Study & Evaluation Scheme

of

Diploma in Electronics Engineering
Lateral Entry
[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 (Electronics- Lateral)

SUMMARY

Programme : Diploma in Engineering Lateral Entry
Duration : 2 Years (Semester system)
Medium : English

Minimum Required Attendance : 75 %

Assessment (Theory and Project) :

Internal	External	Total
30+10 (Project)	60	100

Maximum Credit : **131**

Minimum Credit required for the degree : **127**

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 (Electronics)
Semester- III

S. No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	DIP301	Applied Mathematics	4	-	-	4	40	60	100
2	DIP302	Basic Electrical & Electronics Engineering	4	-	-	4	40	60	100
3	DIP303	Applied Mechanics	4	-	-	4	40	60	100
4	DIP304	Concepts in Information Technology	4	-	-	4	40	60	100
5	DIP305 OR DIP306 OR DEE304	Building Material OR Basics of Mechanical Engineering OR Electrical & Electronics Engineering Materials	3	2	-	4	40	60	100
6	DIP307	Foundation English	2	-	2	3	40	60	100
7	DIP351	Electrical & Electronics Engineering Lab	-	-	4	2	50	50	100
8	DIP352	Information Technology Lab	-	-	4	2	50	50	100
9	DIP353	Engineering Drawing	2	-	6	5	50	50	100
10	DIP354	Workshop Practice	-	-	8	4	50	50	100
11	DGP301	Discipline & General Proficiency	-	-	-	1	100	-	100
Total			**23**	**2**	**24**	**37**	**540**	**560**	**1100**

Semester- IV

S. No.	Course Code	Subject	Periods			Credit	Evaluation Scheme		
			L	T	P		Internal	External	Total
1	DEC471	Network Filters & Transmission Lines	4	-	-	4	40	60	100
2	DEC472	Programming in C & C^{++}	4	-	-	4	40	60	100
3	DEC473	Electronic Instruments & Measurement	4	-	-	4	40	60	100
4	DEC474	Communication Systems	4	-	-	4	40	60	100
5	DEC475	Digital Electronics and Analog Communication	4	-	-	4	40	60	100
6	DEC476	Electronics Devices and Electrical Machines	4	-	-	4	40	60	100
7	DIP402	English Communication	2	-	2	3	40	60	100
8	DEC461	Network Filters & Transmission Lines Lab	-	-	2	1	50	50	100
9	DEC462	Programming in C & C^{++} Lab	-	-	2	1	50	50	100
10	DEC463	Electronic Instruments & Measurement Lab	-	-	2	1	50	50	100

11	DEC464	Communication Systems Lab	-	-	2	1	50	50	100
12	DEC465	Digital Electronics and Analog Communication Lab	-	-	2	1	50	50	100
13	DEC466	Electronics Devices and Electrical Machines Lab	-	-	2	1	50	50	100
14	DGP401	Discipline & General Proficiency	-	-	-	1	100	-	100
Total			**26**	**-**	**14**	**34**	**680**	**720**	**1400**

Semester- V

S. No.	***Course Code***	***Subject***	***Periods***			***Credit***	***Evaluation Scheme***		
			L	***T***	***P***		***Internal***	***External***	***Total***
1	DEC501	Audio Video System	3	2	-	4	40	60	100
2	DEC502	Optical Fiber & Communication	3	2	-	4	40	60	100
3	DEC503	Industrial Electronics & Transducers	3	2	-	4	40	60	100
4	DEC504	Circuits & Network	3	2	-	4	40	60	100
5	DIP501	Communication Technique	2	-	2	3	40	60	100
6	DEC551	Audio Video System Lab	-	-	4	2	50	50	100
7	DEC552	Mini Project (Electronics Circuit Design Lab)	-	-	4	2	50	50	100
8	DEC553	Industrial Electronics & Transducers Lab	-	-	4	2	50	50	100
9	DEC554	Circuits & Network Lab	-	-	4	2	50	50	100
10	DEC555	Industrial training	-	-	-	4	50	50	100
11	DGP501	Discipline & General Proficiency	-	-	-	1	100	-	100
Total			**14**	**8**	**18**	**32**	**550**	**550**	**1100**

Semester- VI

S. No.	***Course Code***	***Subject***	***Periods***			***Credit***	***Evaluation Scheme***		
			L	***T***	***P***		***Internal***	***External***	***Total***
1	DEC601	Digital System Design	3	2	-	4	40	60	100
2	DEC602	Industrial Economics & Principles of Management	3	2	-	4	40	60	100
3	DEC603	Microprocessors & Application	3	2	-	4	40	60	100
4	DEC604	Control System	3	2	-	4	40	60	100
5	DIP601	Corporate Communication	2	-	2	3	40	60	100
6	DEC651	Major Project Lab	-	-	8	4	50	50	100
7	DEC653	Microprocessors & Application Lab	-	-	4	2	50	50	100
8	DEC654	Control System Lab	-	-	4	2	50	50	100
9	DGP601	Discipline & General Proficiency	-	-	-	1	100	-	100
Total			**14**	**8**	**18**	**28**	**450**	**450**	**900**

APPLIED MATHEMATICS
Third Semester

	L	T	P	C
Course Code: DIP301	**4**	**-**	**-**	**4**

Course Contents:

Unit I

ALGEBRA-I:

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

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. **(8 Lectures)**

Unit II

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 DeMoivre's theorem, its application in solving algebraic equations, Modulus Function and its properties.

