphical solution of simple determinate trusses with reference to forces diagram for determining the magnitude and nature of forces in its various members Analytical method; Methods of joints and method of sections (Simple problems only). **(10 Lectures)**

Project work

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

Text Books

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

Reference Books:

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

Foundation English I
First Semester

Course Code: DIP108

L	T	P	C
2	0	2	3

Course Content:

Unit I

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

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

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

Unit II

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

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

Unit III

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

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

Unit IV

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

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

Recommended Books:

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

NOTE:

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

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

PHYSICS LAB

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

List of Experiments

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

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

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

Evaluation scheme:

<table>
<tr><td colspan="3">PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (40 MARKS)</td><td rowspan="2">VIVA
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<tr><td>EXPERIMENT
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(5 MARKS)</td></tr>
</table>

External Evaluation (50 marks)

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

CHEMISTRY LAB

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

LIST OF PRACTICAL

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

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

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

Evaluation scheme:

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External Evaluation (50 marks)

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

ELECTRICAL ENGINEERING LAB

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

PRACTICAL:

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

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

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

Evaluation scheme:

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External Evaluation (50 marks)

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

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ELECTRONICS ENGINEERING LAB

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

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

i) Silicon
ii) Germanium

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

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

Evaluation scheme:

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

INFORMATION TECHNOLOGY LAB

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

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

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

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

Evaluation scheme:

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External Evaluation (50 marks)

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

APPLIED MECHANICS LAB

Course Code: DIP156/256

L	T	P	C
0	0	4	2

LIST OF EXPERIMENTS

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

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

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

Evaluation scheme:

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External Evaluation (50 marks)

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

WORKSHOP PRACTICE

First/Second Semester

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

1. Carpentry Shop Work:

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

2. Painting and Polishing:

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

3. Sheet Metal Working and Soldering:

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

4. Fitting Shop:

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

5 A. Plumbing Work :

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

5 B. Foundry Shop Work :

Ex-1 Study & sketch of the foundry.

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

6. Smithy Shop work :

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

7. Welding Shop:

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

8. Machine Shop :

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

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

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

Evaluation scheme:

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<tr><td colspan="3">PRACTICAL PERFORMANCE & VIVA DURING THE SEMESTER (40 MARKS)</td><td rowspan="2">VIVA
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</table>

External Evaluation (50 marks)

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

ENGINEERING DRAWING

First/Second Semester

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

1. Drawing, instruments and their uses.

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

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

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

(b) Conventional Representation:

Types of lines, Conventional representation of materials.

3. Introduction to Scales **1 Sheet**

Necessity and use, R F

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

4. (a) Principles of Projection

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

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

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

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

6. Section of Solids **1 Sheet**

Concept of sectioning

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

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

7. Development of Surfaces **1 Sheet**

Parallel line and redial line methods of development.

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

8. Isometric Projection. **1 Sheet**

Isometric scale

Isometric Projection of solids.

9. ORTHOGRAPHIC PROJECTION : **1 Sheet**

Nut and Bolt, Rivets and Riveted Joints.

10. PRACTICE ON AUTO CAD:

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

Text Books:

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

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

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

Evaluation scheme:

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

External Evaluation (50 marks)

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

DISCIPLINE & GENERAL PROFICIENCY

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

L	T	P	C
0	0	0	1

Guidelines

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

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

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

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

APPLIED MATHEMATICS – II

Second Semester

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

Course Contents:

Unit I

DIFFERENTIAL CALCULUS:

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

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

(10 Lectures)

Unit II

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

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

Unit III

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

Unit IV

Integral Calculus:

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

Unit V

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

(10 Lectures)

Project work

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

Ref Books:

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

Text Books:

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

APPLIED PHYSICS

Second/First Semester

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

Course Contents:

Unit I

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

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

(10 Lectures)

Unit II

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

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

(10 Lectures)

Unit III

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

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

(10 Lectures)

Unit IV

Application of Sound Waves:-

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

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

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

Unit V

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

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

(10 Lectures)

Project work

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

Text Books

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

Ref Books:

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

APPLIED CHEMISTRY

Second/First Semester

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

Course Contents:

Unit I

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

Unit II

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

Unit III

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

Unit:- IV

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

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

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

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

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

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

Unit:- V

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

POLYMERS:

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

ii. Characteristics of Polymers and their classification

- Addition polymers and their industrial application – Polystyrene, PVC, PAN, Buna-S, Teflon.
- Condensation polymer and their industrial application: Nylon 6, Nylon 6, 6, Bakelite. **(16 Lectures)**

Project work

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

Text Books:

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

Reference Books:

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

BASICS OF ELECTRONICS AND MECHANICAL ENGINEERING

Second/First Semester

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

Course Contents:

BASICS OF ELECTRONICS ENGINEERING

Unit I

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

(8 Lectures)

Unit II

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

(8 Lectures)

Unit III

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

Basics of Mechanical Engineering

Unit IV

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

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

Unit V

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

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

(8 Lectures)

Unit VI

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

Project work

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

Text Books

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

BASICS OF ELECTRICAL AND CIVIL ENGINEERING

Second/First Semester

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

Course Contents:

Unit I

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

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

Unit II

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

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

Unit III

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

Basics of Civil Engineering

Unit IV

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

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

Unit V

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

Unit VI

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

Project work

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

Text Books:

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

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.

Applied Mechanics

Second/First Semester

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

Course Contents:

Unit I

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

(10 Lectures)

Unit II

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

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

(10 Lectures)

Unit III

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

(10 Lectures)

Unit IV

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

Unit V

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

(10 Lectures)

Project work

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

Text Books

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

4. Yadav K.S., *Engineering Mechanics*, Vayu Education of India.

Reference Books:

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

CONCEPTS IN INFORMATION TECHNOLOGY

Second/First Semester

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

Course Contents:

Unit I

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

Unit II

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

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

Unit III

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

Unit IV

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

Unit V

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

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

(Lectures 08)

Project work

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

Text Books

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

Reference Books

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

Foundation English –II

Second Semester

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

Course Content:

Unit I

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

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

Unit II

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

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

Unit III

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

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

Unit IV

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

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

Recommended Books:

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

NOTE:

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

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

PHYSICS LAB

Second/First Semester

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

List of Experiments

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

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

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

Evaluation scheme:

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

External Evaluation (50 marks)

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

CHEMISTRY LAB

Second/First Semester

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

LIST OF PRACTICAL

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

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

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

Evaluation scheme:

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External Evaluation (50 marks)

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

ELECTRONICS ENGINEERING LAB

Second/First Semester

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

LIST OF PRACTICAL

Practical No.- 1

Object :- To study, Identification & testing of passive Components, Resistor Compactor.

Practical No.- 2

Object:- Draw the V-I characteristics of P-N Junction Diode in forward and reverse Bias.

iii) Silicon

iv) Germanium

Practical No.- 3

Object :- Draw the input and output wave form of Half wave rectifier using semi conductor diode.

Practical No.- 4

Object :- Draw the input and output wave form of full wave rectifier using semi conductor diode.

Practical No.- 5

Object :- Draw input and output characteristics of Transistor in common base configuration.

Practical No.- 6

Object :- Draw the V-I characteristics of zener diode.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

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

Evaluation scheme:

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External Evaluation (50 marks)

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

ELECTRICAL ENGINEERING LAB

Second/First Semester

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

PRACTICALS:

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

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

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

Evaluation scheme:

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External Evaluation (50 marks)

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

INFORMATION TECHNOLOGY LAB

Second/First Semester

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

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

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

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

Evaluation scheme:

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</table>

External Evaluation (50 marks)

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

APPLIED MECHANICS LAB

Course Code: DIP256/156

L	T	P	C
0	0	4	2

LIST OF EXPERIMENTS

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

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

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

Evaluation scheme:

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External Evaluation (50 marks)

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

ENGINEERING DRAWING

Second/First Semester

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

1. Drawing, instruments and their uses.

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

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

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

(b) Conventional Representatfion:

Types of lines, Conventional representation of materials.

3. Introduction to Scales **1 Sheet**

Necessity and use, R F

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

4. (a) Principles of Projection

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

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

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

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

6. Section of Solids **1 Sheet**

Concept of sectioning

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

7. Development of Surfaces **1 Sheet**

Parallel line and redial line methods of developments.

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

8. Isometric Projection. **1 Sheet**

Isometric scale

Isometric Projection of solids.

9. ORTHOGRAPHIC PROJECTION : **1 Sheet**

Nut and Bolt, Rivets and Riveted Joints.

10. PRACTICE ON AUTO CAD:

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

Text Books:

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

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

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

Evaluation scheme:

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

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

WORKSHOP PRACTICE

Second/First Semester

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

1. Carpentry Shop Work:

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

1. Painting and Polishing:

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

2. Sheet Metal Working and Soldering:

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

3. Fitting Shop:

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

5 A. Plumbing Work :

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

5 B. Foundry Shop Work :

Ex-1 Study & sketch of the foundry.
Ex-2 Study & sketch of Copula & Pit Furnace.
Ex-3 To Prepare the green moulding sand and to prepare moulds (single piece and double piece pattern sweep mould).
Ex-4 Casting of non ferrous (lead or aluminum) as per exercise 3.

6. Smithy Shop work :

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

7. Welding Shop:

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

8. Machine Shop :

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

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

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

Evaluation scheme:

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

External Evaluation (50 marks)

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

ELECTRICAL CIRCUIT AND ANALYSIS

Third Semester

	L	T	P	C
Course Code: DEE301	**3**	**2**	**-**	**4**

Course Contents

Unit I

D.C. Network Theory (with independent source): Circuit theory concepts-Mesh and node analysis. Network Theorems- Super-position theorem. Thevenin's theorem, Norton's theorem, Maximum Power Transfer theorem, Star Delta transformation. **(Lectures 08)**

Unit II

D.C. Network Theory (with dependent source): -Mesh and node analysis. Network Theorems- Super-position theorem. Thevenin's theorem, Norton's theorem. **(Lectures 08)**

Unit III

A.C network Theory: Review on basic of R-L-C circuits on AC.Superposition theorem, Thevenin's theorem, Norton's theorem, Maximum transfer theorem. **(Lectures 08)**

Unit IV

Resonance: Resonance in series RLC circuit, waveforms for voltage, current, Power Factor and impedence, Quality factor, expression for quality factor, selectivity, resonance in parallel RLC circuit. **(Lectures 08)**

Unit V

Phase A.C. Circuits: Star-Delta connections, line and phase voltage/current relations, three phase power and its measurement. **(Lectures 08)**

Project work

A project work will be 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/her practical skill & knowledge.

Text books:

1. Hayt W H, Kemmerly J E, McGraw-Hill, "*Engineering Circuit Analysis*", 2002
2. Nilsson J W, Riedel S A, "*Electric Circuits*", Prentice-Hall, 2000.

Reference Books:

1. Asfaq Hussain "Network Analysis and synthesis", Dhanpat Rai
2. J.B.Gupta *"Basic Electrical Engineering"* , Kataria & Sons.

ELECTRICAL DESIGN, DRAWING & ESTIMATING-I

Third Semester

	L	T	P	C
Course Code: DEE302	**3**	**2**	**-**	**4**

Course Contents

Unit: - I

Electrical Symbols and Diagrams:

(i) Need of symbols; List of symbols for electrical equipments and accessories used in electrical works.

Light, fan and power circuits, alarm and indicating circuit, contactor control circuits as per I.S.S.

(ii) Type of diagrams - Wiring diagrams (multiple and single line representation) and schematic diagrams as per I.S.S.(* One Drawing Sheet for at least - 50 symbols)**.** **(8 Lectures)**

Unit:- II

Wiring materials and accessories:

(1) Brief description, general specifications (as per I.S.S.) and approximate cost of different types of wires, cables, switches, distribution board, switch board, boxes, batten and its accessories, conduit and its accessories, lamp holders, socket out lets, plug ceiling roses. Fuse and energy meter used in domestic and power wiring installations.

(ii) Brief description, general specifications and approximate cost of switches, push buttons, bells, indicating lights, indicating panels, relays used in alarm circuits. **(8 Lectures)**

Unit:- III

Light and Fan Circuits:

Schematic and wiring diagrams (multiline and single line both) using junction boxes and looping systems for the following types of circuits:-

(i) Light and fan controlled by necessary switches and regulators.

(ii) Stair case wiring

(iii) Corridor lighting

(iv) One lamp controlled by three or more switches. **(8 Lectures)**

Unit:- IV

Estimation of Domestic Internal Wiring Circuits:

(i) Description of various wiring systems and methods.

(ii) Need of earthing and point to be earthed in internal wiring system as per IE rules.

(iii) I.S. specifications, calculation of No. of points (light, fan, socket outlet), calculation of total load including domestic power, determination of no. of circuits, size of wires and cables, switches and main switch, distribution board and switch board, batten conduit and other wiring accessories.

(iv) Layout of installation plan, single line wiring, diagram, calculation of length of batten/conduit of different sizes and wire length; schedule of materials. **(8 Lectures)**

Unit:- V

Assembly Drawings:-

(i) Assembly drawing of simple electrical equipment from actual piece or from a pictorial view (carbon brush holder, open knife switch, miniature circuit breaker, motor terminal block, and similar other electrical items) (2-Drawing sheets)

(ii) Poles, towers cables and insulators (2- Drawing sheets) **(8 Lectures)**

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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/her practical skill & knowledge.

Text Books:

1. S.K Bhattacharya, *"Electrical Engineering Drawing & Design Estimating"*. Wiley Eastern Ltd. New Delhi.
2. Surjeet Singh, *"Electrical Eesign & Drawing"* S.K.Kataria & Sons New Delhi.

Reference Books:

1. O. P. Soni,*" Electrical Engg. Design & Drawing*" Satya Prakashan Delhi.

ELECTRO-MECHANICAL ENERGY CONSERVATION DEVICES

Third Semester

	L	T	P	C
Course Code: DEE303	**3**	**2**	**-**	**4**

Course Contents:

Objective: This paper develops methodology in the experimental research of the dynamics of electromechanical pulse energy conversion systems (PECSs)

Course Contents

Unit I

D.C. Machines: Principle of electromechanical energy conversion, types of d.c. machines, E.M.F. equation, Magnetization and load characteristics, losses and efficiency, need of Starter, three point starter and speed control of DC motors, their applications. **(Lectures 08)**

Unit II

Transformer(single phase): Principle of operation, types of construction, phasor diagram, equivalent circuit, efficiency and voltage regulation of single phase transformer, O.C. and S.C. tests. **(Lectures 08)**

Unit III

Transformer (Three phase): Three – phase unit transformer and Bank of three single phase transformers with their advantages, Three-phase transformer Groups (Phasor groups) and their connections. **(Lectures 08)**

Unit IV

Three phase induction Motor: Principle of operation, types and methods of starting, slip-torque characteristics, and applications.

Synchronous Machines: Principle of Operation of Alternator and synchronous motor. **(Lectures 08)**

Unit V

Single phase Motors:

Principle of operation and methods of starting of single phase induction motor, capacitor start motor, capacitor start capacitor run motor, split phase motor, shaded pole motor and Universal motor. **(Lectures 08)**

Project work

A project work will be 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/her practical skill & knowledge.

Text Books

1. Asfaq Hussain "Basic Electrical Engineering", Dhanpat Rai
2. Nagrath I.J., *Basic Electrical Engineering*, Tata McGraw Hill.

Reference Books

1. A.E. Fitgerald, D.E., Higginbotham and A Grabel, *Basic Electrical Engineering*, McGraw Hill.
2. H. Cotton, *Advanced Electrical Technology*, Wheeler Publishing.

ELECTRICAL AND ELECTRONICS ENGINEERING MATERIALS

Third Semester

	L	T	P	C
Course Code: DEE304	**3**	**2**	**-**	**4**

Objective: The objective is to study about materials used in electrical engineering equipment.

Course Contents:

Unit I

Classification

Classification of materials into conducting, semiconducting and insulating materials with reference to their atomic structure and energy bands.