(8 Lectures)

Unit III

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. **(8 Lectures)**

Unit IV

DIFFERENTIAL CALCULUS – I :

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

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

Application - Finding Tangents, Normal, Points of Maxima/Minima. **(8 Lectures)**

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Unit V

INTEGRAL CALCULUS – I :

Methods of Indefinite Integration: Integration by substitution, Partial fraction and by parts.

Meaning and properties of definite integrals, Evaluation of definite integrals.

Simpson's and Trapezoidal Rule: their application in simple cases. **(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. 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. Mittal S C & Mittal, S K., *Three Dimensional Coordinate,* Pragati Prakashan, Meerut
4. Loney, S L, *Trigonometry (I part)*
5. Goel, B S, *Algebra*

BASIC OF ELECTRICAL AND ELECTRONICS ENGINEERING

BASIC OF ELECTRICAL ENGINEERING
Third Semester

	L	T	P	C
Course Code: DIP302	**4**	**-**	**-**	**4**

Course Contents:

Unit 1

BASIC 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 2

DC CIRCUIT: Ohms Law, Resistance in series and Parallel, Voltage and current division rule, Kirchhoff's Laws and their application in solving simply 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 3

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)

BASIC ELECTRONICS ENGINEERING

Unit 4

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 5

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 type of diode, power diode, zener diodes, varactor diodes, tunnel diode, LED's and photo diodes. **(8 Lectures)**

Unit 6

Introduction to Bipolar Transistor Biasing and Stabilization of Operating Point:- Concept of bipolar transistor as a two junction three terminal device having two kinds of charge carriers, PNP and NPN transistors, their symbols, concept of leakage current, effect of temperature on leakage 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)**

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.
3. Therja B.L.*, Fundamental of Electrical Engineering*, S.Chand & Co., Delhi.

APPLIED MECHANICS
Third Semester

	L	T	P	C
Course Code: DIP303	**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 : 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. Concept of 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 of 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

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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

Third Semester

	L	T	P	C
Course Code: DIP304	**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

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

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

Unit III

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

Unit IV

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

Unit V

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

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

(Lectures 08)

Project work

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Text Books

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

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.

BUILDING MATERIAL
Third Semester

	L	T	P	C
Course Code: DIP305	**3**	**2**	**-**	**4**

Course Contents:

Unit 1

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

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

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

Availability, Characteristics and uses of the following stone:- Granite, Sand stone, Lime stone, Slate, basalt, trap quartzite and marble, Availability of different stones in the state.

(8 Lectures)

Unit 2

Bricks & clay Products- Raw material for manufacture, Properties of good brick making earth, field-testing of brick clay. Manufacture of bricks, Preparation of clay-Manually/Mechanically. Molding: hand molding and machine molding, drying of bricks, Burning of bricks, Types of Kilns, Bull's Trench Kiln and Hoffman's kiln, Process of burning, Size of standard Bricks, its classification of brick as per I.S. and testing of common building bricks as compressive strength, water absorption, effloresce test. **(8 Lectures)**

Unit 3

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

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

Unit 4

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

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

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

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

Unit 5

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

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

Project work

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

Text Books:-

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

Reference Books:-

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

BASICS OF MECHANICAL ENGINEERING
Third Semester

	L	T	P	C
Course Code: DIP306	**3**	**2**	**-**	**4**

Course Contents:

Unit- I

Fluid Mechanics:- Introduction: Definition of fluid, Real fluid, fluid properties, fluid pressure and its measurement. Atmosphere, Absolute, Gauge and vacuum pressure. Buoyancy and flotation, Meta centre and Meta centric height, Suitability of submerged and floating bodies.

(8 Lectures)

Unit- II

Fluid flow, types of fluid flow, velocity and accelerations 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- III

Thermodynamic:- Basic concept and definitions. Macroscopic and microscopic approach. Thermodynamics systems, boundary, surrounding and universe, properties states, path process, cycle, qua-sistatic process, Reversible and Irreversible process. **(8 Lectures)**

Unit- IV

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- V

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 chains, 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. The project will be evaluated by the external examiner.

Text Books

1. Garg R.P., *Elements of Mechanical Engineering*, Standard Publishers Distributors, Delhi.

ELECTRICAL AND ELECTRONICS ENGINEERING MATERIALS

Third Semester

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

Course Contents

Unit- 1

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, constantan nichrome, 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, alnico, 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, leads 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

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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.