Conducting Materials: Resistivity and factors affecting resistivity, such as temperature, alloying. Super conductivity and super conducting material. Low resistivity materials e.g. copper, aluminum and steel, their general properties as conductor e.g. resistivity, temperature co-efficient, mechanical properties, corrosion, solar ability, contact resistance and practical application. High resistivity materials: manganin, carbon, tungsten, their practical applications**.** **(8 Lectures)**

Unit- 2

Insulating Materials

Properties of insulating material:- Electrical properties, Mechanical properties, Physical properties, Thermal properties, Chemical properties, Insulating materials and their application-Definition and classification of Thermo setting materials e.g. Phenol Formaldehyde, Resins (i.e. Bakelite), Thermo Plastic materials e.g. Polyvinyl Chloride (P.V.C.), ,Natural Insulating Materials- Mica and Asbestos,Gaseous Materials e.g. Air, Hydrogen and SF6. **(8 Lectures)**

Unit-3

Magnetic Materials:

B-H curve of magnetic materials, Classification of magnetic materials into soft and hard magnetic materials. Soft magnetic materials - high silicon alloy steel for transformers and low silicon alloy steel, for electric rotating machine cold rolled grain oriented and non-oriented steel, Nickel iron alloy, soft ferrites, their properties and uses. Hard magnetic materials - tungsten steel, chrome steel, cobalt steel, hard ferrites, their properties and applications. **(8 Lectures)**

Unit-4

Semiconductor Materials

Introduction, semiconductor and their applications, Different semiconductor materials used in manufacturing various semiconductors (Si & Ge), Material used for electronic components like resister, capacitor, diode, transistors and inductors. **(8 Lectures)**

Unit-5

Special Purpose Materials:

Thermocouple, bimetals, lead soldering and fuses material, mention their applications, Introduction of various engineering materials necessary for fabrication of electrical machines such as motors, generators, transformers etc. **(8 Lectures)**

Project work

A project work will be 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/her practical skill & knowledge.

Text Books:

1. Bhattacharya SK*, Electrical and Electronics Engineering Materials*, Khanna Publishers New Delhi.

2. Grover and Jamwal, *Electronics Components and Materials*, Dhampat Rai and Co. New Delhi.
3. Dhir SM, *Electrical Engineering Materials*, Tata Mc Graw Hill, New Delhi.

Reference Books:

1. Kapoor PL, *Electrical Engineering Materials*, Khanna Publishers, New Delhi.
2. Sharma BR and Others, *Electrical and Electronics Engineering Materials*, Sayya Parkashan.
3. DR. Arora, *Electrical and Electronics Engineering Mate*rials, Ishan Publications, Ambata City.
4. Dogra Rakesh, *Electrical Engineering Materials*, SK Kataria and Sons, New Delhi.

ENGLISH COMMUNICATION

Third Semester

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

Course Content:

Unit I

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

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

Unit II

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

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

Unit III

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

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

Unit IV

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

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

Recommended Books:

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

NOTE:

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

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

ELECTRICAL CIRCUIT LAB

Third Semester

	L	T	P	C
Course Code: DEE351	**-**	**-**	**6**	**3**

LIST OF EXPERIMENTS

(Minimum of Six experiments should be done)

1. Determine the loop currents in any DC network
2. Determine the node voltages in any DC network
3. Verification of principle of superposition with DC sources.
4. Verification of Thevenin, theorems in DC circuits
5. Verification of Norton theorems in DC circuits
6. Verification of Maximum power transfer theorems in DC circuits
8. Study of RLC series resonance
9. Study of RLC Parallel resonance

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

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

Evaluation scheme:

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

External Evaluation (50 marks)

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

ELECTRICAL WORKSHOP
Third Semester

	L	T	P	C
Course Code: DEE352	**-**	**-**	**6**	**3**

LIST OF EXPERIMENTS

1. Study the construction, working & circuit of the following: Fluorescent lamp (tube light), Sodium vapour lamp, Mercury vapour lamp, Halogen lamp and Neon lamp.
2. Make the tube light connection and to measure the following: Power factor of the circuit, Voltage across the tube, Voltage across the chock, Power drawn by the circuit form the supply to draw phasor diagram for the circuit.
3. Importance of wire joints, mechanism of failure of joint, methods of minimizing joint failures. Importance of lugs in joints, bus bars, methods of reducing the contact/join resistance, How to join the dissimilar metal joints, Use of multimeter and meggar.
4. (a) Study the different types of wires and wiring accessories.
   (b) To make the house wiring for the following : ?House wiring having 3 fans, 2 tube lights, one – 3 pin socket, and one lamp showing the ear thing of each appliance.
5. Make the circuit for staircase wiring.
6. Assemble and disassemble a table fan & ceiling fan. To learn about their nature of winding, No. Of poles and starting capacitor. To draw winding diagrams and phasor diagram.
7. Study the various types of earthing for electrical appliances/systems, Practice of earthing.
8. Study the construction & working of single-phase transformer & design a small single-phase transformer of given rating.

Evaluation of Practical Examination:

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

Evaluation scheme:

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

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

ELECTRO-MECHANICAL ENERGY CONSERVATION DEVICES LAB

Third Semester

	L	T	P	C
Course Code: DEE353	**-**	**-**	**6**	**3**

LIST OF EXPERIMENTS

1. To obtain load characteristics of a DC shunt and series generator
2. To obtain load characteristics of a DC compound generator
(a) cumulatively compounded
(b) differentially compounded
3. To obtain speed – torque characteristics of a DC shunt motor
4. Speed control of DC shunt motor by field control
5. Speed control of DC shunt motor by armature control
6. To obtain efficiency & voltage regulation of a single phase transformer
7. O.C and S.C test in a single phase transformer
8. To obtain the V curve of the synchronous motor
9. Study of single phase induction starting
10. Load test on three phase induction motor

Evaluation of Practical Examination:

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

Evaluation scheme:

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

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

INDUSTRIAL EXPOSURE

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

Students will undergo Industrial exposure of two to three weeks in any industry or reputed organization after the II semester examination in summer vacation. The evaluation of this training shall be included in the III semester evaluation.

The student will be assigned a faculty guide who would be the supervisor of the student. The faculty would be identified before the end of the II semester and shall be the nodal officer for coordination of the training.

Students will also be required to prepare an exhaustive technical report of the exposure during the III semester which will be duly signed by the officer under whom training was taken in the industry/ organization. The covering format shall be signed by the concerned office in-charge of the training in the industry. The officer-in-charge of the trainee would also give his rating of the student in the standard University format in a sealed envelope to the Principal of the Polytechnic.

The student at the end of the III semester will present his report about the training before a committee constituted by the Principal of the Polytechnic which would be comprised of at least three members comprising of the Department Coordinator, Class Coordinator and a nominee of the Principal. The students guide would be a special invitee to the presentation. The seminar session shall be an open house session. The internal marks would be the average of the marks given by each member of the committee separately in a sealed envelope to the Principal.

The marks by the external examiner would be based on the report submitted by the student which shall be evaluated by the external examiner and cross examination done of the student concerned.

Not more than three students would form a group for such industrial exposure submission.

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

ELECTRICAL INSTRUMENTS AND MEASUREMENTS

Fourth Semester

	L	T	P	C
Course Code: DEE401	**3**	**2**	**-**	**4**

Objective: The objective is to study about electrical and electronics instruments used for measurement of electrical parameters.

Course Contents

UNIT-1

Introduction to electrical measuring instruments: Electrical quantities and instruments for their measurements. Measurement and Errors, Accuracy, precision, types of errors, sensitivity, resolution and stability. Types of electrical measuring instruments, indicating, integrating and recording instruments. Essentials of indicating instruments, deflecting, controlling and damping torques.

(8 Lectures)

UNIT-2

Ammeters and voltmeters: Construction and working principle of moving coil moving iron instruments. Merits and demerits, Instrument Transformer and their application in the extension of instrument range and simple problems. **(8 Lectures)**

UNIT-3

Wattmeter and Energy Meter: Construction, working principle, merits and demerits of dynamometer type wattmeter, Sources of errors, Power measurement in three phase circuit by two wattmeter and three wattmeter methods, simple problems, Energy meter (Induction type), Construction, working principle, merits and demerits of single-phase Energy meter.