FOUNDATION ENGLISH

Third Semester

Course Code: DIP307

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.**

ELECTRICAL AND ELECTRONICS ENGINEERING LAB
ELECTRICAL ENGINEERING LAB
Third Semester

	L	T	P	C
Course Code: DIP351	**-**	**-**	**4**	**2**

PRACTICALS:

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

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

External Evaluation (50 marks)

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

BASIC ELECTRONIC (LAB)

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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</table>

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
Third Semester

	L	T	P	C
Course Code: DIP352	**-**	**-**	**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. Implement 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.

ENGINEERING DRAWING

Third Semester

	L	T	P	C
Course Code: DIP353	**2**	**-**	**6**	**5**

Course Contents:

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.
Printing of vertical and inclined normal single stroke 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 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 Geometrical Solids **2 Sheet**

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.

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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
Third Semester

	L	T	P	C
Course Code: DIP354	**-**	**-**	**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 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.

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 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.

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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.

DISCIPLINE & GENERAL PROFICIENCY

Course Code: DGP301/401/501/601

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).

NETWORK FILTERS AND TRANSMISSION LINES

Fourth Semester

	L	T	P	C
Course Code: DEC471 (Common with DEC401)	**4**	**-**	**-**	**4**

Course Contents

Unit I

Networks: Two port (four terminals) network, Symmetrical and asymmetrical networks: Balanced and unbalanced network; T-network, Л network, Ladder network; Lattice network; L-network and Bridge T-network ,Symmetrical Network:, Asymmetrical Network, Concept and significance of iterative impedance, image impedance, image transfer constant and insertion loss. The half section (L-section); symmetrical T and Л sections into half sections. **(Lectures 08)**

Unit II

Attenuators- Units of attenuation (Decibels and Napers): General characteristics of attenuators. Analysis and design of simple attenuator of following types; Symmetrical T and Л type, L type. **(Lectures 08)**

Unit III

Filters: - Brief idea of the use of filter networks in different communication systems, concept of low pass, high pass, band pass and band stop filters. Basic ideas of Butterworth, Chebychev filters.

Prototype Filter Section, Impedance characteristics vs frequency characteristics of a low and high pass filter and their significance, Attenuation Vs frequency; Phase shift Vs frequency, characteristics impedance vs frequency of T and Л filters and their significance, Simple design problems of prototype low pass section. M-Derived Filter Sections Limitation of prototype filters, need of m-derived filters

Active Filters, Basic concept of active filters and their comparison with passive filters. **(Lectures 08)**

Unit IV

Transmission Lines: Transmission Lines, their types and applications. Distributed constants, T and Л representation of transmission line section. Definition of characteristic impedance, propagation constant, attenuation constant and phase shift constant. Concept of infinite line, Condition for minimum distortion and minimum attenuation of signal on-the-line and introduction to loading methods. Concept of reflection and standing waves. **(Lectures 08)**

Unit V

Definition of reflection coefficient, SWR & VSWR and their relation (no derivation).Transmission line equation, expression for voltage, current and impedance at a point on the line, Concept of transmission lines at high frequencies. Introduction to stubs. (Single, open and short stubs). **(Lectures 08)**

Project work

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

Text Books

1. Van Valkenbury, *Network Analysis,* Prentice Hall of India, New Delhi.

2. AK Chakarvorty, *Network Filters and Transmission Lines*, Dhanpat Rai & Co. Publication, New Delhi.

Reference Books

1. John D Ryder*, Network Lines and Fields,* Prentice Hall of India, New Delhi.

2. Soni and Gupta*, Network Analysis*, Dhanpat Rai & Co. Publication, New Delhi.

PROGRAMMING IN C & C++
Fourth Semester

	L	T	P	C
Course Code: DEC472 (Common with DEC402)	**4**	**-**	**-**	**4**

Course Contents:

Unit I

CONCEPT OF PROGRAMMING:- Concept of Flowcharting, algorithm, programming, Structured Programming Various techniques of programming, Use of programming. **(8 Lectures)**

Unit II

Programming in C:- Data Types, Operators and Expressions; Input & Output print, scan, library Control Statement: IF- ELSE, While, For, Do- While, Switch; Functions and modular programming; Scope of variables, parameter passing, recursion, block structure; preprocessor statements; pointers and arrays; structures and unions; File handling. **(8 Lectures)**

Unit III

CLASSES & OBJECT:- What is a class, what is an object, constructors, types of object(external, automatic static, Dynamic objects) Met class, role of meta class. Scope of classes, array of objects, objects as a function argument. **(8 Lectures)**

Unit IV

Programming in C++:- What is object-orientation, area of object technology, C++, getting to grips with C++(data types, escape sequence, characters, variables, operator, notation, Arrays, Function conditional statements. call by value ,call by reference. **(8 Lectures)**

Unit V

Pointer:- C++ memory map, dynamic allocation pointers, pointers with arrays. Structure, structure with arrays, passing, structure of function. Enumerated data types, Inheritance, polymorphism & Overloading. **(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. The project will be evaluated by the external examiner.

Text Books:

1. Das V. Vinu, *Principles of data structures using C & C++*, New Age International Publishers, Delhi.
2. Jayasri J., *'C' Language Trainer with C Graphics & C++*, New Age International Publishers, Delhi.

Reference Books:

1. Upadhyay Nitin, *Data Structures using C*, S.K. Kataria & Sons, Delhi.
2. Lalit Arora, *Object Oriented Systems with C++*, S.K. Kataria & Sons, Delhi.

ELECTRONIC INSTRUMENTS AND MEASUREMENT
Fourth Semester

	L	T	P	C
Course Code: DEC473 (Common with DEC403)	**4**	**-**	**-**	**4**

Course Contents

Unit I

Basics of Measurements :Measurement, method of measurement, types of instruments Specifications of instruments: Accuracy, precision, sensitivity, resolution, range, errors in measurement, sources of errors, limiting errors, loading effect, importance and applications of standards and calibration. **(Lectures 08)**

Unit II

Voltage, Current and Resistance Measurement Principles of measurement of dc voltage, dc current, ac voltage, ac current, Principles of operation and construction of permanent magnet moving coil (PMMC) instruments Moving iron type instruments, milli-volt measurement Block diagram of multimeter and measurement of voltage, current and resistance using multimeter Specifications of multimeter and their applications Limitations with regard to frequency and input impedance. **(Lectures 08)**

Unit III

Cathode Ray Oscilloscope: Construction and working of Cathod Ray Tube(CRT)Time base operation and need for blanking during flyback, synchronization Block diagram description of a basic CRO and triggered sweep oscilloscope, front panel controls Specifications of CRO and their explanation Measurement of current, voltage, frequency, time period and phase using CRO CRO probes, special features of dual beam, dual trace, delay sweep block diagram and working principle. **(Lectures 08)**

Unit IV

Impedance Bridges and Q Meters Wheat stone bridge AC bridges: Maxwell's induction bridge, Hay's bridge, De-Sautee's bridge, Schering bridge and Anderson bridge Block diagram description of laboratory type RLC bridge, specifications of RLC bridge, Block diagram and working principle of Q meter. **(Lectures 08)**

Unit V

Digital Instruments Comparison of analog and digital instruments Working principle of ramp, dual slope and integration type digital voltmeter Block diagram and working of a digital multimeter Measurement of time interval, time period and frequency using universal counter/frequency counter **(Lectures 08)**

Project work

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

Text Books:

1. AK Sawhney, *Electronics Measurement and Instrumentation*, Dhanpat Rai and Sons, New Delhi

2. Cooper, *Electronics Instrumentation*, Prentice Hall of India, New Delhi

Reference Books:

1. Rajiv Sapra, *Electronics Test and Instrumentation*, Ishan Publications, Ambala.
2. Gupta JB, *Electronics Instrumentation*, Satya Prakashan, New Delhi

COMMUNICATION SYSTEMS
Fourth Semester

	L	T	P	C
Course Code: DEC474 (Common with **DEC404)**	**4**	**-**	**-**	**4**

Course Contents:

Unit I

INTRODUCTION TO COMMUNICATION SYSTEM:- Basic idea of telegraphy, telephonic, digital, microwave, fiber optics, satellite, mobile and data communication.

TELEGRAPHY:- Telegraphic code (Morse and 7.5 unit), Instruments (Key, Sounder, relay), Telegraph system (types of circuits), Equipment (Teleprinter, Telex), Voice Frequency Telegraphy . (Only brief idea, No detail required).

TELEPHONY:- A Telephone component- Construction and working of transmitter and receiver components, parts, circuit and working of subscriber's push button telephone sets.

(8 Lectures)

Unit II

CARRIER TELEPHONY:- Features of carrier telephone system; conception of frequency division multiplexing; hybrid coils; frequency allocation and formation of groups; schematic diagram and working of 3 channel and 12 channel carrier systems. Carrier and pilot frequency generation. **(8 Lectures)**

Unit III

DIGITAL COMMUNICATION SYSTEM:- Pulse code modulation- Sampling, Quantization, Encoding, Decoding, PCM Transmission formats and systems, Basic of digital multiplexing. Brief idea of multiplexing hierarchy. FSK, PSK, QAM, Demodulation, Error control (Detection and correction

MICROWAVE COMMUNICATION: - Basic features of microwave communication, Block diagram and explanation of microwave system. **(8 Lectures)**

Unit IV

SATELLITE COMMUNICATION:- Brief idea of RF uplink and down link, Multiplexing and modulation, Block diagram and brief explanation of satellite communication system.