(8 Lectures)

UNIT-4

Parameter Measurements:

Phase sequence indicator, Synchronoscope, Different methods of measuring low, medium and high Resistance Inductance and Capacitance using Maxwell bridge, Wein's bridge and Schering bridge, potentiometers. **(8 Lectures)**

UNIT-5

Miscellaneous Measuring Instruments:

The construction, working principle and application of ohm-meter, meggar, earth tester, multimeter, frequency meter (reed-type) single phase power factor meter (Electrodynamometer type), Cathode Ray Oscilloscope, construction, working of various controls of CRO. **(8 Lectures)**

Project work

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Text Book:

1. Golding E.W. & F.C. Widdis, A.W. Wheeler "*Electrical Measurement & Measuring Instrument*", & Co. Pvt. Ltd. India.
2. Sawhney A.K., Dhanpat Rai & Sons, India *"Electrical & Electronic Measurement & Instrument",* .

Reference Books:

1. Forest K. Harries "*Electrical Measurement*", , Willey Eastern Pvt. Ltd. India .
2. Stout" M.B. "*Basic Electrical Measurement*, Prentice hall of India ,India.
3. Cooper W.D. "*Electronic Instrument & Measurement Technique*", , prentice hall International.
4. Prashad Rajendra "*Electrical Measurement &Measuring Instrument*", , Khanna Publisher.

Gupta J.B. "*Electrical Measurements and Measuring Instruments*", S.K. Kataria &

ELECTRICAL MACHINES
Fourth Semester

	L	T	P	C
Course Code: DEE402	**3**	**2**	**-**	**4**

Course Contents:

Unit I

Induction Motor:-

Rotating magnetic field for 3 phase concept of motors and its reversing. Construction and working of 3 phase induction motor (squirrel cage and wound rotor motor). Double squirrel cage induction motor. Rotor frequency, rotor e.m.f., rotor current and rotor power factor. Torque equation Torque- slip characteristics. Principle and methods of speed control. Methods of starting of induction motor. On line, auto transformer, star delta manual/automatic starters for induction motor. Starter for slip ring induction motor. Application of induction motor. **(8 Lectures)**

Unit II

Synchronous Motor:-

Construction, working principle, effect of load on synchronous motor, vector diagram of synchronous motor, effect of change in excitation on the performance of synchronous motor, V curves, torque & mechanical power developed, condition for max. mechanical power, synchronous condenser, hunting and its elimination, comparison between induction motor and synchronous motor, starting methods and uses of synchronous motor. **(8 Lectures)**

Unit:- III

F.H.P. Motors:-

Classification of F.H.P. motors, Production of rotating Magnetic field in 1 phase motors., Double revolving field theory, Construction working and application of- **(i)** Capacitor motor (all types), **(ii)** Shaded pole motor, **(iii)** 1 phase synchronous motor, **(iv)** 1 phase series and universal motor, **(v)** Servo Motor. **(8 Lectures)**

Unit:- IV

Electric Drives:-

Advantages of electric drives, Characteristics of different mechanical loads., Types of motors used in electric drive, Use of fly wheels for fluctuating load (only physical concept), Types of enclosures, Methods of power transfer by devices like belt drive, gears, pulley, Examples of selection of motors for particular loads. **(8 Lectures)**

Unit:- V

Converting Apparatus:-

Introduction to different types of converting apparatus e.g. metal rectifier etc. **(8 Lectures)**

Project work

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Text Books

1. Asfaq Hussain "*Basic Electrical Engineering",* Dhanpat Rai
2. Nagrath I.J., *Basic Electrical Engineering*, Tata McGraw Hill.

Reference Books

1. A.E. Fitgerald, D.E., Higginbotham and A Grabel, *Basic Electrical Engineering*, McGraw Hill.
2. H. Cotton, *Advanced Electrical Technology*, Wheeler Publishing.

CONTROL SYSTEM
Fourth Semester

	L	T	P	C
Course Code: DEE403	**3**	**2**	**-**	**4**

Objective: The objective is to study about theory of control system and its various system representations

Course Contents

UNIT-1.

Introduction: Need of automatic control, Concept of open loop and closed loop control, Block diagram of feedback control system and its basic elements, relative advantages and disadvantages of open loop and closed loop control system, definition and explanation of given control system: Linear and Non-Linear Systems, Continuous and discrete Systems, Static and Dynamic Systems, Single Input Single Output (SISO) System and Multi-input Multi-output (MIMO) System. **(Lectures 08)**

UNIT-2

Components & Devices Used In Control System:

Brief description and working of potentiometer, self balancing potentiometer, differential transformer, synchros, servomotors, tacho generators, saturable core reactor and magnetic amplifier. **(Lectures 08)**

UNIT-3

Input Output Relationship of System & Control system Components:

Concept of transfer function and its use in control system, Derivation of transfer function of given systems: Simple RC low pass network, Lag, Lead, Lag-Lead compensating networks, DC servomotor and DC Tachogenerator, derivation of transfer function by block reduction technique and signal flow graph. **(Lectures 08)**

UNIT-4

Performance of Control System:

Step, Ramp, Pulse and sinusoidal type of inputs and their Laplace Transforms, Definitions of Rise time, Peak overshoot, Settling time, Natural frequency and Damping Ratio pertaining to second order system, Initial value and final value theorems and their use in control systems, Types of feedback systems and error constants. **(Lectures 08)**

UNIT-5

Stability Criterion:

Bounded Input and Bounded Output (BIBO) System, Concept of Stability, stability criteria, different techniques of determining stability e.g. Routh, Nyquist criteria, bode plot and their applications to simple system. Electric Controller: On-OFF controller, Proportional, Proportional plus integral (PI), Proportional plus integral plus derivative (PID) controllers. **(Lectures 08)**

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Text Books:

1. Norman S. Mise "*Control System Engineering*",Wiley Publishing Co.
2. M.Gopal, "*Control System; Principle and design*", Tata McGraw Hill.
3. M.Gopal, "*Modern Control system*", Tata McGraw Hill.
4. D.Roy Choudhary, "*Modern Control Engineering*",Prentice Hall of India.

Reference Books:

1. I.J. Nagrath and M. Gopal –Control Systems Engineering, 3rd Ed., New Age Publication
2. K. Atsuhiko Ogata: Modern Control Engineering, PHI

ELECTRICAL DESIGN DRAWING & ESTIMATING II
Fourth Semester

	L	T	P	C
Course Code: DEE404	**3**	**2**	**-**	**4**

Course Contents:

Unit:- I

Principles of Estimating and Costing:

Purpose of estimating and costing, essentials of estimating and costing-market survey, price list and net prices, preparation of list of materials, calculation of material and labour cost, contingencies, overhead charges, profit and total cost, quotations-comparative statement and orders, idea about tender forms. Use of E.S.R (state PWD and CPWD). **(8 Lectures)**

Unit:- II

Earthing:-

Need for earthing of electrical installations, advantages and disadvantages, effect of improper earthing, I.S. specifications regarding earthing of electrical installations, points to be earthed as per I.E. rules. Methods of earthing-plate and pipe earthing. Determination of size of earth wires and earth plates for different capacities of electrical installations, specification of earthing materials and their cost, Earthing of power plant and grid substation. **(8 Lectures)**

Unit:- III

Estimation of Power Wiring:-

I.S. specifications and I.E. rules, calculation of current for single and three phase motors. Determination of sizes of cables, conductors distribution board, main switches and starters for power circuits. Cost of equipments and accessories and schedule of materials. Estimation and cost of material and work for motors up to 20 H.P., pump sets and small workshops. **(8 Lectures)**

Unit:- IV

Estimation of Overhead and Underground Distribution Lines:-

Main components of overhead lines-line supports, cross-arm, clamps, conductors and stay sets, lightening arrestors, danger plates, ant climbing devices, bird guards, jumpers etc., concreting of poles, earthing of transmission line, formation of lines, specification of materials for O.H. lines, I.S. specification and I.E. rules. Cost of material and work for overhead and underground lines upto 11 KV only. **(8 Lectures)**

Unit:- V

Estimation of Small Sub-Station

Main equipments and auxiliaries installed on the substation. Estimation of materials required for a small distribution substation (indoor and outdoor type-platform and pole mounted). Costing of material and work of above substations. **(8 Lectures)**

Project work

A project work will be 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/her practical skill & knowledge.

Text Books:

1. S.K Bhattacharya, "*Electrical Engineering Drawing & Design Estimating".* Wiley Eastern Ltd. New Delhi.
2. Surjeet Singh, *"Electrical Eesign & Drawing*" S.K.Kataria & Sons New Delhi.