(8 Lectures)

Unit V

MOBILE COMMUNICATION:- Radio pager, Cellular telephony system - Brief history cellular structure and planning, Frequency allocation, Propagation problem. Types of mobile system- Analog and Digital cellular radio. Architecture of GSM network, GSM services.

(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. The project will be evaluated by the external examiner.

Text Books

1. Roody, Dennis and Coolen, *John- Electronic Communications*- 4th Edition-PHI
2. Kennedy, George and Davis, *Bernard- Electronic Communication System*- 4th Edition-Tata Mcgraw Hill.

Reference Books

1. Haykin, *Simon - Communication System* - 4th Edition- John Wiley.

2. Tanenbaum, *Andrew S. - Computer Network*- 3rd Edition-PHI

DIGITAL ELECTRONICS & ANALOG COMMUNICATION

Fourth Semester

	L	T	P	C
Course Code: DEC475	**4**	**-**	**-**	**4**

Course Contents:

Unit I

Number System: Decimal, Binary, Octal, and Hexadecimal systems; Binary Arithmetic, BCD and Gray code. Boolean algebra and the 'Demerger's Theorems.

Logic Gates: BUFFER, NOT, AND, OR, NAND, NAND, NOR, X-OR, and X_NOR gates **(Lectures 08)**

Unit II

Adder & Subtract or circuits: Half adder, full adder, half subtract or, full subtractor

Flip-Flops: RS flip-flop, J-K, D-, T-flip-flops; Racing problem and the Master-Slave J-K flip-flop.

Sequential Logic Circuits: Design of asynchronous and synchronous up/down counters, Shift Registers: SIPO, SISO, PIPO, and PISO register **(Lectures 08)**

Unit III

Modulation:- Need for modulation, Basic scheme of a modern communication system. Amplitude modulation Derivation of expression for an amplitude modulated wave. Carrier and side band components. Modulation index., Relative power distribution in carrier and side bands. Elementary idea of DSB-SC, SSB-SC, ISB and VSB modulations, their comparison, and areas of applications.

Frequency modulation: Expression for frequency modulated wave and its frequency spectrum, Modulation index, maximum frequency deviation and deviation ratio, BW and FM signals, Carson's rule. Need for pre-emphasis and de-emphasis, capture effect. Comparison of FM and AM in communication systems, Phase modulation Derivation of expression for phase modulated wave, modulation index, comparison with frequency modulation. **(Lectures 08)**

Unit IV

Concept of Modulators, Square Law Modulator, Switching Modulator, Collector modulator, Base Modulator, Balanced Modulator, Ring Modulator, Principles of FM Modulators, Reactance modulator, varactor diode modulator, Armstrong phase modulator. Foster-Seeley discriminator Ratio detector, Phase locked Loop (PLL) FM demodulators. **(Lectures 08)**

Unit V

Pulse Modulation: sampling theorem and elementary idea of sampling frequency for pulse modulation, time division multiplexing (TDM) and frequency division multiplexing (FDM), PAM, PPM, PWM , Pulse code Modulation (PCM) Basic scheme of PCM system. Quantization. **(Lectures 08)**

Project work

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

Text books:

1. Malvino & Leach "*Digital Principles and Applications*", Tata McGraw Hill
2. Signov & Donovan "*Digital Electronics*", Delmar Thomson Learning.
3. Gayakwad R.A. "*Op-Amps and Linear Integrated Circuits*", , Prentice Hall of India,
4. Kennedy, *Electronics Communication*, Tata McGraw Hill, New Delhi
5. Lthi B.P., *Modern Analog & Digital Communication Systems*, Oxford University Press

Reference Books:

1. Taub & Schilling *"Digital Electronics*", Tata McGraw Hill
2. Nagrath IJ. "*Electronics Analog and Digital*", Prentice Hall of India Ltd.
3. Jain R.P. "*Modern Digital Electronics*", Tata McGraw Hill.
4. Ronald J.Tocci &. Neal S. Widmer "*Digital Systems",* Pearson Education.
5. Singh R.P. & S.D. Sapre, *Communication Systems Analog and Digital,* Tata McGraw Hill
6. Taub & Schilling*, Communication System: Analog and Digital,* Tata Mc Graw Hill

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ELECTRONIC DEVICES AND ELECTRICAL MACHINES
Fourth Semester

	L	T	P	C
Course Code: DEC476	**4**	**-**	**-**	**4**

Course Contents

Unit I

Field Effect Transistor and Regulated power supply:

Structure, operation, and characteristics, IGFET, MOSFET **,** Simple zener voltage regulator, transistorized series and shunt regulators; IC`s like: 78XX and, 79XX series, Introduction of 'SMPS' and UPS. **(Lectures 08)**

Unit II

Amplifier, Oscillator and multivibrators:

Working of RC- and Transformer coupled amplifier; Advantages of negative feedback amplifier design & applications, Power amplifiers, Design of RC and LC oscillators. Multivibrators, Sweep generators. **(Lectures 08)**

Unit III

A.C. THEORY: Representation of sinusoidal quantities by phasors. Physical explanation of the phase relationship between voltage and current when sinusoidal alternating voltage is applied across:- **(a)** Pure resistance, **(b)** Pure inductance and, **(c)** Pure capacitance.

Explanation of inductive reactance, capacitive reactance and their significance. Relationship between voltage and current when alternating voltage is applied to :- **(a)** Resistance and inductance in series, **(b)** Resistance and capacitance in series.

Solution and pharos diagrams for simple R-L-C circuits (Series and parallel); Impedance, Impedance triangle, phase angle.

Power in pure resistance, inductance and capacitance; power in combination of R L-C circuits; power factor., Active and reactive currents and their significance; practical importance of power factor. Series and parallel resonance in R-L-C circuits, Q-factor of coils and capacitance.

(Lectures 08)

Unit IV

THREE PHASE SUPPLY:-

Elementary idea about 3-phase supply., Star and delta connection. Relationship between phase and line voltage and currents. Power and power factor in three phase system and their measurement. Comparison between three phase and single phase supply. **(Lectures 08)**

Unit V

TRANSFORMERS & DC MACHINES:-

Principle of operation. E.M.F equation, Voltage & Current relations. Construction and applications of small transformers used in electronics and communication engineering, construction of auto transformers, constant voltage transformer. Phasor diagram of a transformer on load; Definition of regulation and efficiency; Elementary idea of losses in transformer, open circuit and short circuit test. Working principal and EMF equation of generator, working principal and EMF equation of DC Motor. **(Lectures 08)**

Project work

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

subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge. The project will be evaluated by the external examiner.

Text Books:

2. Millman J., C.C.Halkias, and Satyabratha Jit "*Electronic Devices and Circuits*", Tata McGraw Hill, 2007.
3. Boylestad R.L. and Louis Nashelsky, Pearson "*Electronic Devices and Circuits*", , Prentice Hall, 2006.
4. Asfaq Hussain "Basic Electrical Engineering", Dhanpat Rai
5. Nagrath I.J., *Basic Electrical Engineering*, Tata McGraw Hill

Reference Books:

1. Bogart T.F. Jr., J.S.Beasley and G.Rico, Pearson Education "*Electronic Devices and Circuits",* , 2004.
2. Burns S.G. and P.R.Bond "*Principles of Electronic Circuits*", , Galgotia Publications, 1998.
3. Millman and Grabel "*Microelectronics*, Tata McGraw Hill, 1988.
4. Dr. K. Lal Kishore "*Electronic Devices and Circuits*", , B.S. Publications, 2005.
5. Prof GS N Raju "*Electronic Devices and Circuits* I K International Publishing House Pvt. Ltd.
6. A.E. Fitgerald, D.E., Higginbotham and A Grabel, *Basic Electrical Engineering*, McGraw Hill.
7. H. Cotton, *Advanced Electrical Technology*, Wheeler Publishing

ENGLISH COMMUNICATION
Fourth Semester

Course Code: DIP402	L	T	P	C
	2	-	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.**

NETWORK FILTERS AND TRANSMISSION LINES LAB
Fourth Semester

	L	T	P	C
Course Code: DEC461 (Common with DEC451)	-	-	2	1

LIST OF PRACTICALS

1. To measure the characteristic impedance of symmetrical T and Л networks
2. To measure the image impedance of a given asymmetrical T and Л networks
3. For a prototype low pass filter:
   a) Determine the characteristic impedance experimentally
   b) Plot the attenuation characteristic
4. To design and measure the attenuation of a symmetrical T/ Л type attenuator
5. For a prototype high pass filter:
   a) Determine the characteristic impedance experimentally
   b) To plot the attenuation characteristic
6. **a)** To plot the Impedance characteristic of a prototype band-pass filter
   b) To plot the attenuation characteristic of a prototype band pass filter
7. **a)** To plot the impedance characteristic of m- derived low pass filter
   b) To plot the attenuation characteristics of m-derived high pass filter
8. To observe the information of standing waves on a transmission line and measurement of SWR and characteristic impedance of the line
9. Draw the attenuation characteristics of a crystal filter

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.

PROGRAMMING IN C & C++
Fourth Semester

	L	T	P	C
Course Code: DEC462 (Common with **DEC452)**	**-**	**-**	**2**	**1**

List of Experiments:-

1. Exercises involving output and input format controls in Pascal.

2. Exercises involving control transfer statements in C & C++

3. Exercises with arrays & Pointers in C & C++.

4. Exercises with functions in C & C++.

5. Exercises with files in C & C++.

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.