Reference Books:

1. O. P. Soni*," Electrical Engg. Design & Drawing*" Satya Prakashan Delhi.

TECHNICAL COMMUNICATION
Fourth Semester

Course Code: DIP 401

L	T	P	C
2	0	2	3

Course Content:

Unit I

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

Practical (oral):

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

Unit II

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

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

Unit III

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

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

Unit IV

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

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

Recommended Books:

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

NOTE:

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

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

ELECTRICAL INSTRUMENTS AND MEASUREMENTS LAB

Fourth Semester

	L	T	P	C
Course Code: DEE451	**-**	**-**	**4**	**2**

List of Experiments

1. Calibration of ammeter and voltmeter
2. Measurement of self inductance by Maxwell bridge
3. Measurement of self inductance by Hay bridge
4. Measurement of self inductance by Owen,s bridge
5. Measurement of self Capacitance by Schering bridge
6. Low resistance measurement by Kelvin,s Double Bridge
7. To study the CRO function

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

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

Evaluation scheme:

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

External Evaluation (50 marks)

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

ELECTRICAL MACHINE LAB
Fourth Semester

	L	T	P	C
Course Code: DEE452	**-**	**-**	**4**	**2**

List of Experiments

1. To determine performance characteristics of a polyphase induction motor. (load v/s efficiency, load v/s power factor, load v/s slip)
2. To start a 3 phase induction motor and to determine its slip at various loads.
3. To connect and start an induction motor by using star delta starter, auto transformer starter, rotor starter and to change its direction of rotation.
4. To perform open circuit and block rotor test on a 3 ph. induction motor and to determine its efficiency.
5. Determination of performance curve and hence the coreloss of a single phase series motor.
6. Voltage and current ratio of metal rectifier.
7. Sequential operation of motors using timers.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

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

Evaluation scheme:

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

External Evaluation (50 marks)

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

CONTROL SYSTEM LAB
Fourth Semester

	L	T	P	C
Course Code: DEE453	**-**	**-**	**4**	**2**

LIST OF EXPERIMENTS

1. To determine response of first order and second order systems for step input for various values of constant 'K' using linear simulator unit and compare theoretical and practical results.
2. To study P, PI and PID temperature controller for an oven and compare their performance.
3. To study and calibrate temperature using resistance temperature detector (RTD)
4. To design Lag, Lead and Lag-Lead compensators using Bode plot.
5. To study DC position control system
6. To study synchro-transmitter and receiver and obtain output V/S input characteristics
7. To determine speed-torque characteristics of an AC servomotor.
8. To study performance of servo voltage stabilizer at various loads using load bank.
9. To study behaviour of separately excited DC motor in open loop and closed loop conditions at various loads.
10. To study PID Controller for simulation proves like transportation lag.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

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

Evaluation scheme:

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

External Evaluation (50 marks)

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

ELECTRICAL DESIGN, DRAWING & ESTIMATING II LAB

Fourth Semester

	L	T	P	C
Course Code: DEE454	**-**	**-**	**8**	**4**

DRAWING WORK:-

1.	Earthing	**1 sheet**
2.	Commercial and industrial buildings	**1 sheet**
3.	Power wiring layout and circuits	**1 sheet**
4.	Stays, line crossings, line earthing, end poles and terminal poles, junction poles/ towers and transposition pole/towers.	**1 sheet**
5.	Substation layout and busbar arrangements	**1 sheet**
6.	Machine drawings-induction and synchronous machines.	**1 sheet**
7.	Winding of induction machine, 3 ph; 1 ph.	**1 sheet**
8.	Reading and interpreting practical drawing of wiring installation and control circuits.	

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

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

Evaluation scheme:

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

External Evaluation (50 marks)

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

POWER ELECTRONICS
Fifth Semester

	L	T	P	C
Course Code: DEE501	**3**	**2**	**-**	**4**

Objective: The objective is to study about basic of power electronics in electrical engineering.

Course Contents

UNIT-1

Thyristors : Construction, characteristics (forward and reverse characteristic), concept of holding and latching current, and application of SCR, triggering of SCR, methods of triggering a SCR, Gate characteristics, General layout of gate triggering circuits,R, R-C, UJT firing circuit,. Commutation of SCR, methods of commutating a SCR, Series and Parallel operation of SCR, Protection of SCR against over voltage, over current, dv/dt and di/dt protection. **(Lectures 08)**

UNIT-2

Power Transistors and Thyristors: Characteristics and application of Bipolar Junction Transistor, Power MOSFET (enhancement type), UJT, Gate Turn off thyristor (GTO), Light activated SCR (LASCR) and reverse conducting SCR, Characteristics and applications of Diac and Triac.

(Lectures 08)

UNIT-3

CONTROLLED RECTIFIERS: Phase controlled rectifier operation on resistive and resistive inductive loads, Use of freewheeling diode. Single phase controlled and fully controlled bridge rectifiers, expression for average and rms value of output voltage, Simple numerical problems on controlled rectifiers. **(Lectures 08)**

UNIT-4

CHOPPERS: Principle of chopper operation, Control strategies, Step up/down Copper, Chopper configuration, Chopper commutation, Chopper firing circuit, Step up chopper and its applications, expression for average and rms value of output voltage, simple numerical problems.

(Lectures 08)

UNIT-5

INVERTERS: Single phase series and parallel inverters. Output voltage and current waveforms, Principle of operation of bridge inverter concept of voltage source, Current source and Pulse width modulated bridge inverter, Performance parameters.

POWER SUPPLIES: D. C. and A. C. power supplies, Switched mode power supplies, Resonant power supply. **(Lectures 08)**

Project work

A project work will be 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/her practical skill & knowledge.

Text Books:

1. M. H. Rashid: *Power Electronics, Circuit Devices and Applications*, PHI, 1988
2. V. Subrahmanyam: *Power Electronics*, New Age Inc. Publishers, New Delhi, 1996
3. P. C. Sen: *Power Electronics*, Tata McGraw Hill 1987

Reference Books:

1. C. W. Lander: *Power Electronics*, 2nd Ed. McGraw Hill 1987
2. P.S. Bimbhra: *Power Electronics*, 2nd Ed. Khanna Publishers, 1998
3. M.D. singh and K.B. Khanchandani: *Power Electronics*, TMH, 1998

SWITCHGEAR AND PROTECTION

Fifth Semester

	L	T	P	C
Course Code: DEE502	**3**	**2**	**-**	**4**

Course Contents

Unit I

Introduction to Protection System: Functions of protective relaying, protective zones primary and backup protection, desirable qualities of protective relaying, basic terminology. Relays: Electromagnetic, attracted and induction type relays, thermal relay, gas actuated relay.

(Lectures 08)

Unit II

Relay Application and Characteristics:

Amplitude and phase comparators, over current relays, directional relays, distance relays, differential relay.

Static Relays:

Comparison with electromagnetic relay, classification and their description, over current relays, directional relay, distance relays, differential relay. **(Lectures 08)**

Unit III

Protection of Transmission Line: Over current protection, distance protection, pilot wire protection carrier current protection, protection of bus, auto reclosing, **(Lectures 08)**

Unit IV

Circuit Breaking: Properties of arc, arc extinction theories, restriking voltage transient, current chopping resistance switching, capacitive current interruption, short line interruption, circuit breaker ratings. Testing of Circuit Breaker: Classification, testing station and equipments, testing procedure, direct and indirect testing. **(Lectures 08)**

Unit V

Apparatus Protection: Protection of transformer, Buccholz relay, generator and motor. Circuit Breaker: Operating modes selection of circuit breakers, constructional features and operation of Bulk Oil, Minimum Oil, Air Blast SF6, Vacuum and DC circuit breakers. **(Lectures 08)**

Project work

A project work will be 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/her practical skill & knowledge.

Text Books:

1. Rao S. S. "*Switchgear and Protection*",Khanna Publishers.
2. Ravindranath B. and M. Chander "*Power system Protection and Switchgear*", , iley Eastern Ltd.