ELECTRONIC INSTRUMENTS & MEASUREMENT LAB
Fourth Semester

	L	T	P	C
Course Code: DEC463 (Common with **DEC453)**	**-**	**-**	**2**	**1**

LIST OF PRACTICALS

1. To observe the loading effect of a multimeter while measuring voltage across a low resistance and high resistance
2. To observe the limitations of a multimeter for measuring high frequency voltage
3. Measurement of voltage, frequency, time period and phase using CRO
4. Measurement of rise time and fall time using CRO
5. Measurement of Q of a coil and its dependence on frequency
6. Measurement of voltage, frequency, time and phase using DSO
7. Measurement of resistance and inductance of coil using RLC Bridge
8. Measurement of distortion of RF signal generator using distortion factor meter
9. Use of logic pulser and logic probe
10. Measurement of time period, frequency, average period using universal counter/ frequency counter

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.

COMMUNICATION SYSTEMS LAB
Fourth Semester

	L	T	P	C
Course Code: DEC464 (Common with **DEC454)**	**-**	**-**	**2**	**1**

List Of Practical's

1. Study of FAX machines and its working.
2. To study the parts of telephone hand set :
- **(a)** Frequency response of telephone receiver.
- **(b)** To observe the wave form of impulses by dialing a number.

3. Visit and study of Digital Switching System.
4. Visit and study of Microwave transmission system.
5. Visit and study of Satellite transmission system.
6. Demonstration of sampling, FSk and PSK by simple experiment.
7. Study of working of mobile phones and its services.

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.

DIGITAL ELECTRONICS & ANALOG COMMUNICATION LAB
Fourth Semester

	L	T	P	C
Course Code: DEC465	**-**	**-**	**2**	**1**

1. To verify truth tables of various basic and universal logic functions.
2. To design and verify the truth table of Half Adder and Full Adder
3. To design and verify the truth table of Half Subtractor and Full Subtractor.
4. To study various types of flip-flop
5. To study various types of counters
6. To observe an AM wave on CRO produced by a standard signal generator using internal and external modulation
7. To verify the sampling theorem
8. To observe and note the pulse modulated signals (PAM, PPM, PWM) and compare them with the corresponding analog input signal
9. To study the process of delta modulation/demodulation

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.

ELECTRONIC DEVICES & ELECTRICAL MACHINES LAB
Fourth Semester

	L	T	P	C
Course Code: DEC466	**-**	**-**	**2**	**1**

1. Design of unregulated power supply using half wave rectifier
2. Design of unregulated power supply using Full wave rectifier
3. Study and design a D.C amplifier
4. Study and design an A.C amplifier
5. Study and design a two stage amplifier
6. To verify that in an A.C. circuit, the phasor sum (not the algebraic sum) of currents at any junction is zero.
7. To find the voltage-current relationship in a R-L series circuit and to measure power and power factor of the circuit.
8. To find for a filament lamp :-
(a) Variation of resistance with temperature.
(b) Variation of temperature with voltage.
(c) Variation of resistance with voltage.
(d) Variation of power with voltage.
9. To measure power and power factor in three phase system by two wattmeter method.
10. To determine the efficiency and regulation of a transformer by performing direct loading.

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

Evaluation scheme:

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

AUDIO AND VIDEO SYSTEM
Fifth Semester

	L	T	P	C
Course Code: DEC 501	**3**	**2**	**-**	**4**

Course Contents:

Unit I

Audio System

ELECTRO ACOUSTIC TRANSDUCERS:- Microphones-carbon, condenser, moving coil, crystal, ribbon and lavaliere microphones, their construction and basic working principles, frequency response, impedance, sensitivity and directional patterns, typical applications of different types of microphones. Idea of other commercial microphones. Loudspeakers-direct radiating and horn loader type their construction, working principles characteristics and applications. Baffles and Enclosures. Introduction to tweeters and woofers and crossover networks, Speakers column. **(8 Lectures)**

Unit II

SOUND RECORDING:-

Magnetic Recording:- Principles of sound recording on Disc. Brief idea of microgrooves, playback needles, ceramic and magnetic cartridges.

Principles of sound recording on magnetic tape, Need for AC biasing, Consideration of tape speed, Tape and coating materials, Constructional features of heads, Need for reemphasis and Equalization. Definitions of WOW and Flutter.

Block diagram of tape recorder and explanation of a typical tape transport mechanism.

Optical Recording of Sound:- Basic ideas of optical recording of sound on films.

Digital Recording of Sound:- Basic ideas of Digital Recording and Reproduction of Sound. Basic concepts of sampling quantization and encoding. formats of digital audio recording, basic of recording-Servo system. Material and formation of CD, Black diagram of audio CD player. Description of its main component. **(8 Lectures)**

Unit III

HI-FI STEREO AND ITS SYSTEM:- Concept of Fidelity, noise and different types of distortions in an audio system. Stereophony, comparison of monophonic and stereophonic sound. Brief description of stereophonic recording on tape and disc. Block diagram of hi-fi stereo system, Function of bass, Treble, Loudness and Balance control. Consequences of mismatch between amplifier output and speaker impedance.