Reference Books:

1. Ram B. and D. N. Vishwakarma, "*Power System Protection and Switchgear*", Tata Mc. Graw Hill
2. Paithankar Y. G. and S R Bhide, "*Fundamentals of Power System Protection*", Prentice Hall of India.
3. Rao T. S. M, "*Power System Protection: Static Relays with Microprocessor*",

POWER SYSTEM
Fifth Semester

	L	T	P	C
Course Code: DEE503	**3**	**2**	**-**	**4**

Course Contents

Unit-1

Electrical Design of Lines:

Layout of different transmission and distribution systems, advantages of high voltage transmission, concept of short, medium and long lines, parameters of lines, performance of short lines (Regulation, efficiency, vector diagrams) corona formation and its effects on performance of lines. **(Lectures 08)**

UNIT-2

Constructional Features of Transmission Lines:

Types of supports, types of conductors, types of insulators, their properties, selection and testing, voltage distribution of string insulators, equalization of potential. Vibration dampers. **(Lectures 08)**

UNIT-3

Economic Principle of Transmission:

Kelvin's law, limitations of Kelvin's law, Modification in Kelvin's law. Mechanical design of lines : Sag measurement, use of sag template Indian Electricity Rules pertaining to clearance, stringing of lines. **(Lectures 08)**

UNIT-4

Distribution System: Feeders distributors and service mains, radial and ring main distributors, A.C. distributors fed from one end and both ends. Simple problems on size of feeders and distributors. **Construction of Distribution Lines: E**rection of pole, fixing of insulators on conductors, testing, operation and maintenance of lines. **(Lectures 08)**

UNIT-5

Underground Cables: Power cable construction, comparison of overhead lines and underground cables, laying of cables, cable jointing, use of apoxy resin kits. Fault location, Murray loop test, testing of cables. **Carrier Communication:** Prinicple of carrier communication over Power Lines, purposes, equipment, differences between radio transmission and carrier communication, block diagram. **(Lectures 08)**

Project work

A project work will be 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/her practical skill & knowledge.

TEXT BOOKS;-

1. M.L. Soni, Gupta, Bhatnagar, Chakrabarthy, "*A Text book on Power Systems Engineering",* Danpat Rai & Sons, 2007.
2. Wadhwa, C.L., '*Electrical Power Systems'*, Wiley Eastern Limited India, 1985.

REFERENCE BOOKS;-

1. S.N. Singh, *'Electric Power Generation, Transmission and Distribution'*, Prentice Hall of India Pvt. Ltd, New Delhi, 2002.
2. B.R. Gupta, *"Generation of Electrical Energy",* Eurasia Publishing House (Pvt.) Ltd., Ramnagar, New Delhi, 1983

NON-CONVENTIONAL ENERGY SOURCES
Fifth Semester

	L	T	P	C
Course Code: DEE504	**3**	**2**	**-**	**4**

Course Contents

Unit I

Introduction: Importance of Non conventional sources of energy, Present Scenario, Future Prospects, Economic Criteria. **(Lectures 08)**

Unit II

Solar Energy: Principle of conversion of Solar radiation into heat, Photo-voltaic cell, Electricity generation, Application of solar energy like Solar water heaters, Solar Furnaces, Solar cookers, Solar lighting, Solar pumping. Hydro Energy: Hydro-electric Power Plants, Mini and Micro hydro-electric power generation. **(Lectures 08)**

Unit III

Bio-energy: Bio-mass Conversion Technologies- wet and dry processes. Methods for obtaining energy from biomass. Power generation by using gasifies.

Wind Energy: Wind Energy Conversion, Windmills, Electricity generation from wind- Types of wind mills, local control, energy storage. **(Lectures 08)**

Unit IV

Geo-thermal and Tidal Energy: Geo-thermal sources, Ocean thermal electric conversion, open and closed cycles, hybrid cycles. Prime movers for geo-thermal energy conversion. Steam Generation and electricity generation. **(Lectures 08)**

Unit V

Magneto Hydro Dynamic (MHD) Power Generation, Chemical Energy Sources: Design and operating principles of a fuel cell, conversion efficiency, work output and emf of fuel cells, and their applications, storage battery characteristics, types, maintenance of batteries. Thermo Electric Power: Basic principle, performance analysis of thermo electric power generation, thermoelectric materials and their application. **(Lectures 08)**

Project work

A project work will be 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/her practical skill & knowledge.

TEXT BOOKS:

1. SP Sukhatm, *Solar Energy – Principles of thermal collection and Storage*, Tata McGraw Hill Publication, New Delhi.
2. GD Rai, *Solar Energy Utilization*; Khanna Publishers, New Delhi.
3. MS. Sodha*, Reviews of Renewable Energy Sources, Vol. 3, Edited*, S.S. Mathur, MAS Malik, TC Kandpal ; Wiley Eastern Limited, New Delhi.

REFERENCE BOOKS:

1. NK Bansal*, Renewable Energy Sources and Conversion Technology*, Manfred Kleemann, Michael Meliss, Tata McGraw Hill Publishing Co. Ltd New Delhi.
2. Maheshwar Dayal, *Energy Today and Tomorrow*; Publications Division, Ministry of Information and Broadcasting, Govt. of India, New Delhi.
3. S Rao and BB Parulekar*, Energy Technology (non-conventional, renewable and conventional)*, Khanna Publishers, New Delhi
4. RK Singal*, Non-Conventional Energy Resources*, SK Kataria and Sons, New D

ENVIRONMENTAL EDUCATION
Fifth Semester

	L	T	P	C
Course Code: DEE505	**3**	**-**	**-**	**3**

Course Contents:

Unit:- I

INTRODUCTION:-

Basics of ecology, Ecosystem, Biodiversity Human activities and its effect on ecology and eco system, different development i.e. irrigation, urbanization, road development and other engineering activities and their effects on ecology and eco system, Mining and deforestation and their effects. Lowering of water level , Urbanization. Biodegradation and Biodegradability, composting, bio remediation, Microbes .Use of biopesticidies and biofungicides. Global warning concerns, Ozone layer depletion, Green house effect, Acid rain, etc. Sources of pollution, natural and manmade, their effects on living environments and related legislation. **(8 Lectures)**

Unit:- II

WATER POLLUTION:-

Factors contributing water pollution and their effect. Domestic waste water and industrial waste water. Heavy metals, microbes and leaching metal. Physical, Chemical and Biological Characteristics of waste water. Indian Standards for quality of drinking water. Indian Standards for quality of treated waste water. Treatment methods of effluent (domestic waste water and industrial/ mining waste water), its reuse/safe disposal. **(8 Lectures)**

Unit:- III

AIR POLLUTION:-

Definition of Air pollution, types of air pollutants i.e. SPM, NOX, SOX, GO, CO2, NH3, F, CL, causes and its effects on the environment. Monitoring and control of air pollutants, Control measures techniques. Introductory Idea of control equipment in industries i.e., Settling chambers, Cyclones, Scrubbers (Dry and Wet), Multi Clones, Electro Static Precipitations, Bog Fillers. Ambient air qulaity measurement and their standards., Process and domestic emission control, Vehicular Pollution and Its control with special emphasis of Euro-I, Euro-II, Euro-III and Euro IV. **(8 Lectures)**

Unit:- IV

NOISE POLLUTION:- Sources of noise pollution, its effect and control.

RADIO ACTIVE POLLUTION:- Sources and its effect on human, animal, plant and material, means to control and preventive measures. **(8 Lectures)**

Unit:- V

SOLID WASTE MANAGEMENT:- Municipal solid waste, Biomedical waste, Industrial and Hazardous waste, Plastic waste and its management.

ENVIRONMENTAL IMPACT ASSESSMENT (EIA):- Basic concepts, objective and methodology of EIA. Objectives and requirement of Environmental Management System (ISO-14000) (An Introduction). **(8 Lectures)**

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

Reference Books:-

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

Communication Technique
Fifth Semester

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

Course Content:

Unit I

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

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

Unit II

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

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

Unit III

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

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

Unit IV

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

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

Recommended Books:

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

NOTE:

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

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

POWER ELECTRONICS LAB

Fifth Semester

	L	T	P	C
Course Code: DEE551	**-**	**-**	**8**	**4**

List of Experiments

1. Study the characteristics of SCR: Observe the terminal configuration, Measure the breakdown voltage, Measure latching and holding current and V-I characteristics.
2. Study the different triggering circuits for SCR: R-triggering circuit, R-C triggering circuit and UJT triggering circuit.
3. Study the firing circuit for single-phase converters using ramp comparator scheme.
4. Study the firing circuit for single-phase converters using cosine wave comparator scheme.
5. Study the firing circuit for single-phase converters using op-amps and gates.
6. Study and obtain the characteristics of Diac.
7. Study and obtain the waveforms for single-phase half-wave controlled converter.
8. Study and obtain the waveforms for single-phase half controlled symmetrical and asymmetrical bridge converters.
9. Study and obtain the waveforms for single-phase fully controlled bridge converter
10. Study and show the effect of freewheeling diode in single-phase fully controlled bridge converter.
11. Study and obtain the waveforms for voltage commutated chopper.
12. Study and obtain the waveforms for current commutated chopper.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

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

Evaluation scheme:

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

External Evaluation (50 marks)

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

ELECTRICAL SIMULATION LAB
Fifth Semester

	L	T	P	C
Course Code: DEE552	**-**	**-**	**8**	**4**

List of Experiments (PSPICE based)

1. Study of various commands of PSPICE.
2. To determine node voltages in a resistive network.
3. To determine branch currents in a resistive network
3. To obtain Thevenin's equivalent circuit of a resistive network.
4. To obtain transient response of a series R-L-C circuit for step voltage input.
5. To obtain transient response of a parallel R-L-C circuit for step current input.
6. To obtain transient response of a series R-L-C circuit for alternating square voltage waveform.
7. To obtain frequency response of a series R-L-C circuit for sinusoidal voltage input.
8. To obtain output characteristics of CE NPN transistor.
9. To verify truth tables of NOT, AND or OR gates implemented by NAND gates by plotting their digital input and output signals.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

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

Evaluation scheme:

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

External Evaluation (50 marks)

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

Reference Books:

1. Irvine, Calif, "PSPICE Manual" Microsim Corporation, 1992.
2. Paul W. Tuinenga, "SPICE : A guide to circuit Simulation and Analysis Using PSPICE", Prentice Hall, 1992.
3. M.H. Rashid, "SPICE for Circuits and Electronics Using PSPICE" Prentice Hall of India, 2000.

INDUSTRIAL TRAINING
Semester V

Course Code: DEE 555	L	T	P	C
	-	-	-	4

Students will attend Industrial training of four to six weeks in any industry or reputed organization after the IV semester examination in summer vacation. The evaluation of this training shall be included in the V semester evaluation.

The student will be assigned a faculty guide who would be the supervisor of the student. The faculty would be identified before the end of the IV semester and shall be the nodal officer for coordination of the training.

Students will also be required to prepare an exhaustive technical report of the training during the V semester which will be duly signed by the officer under whom training was taken in the industry/ organization. The covering format shall be signed by the concerned office in-charge of the training in the industry. The officer-in-charge of the trainee would also give his rating of the student in the standard University format in a sealed envelope to the Principal of the Polytechnic.

The student at the end of the V semester will present his report about the training before a committee constituted by the Principal of the Polytechnic which would be comprised of at least three members comprising of the Department Coordinator, Class Coordinator and a nominee of the Principal. The students guide would be a special invitee to the presentation. The seminar session shall be an open house session. The internal marks would be the average of the marks given by each member of the committee separately in a sealed envelope to the Principal.

The marks by the external examiner would be based on the report submitted by the student which shall be evaluated by the external examiner and cross examination done of the student concerned.

Not more than three students would form a group for such industrial training/ project submission.

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

INSTALLATION & MAINTENANCE OF ELECTRICAL EQUIPMENTS

Sixth Semester

	L	T	P	C
Course Code: DEE601	**3**	**2**	**-**	**4**

Course Contents

Unit I

Tools and Accessories: Tools, accessories and instruments required for installation, maintenance and repair work, Knowledge of Indian Electricity rules, safety codes, causes and prevention of accidents, artificial respiration of an electrocuted person, workmen's safety devices. **(Lectures 08)**

Unit II

Installation: Installation of transmission and Distribution Lines: Erection of steel structures, connecting jumpers, tee-off points, joints and dead ends; crossing of roads, streets, power/telecommunication lines and railway line crossings, clearances; earthing of transmission lines and guarding, spacing and configuration of conductors: Arrangement for suspension and strain insulators, bird guards, anti-climbing devices and danger plates; sizes of conductor, earth wire and guy wires, Testing and Commissioning. Laying of service lines, earthing, provision of service fuses, installation of energy meters. **(Lectures 08)**

Unit III

Elementary idea regarding, inspection and handling of transformers; Pole mounted substations, plinth mounted substations, grid substation, bus bars, isolation, voltage and current transformers, lightning arrestors, control and relay panels, HT/LT circuit breakers, LT switches, installation of power/distribution transformers, dehydration. Earthing system, fencing of yard, equipment foundations and trenches. **(Lectures 08)**

Unit IV

Maintenance:- Types of maintenance, maintenance schedules, procedures, Maintenance of Transmission and Distribution System; Location of faults using Meggar, effect of open or loose neutral connections, provision of proper fuses on service lines and their effect on system, causes of dim and flickering lights. **(Lectures 08)**

Unit V

Maintenance of Distribution Transformers: Transformer maintenance and points to be attended to in respect of various items of equipment, Checking of insulation resistance, transformer oil level and BDV test of oil, measurement of earth resistance

Domestic Installation: Introduction, testing of electrical installation of a building, testing of insulation resistance to earth, testing of insulation and resistance between conductors continuity or open circuit test. **(Lectures 08)**

Project work

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

TEXT BOOKS

1. Rao S, *Testing, Commissioning, Operation and Maintenance of Electrical Equipment*, Khanna Technical Publication, New Delhi.
2. Asfaq Hussain "Basic Electrical Engineering", Dhanpat Rai

REFERENCE BOOKS

1. Sharotri SK, *Preventive Maintenance of Electrical Apparatus*, Katson Publishing House, Ludhiana

MICROPROCESSORS
Sixth Semester

	L	T	P	C
Course Code: DEE602	**3**	**2**	**-**	**4**

Objective

To study the microprocessor and its application in the electronics and electrical field

Course Contents

Unit I

Introduction to Microprocessor: 8085 Evolution of Microprocessor, Register Structure, ALU, Bus Organization, Timing and Control, instruction set. Architecture of 16-bit Microprocessors: Architecture of 8086; (Bus Interface Unit, Execution unit) Register Organization, Bus operation, Memory segmentation. **(Lectures 08)**

Unit II

Assembly Language Programming: Addressing Modes and instruction set of 8086, Arithmetic and Logic instructions, Program Control Instructions (jumps, conditional jumps, subroutine call) Loop and string instructions, Assembler Directives. **(Lectures 08)**

Unit III

CPU Module: Signal Description of pins of 8086 and 8088, Clock generator, Address and Data bus Demultiplexing, Buffering Memory Organization, Read and Write cycle Timings, Interrupt Structures, Minimum Mode, and Maximum Mode Operation. **(Lectures 08)**

Unit IV

Peripheral Interfacing: Programmed I/O, Interrupt Driven, I/O, DMA, Parallel I/O, (8255-PPI, Parallel port), 8253/8254 programmable Timer/Counter Interfacing with ADC. **(Lectures 08)**

Unit V Peripheral

Interfacing (Contd.): 8259 Programmable Interrupt controller, 8237 DMA controller Concept of Advanced 32 bit Microprocessors: Pentium Processor. **(Lectures 08)**

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. Gaonkar,Ramesh S "*Microprocessor Architecture, Programming, and Applications with the 8085*",., Pen ram International Publishing.
2. Ray, A.K. & Burchandi "*Advanced Microprocessors and Peripherals: Architecture Programming and Interfacing*", , K.M. Tata McGraw Hill.
3. Hall D.V., "*Microprocessors Interfacing*", Tata McGraw Hill.
4. " Singh B.P. & Renu Singh, "*Microprocessors and Microcontrollers*New Age International.

Reference Books:

1. Liu and Gibson G.A "*Microcomputer Systems: The 8086/8088 Family*",., Prentice Hall (India).
2. Brey, Barry B *"INTEL microprocessors*", Prentice Hall (India).
3. Ram B. "*Adavanced Microprocessor & Interfacing*", , Tata McGraw Hill.
4. Renu Singh & B.P. Singh "*Microprocessors and Interfacing & Applications*",New Age International.

UTILIZATION OF ELECTRICAL ENERGY & TRACTION
Sixth Semester

	L	T	P	C
Course Code: DEE603	**3**	**2**	**-**	**4**

Objective
To study the utilization of electrical energy in various applications

Course Contents
Unit I
Electric Heating: Advantages and methods of electric heating, Resistance heating ,Electric arc heating, Induction heating, Dielectric heating. **(Lectures 08)**

Unit II
Electric Welding: Electric Arc Welding Electric Resistance welding Electronic welding control Electrolyte Process: Principles of electro deposition, Laws of electrolysis, applications of electrolysis. **(Lectures 08)**

Unit III
Illumination: Various Definitions : flux, solid angle, luminous intensity, illumination, luminous efficiency, depreciation factor coefficient of utilization, space to height ratio, reflection factor, laws of illumination, requirements of good lighting, Design of indoor lighting and outdoor lighting systems: Calculation of number of light points for interior illumination, Different sources of light: filament lamp, mercury lamp, fluorescent lamp, sodium lamp, neon lamp. **(Lectures 08)**

Unit IV
Electrochemical Processes: Need of electro-deposition. Faraday's laws in electro- deposition. Simple numerical problems, Refrigeration and Air Conditioning: Refrigeration systems, domestic refrigerator, water cooler Types of air conditioning, Window air conditioner. **(Lectures 08)**

Unit V
Electric Traction: Types of electric traction, systems of track Electrification Traction mechanics- types of services, speed time curve and its simplification, average and schedule speeds, Tractive effort, specific energy consumption, mechanics of train movement, coefficient of adhesion and its influence. **(Lectures 08)**

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. Partab H."*Art and Science of Electrical Energy*", , Dhanpat Rai & Sons.
2. Dubey G. K. "*Fundamentals of Electric Drives*", , Narosa Publishing House

Reference Book:

1. Taylor E.O. "*Utilization of Electric Energy*",Pitman & Sons.

GENERATION OF ELECTRICAL POWER

Sixth Semester

	L	T	P	C
Course Code: DEE604	**3**	**2**	**-**	**4**

Objective: The objective behind this subject is to impart knowledge about measuring of electrical instruments.

Course Contents

Unit I

Method of bulk energy generation: Introduction to thermal, hydel, nuclear and gas power plants with their layouts. Concept of co-generation. Impact of thermal, hydro and nuclear stations on environment. (**Lectures 08)**

Unit II

Power Factor Improvement: Effect of low power factor, causes of low power factor, necessity for improvement of power factor, methods for improving power factor. Advantages of improved power factor by installing capacitors at consumer end. (**Lectures 08)**

Unit III

Load and Load curves: Types of load, chronological load curves, load duration curve, energy load curve, mass curve Maximum demand, demand factor, load factor, capacity factor, utilization factor, diversity factor.

Power plant economics: Capital cost of plants, annual fixed and operating costs of plants, generation cost and depreciation, Effect of load factor on unit energy cost, Role of load diversity in power system economics, Off peak energy utilization, Energy cost reduction. (**Lectures 08)**

Unit IV

Tariffs: Objectives of tariffs, General tariff form, Flat demand rate, straight meter rate, block meter rate, two part tariffs, power factor dependent tariffs, three parts tariff, Spot (time differentiated) pricing. (**Lectures 08)**

Unit V

Selection of Power Plant: Comparative study of thermal, hydel, nuclear and gas power plants. Base load and peak load plants, Size of generating units, types of reserve and size of plant. Selection and location of power plants. (**Lectures 08)**

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. Gupta B. R.– *Generation of Electrical Energy*
2. Gupta Soni, and Bhatnagar – *Generation of Electrical Power*

Reference Books:

1) Uppal S. L.– *Electrical Power*

2) Deshande M. V. – *Elements of Electrical Power Station Design.*

CORPORATE COMMUNICATION
Sixth Semester

Course Code: DIP 601	L	T	P	C
	2	0	2	3

Course Content:

Unit I

Corporate Behaviour: Corporate expectation, office etiquettes, Telephonic Conversation & etiquette. **(8 hours)**

Practical (oral): To make the students aware of Corporate life & culture & also to teach them about telephone courtesy etc. **(2 hours)**

Unit II

Communication: Press Communication, Press note, e-mail, Inviting tenders, Writing advertisements, Writing notices. **(8 hours)**

Practical (oral): To make students develop the understanding of media importance. **(2 hours)**

Unit III

Interview Skills: Concept & Process, Preparing for the Interview, Types of Interview. **(8 hours)**

Practical (oral): Mock Interview Practice. **(2 hours)**

Unit IV

Modern Technology & Communication: Globalization impact, Role of Information Technology, Tele-Communication, Internet, Tele- Conferencing and Video-Conferencing. **(8 hours)**

Practical (oral): To make students speak on I.T./Internet/Tele & Video Conferencing. **(2 hours)**

Recommended Books:

1. Chhabra T.N. – Business Communication Sun India Pub. N.Delhi.
2. Raman Meenakshi & Sharma Sangeeta – Technical Communication – Principles & Practices, - ONP, N. Delhi.

NOTE:

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

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

INSTALLATION & MAINTENANCE OF ELECTRICAL EQUIPMENTS LAB

Sixth Semester

	L	T	P	C
Course Code: DEE651	**-**	**-**	**4**	**2**

LIST OF EXPERIMENTS:

1. Setting handling of tools and accessories for installing heavy equipment.
2. Commissioning of electrical equipment.
3. Measurement of earth resistance.
4. Testing of transformer oil.
5. Fault finding and repairing of different types of electrical wiring.
6. Disassembling and assembling of electrical machines e.g. electric iron, washing machines, Geyser, submersible pumps, coolers etc.
7. Trouble shooting and repairing of different types of domestic and industrial electrical equipment.
8. Winding of small AC motor/transformers/chokes.
9. Cable jointing using epoxy resin kits.
10. Repair and maintenance of circuit breakers up to 11 kv.
11. Trouble shooting and repair of direct on line and star delta starter.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

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

Evaluation scheme:

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

External Evaluation (50 marks)

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

MICROPROCESSORS LAB
Sixth Semester

	L	T	P	C
Course Code: DEE652	**-**	**-**	**4**	**2**

LIST OF PRACTICAL'S

1. Assembly language programming: - Programming of simple problems.
2. Simple programming problems using 8085, 8086 microprocessor.
Trainer kit to gain competence in the use of
(a) 8085 Instruction set.
(b) Support chips or 8085.
(c) Interfacing ADC/DAC chips IS 8085.
(d) Interfacing of Display Devices (Seven Segments).
(e) Measurement of physical quantities like temperature, strain.
(f) Speed control of stepper motors.
(g) Programming of 8051 controller.

Evaluation of Practical Examination:

Internal Evaluation (50 marks)

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

Evaluation scheme:

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

External Evaluation (50 marks)

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

MAJOR PROJECT
Sixth Semester

	L	T	P	C
Course Code: DEE653	**-**	**-**	**8**	**4**

1) Students based on their subject of choice should devote themselves to make a project which preferably should be a working model of their thoughts.
2) The student will be assigned a faculty guide who would be the supervisor of the student. The faculty would be identified before the end of the VI semester.
3) The project shall be finalized by the students before the start of the VII semester and shall be completed and submitted at least one month before the last teaching day of the VIII semester, date of which shall be notified in the academic calendar.
4) The assessment of performance of students should be made at least twice in each semester i.e. VII and VIII and each internal assessment shall be for 100 marks. The student shall present the final project live as also using overheads project or power point presentation on LCD to the internal committee as also the external examiner.
5) The evaluation committee shall consist of faculty members constituted by the college which would comprise of at-least three members comprising of the Department Coordinator, Class Coordinator and a nominee of the Principal. The students guide would be a special invitee to the presentation. The seminar session shall be an open house session. The internal marks would be the average of the marks given by each member of the committee separately to the Principal in a sealed envelope.
6) Not more than three students would form a group for such industrial training/ project submission.
7) The marking shall be as follows.

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

Evaluation scheme:

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

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