Need for a multi-speaker column. Cross over network in speaker columns with a separate heading as PA system. General ideas about public address system and its block diagram. **(8 Lectures)**

Unit IV

ACOUSTIC REVERBERATION:- Reverberation of sound. Absorption and Insulation of sound. Acoustics of auditorium sound in enclosures. Absorption

Coefficient of various acoustic materials. (No mathematical derivations). **(8 Lectures)**

Unit V

VIDEO SYSTEM:

a) **VCR AND VIDEO RECORDING:-** Block diagram of a VCR and explanation of its working. Basic principles of video recording and reproduction on discs by LASER technology. Material and formation of CD. Encoding of video signal, video format, Encoding of audio data for VCD. Block diagram of VCD player and description of main component. Basic principles of video recording and reproduction on discs by Digital technology.

b) VIDEO CAMERA:- Main features, Working principle, Area of application, Identification of various stages and main components, of single tube camera, ENG camera.

(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. The project will be evaluated by the external examiner.

TEXT BOOKS

1. A. Sharma- *Audio Video & TV Engineering*- Danpat rai & Sons.

2. Benson & Whitaker - *Television and Audio Handbook*- McGraw Hill Pub.

OPTICAL FIBER & COMMUNICATION

Fifth Semester

	L	T	P	C
Course Code: DEC 502	**3**	**2**	**-**	**4**

Course Contents:

Unit I

Introduction: Historical perspective, basic communication systems, optical frequency range, advantages optical fiber communication, application of fiber optic communication. **(Lectures 08)**

Unit II

Light Wave Fundamentals: Nature of light, acceptance angle and numerical aperture, electromagnetic waves, dielectric wave guide, modes in planar guide, dispersion and distortion in wave guide. **(Lectures 08)**

Unit III

Optical Fiber Waveguides: Fiber structure, step-index fiber, graded – index fiber, attention, modes in step, index and graded index fibers, pulse dispersion and information rate in optical fibers, construction of optical fibers, optical fiber cables. **(Lectures 08)**

Unit IV

Light Sources: Light emitting diodes (LEDs), Operating characteristics of LEDs, Laser principles, different types of lasers, laser diodes, operating characteristics of laser-diodes, distributed feedback laser diode, optical amplifier, fiber laser.

Light Detectors: Principles of photodetection, photomultiplier semiconductor photodiode, PIN diode and Avalanche Photo Diode (APD),comparison. Between PIN diode and APD.

(Lectures 08)

Unit V

Optical Fiber Joints: Fiber, alignment and joint loss, fiber end preparation, splices, connectors, source coupling.

Distribution Networks and Fiber Components: Distribution network, directional couplers, star couplers, switches, fiber optical isolators, attenuators, wave length division multiplexing.

(Lectures 08)

Project work

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

TEXT BOOKS

1. Joseph. C. Palais, *Optical Fiber Communication*, Pearson Education Publications, Published by Addison Wesley hangman (Singapore) Pte. Ltd., Delhi.
2. Gupta S.C., *Optical Fiber Communication and its Applications*, Prentice Hall India – New Delhi.
3. Agrawal G.P., *Fiber-Optic Communication Systems*, John Wiley and Sons, New Delhi.
4. John M. Senior, *Optical Fibers Communication*, Prentice Hall India, New Delhi.
5. Gower J., *Optical Communication Systems*, Prentice Hall India, New Delhi.

REFERENCE BOOKS

1. Gerd Keiser, *Optical Fiber Communication*, Mc Graw Hill, International Editions.
2. Franz & J.H, *Optical Communication: Components and Systems*, Narosa Publishing House Pvt. Ltd. Darya Ganj New Delhi
3. Donald J Sterling, *Technician Guide to Fiber-Optics*, Vikas Publishing House Pvt Ltd, Jangpura, New Delhi

INDUSTRIAL ELECTRONICS AND TRANSDUCERS
Fifth Semester

	L	T	P	C
Course Code: DEC 503	**3**	**2**	**-**	**4**

Course Contents:

Unit I

THYRISTORS AND THEIR APPLICATIONS:- Name, symbol and typical applications of members of thruster family. SCR, Triad and Diac-Basic structure, operation, V-I characteristics and ratings, gate circuits, ratings, triggering process and triggering circuits, turn off methods and circuits, selections of heat sinks, mounting of thruster on heat sinks, basic idea of protection of thruster circuits. Operation, V-I characteristics, equivalent circuit and parameters of an UJT: Description of UJT relaxation oscillator, use of UJT relaxation oscillator for triggering thrusters. Dias SCR and Triad switching circuits like automatic battery charger, voltage regulator, emergency light, alarm circuits, time delay relay circuits and circuits for over current and over voltage protection. Single phase, various types of phase controlled rectifiers using SCR for resistive and inductive load explanation using wave shapes and appropriate mathematical equation (No derivation). A.C. phase control using SCRs and triacs, Application of phase controlled rectifiers and A.C. phase control circuits in illumination control, temperature control, variable speed drives using DC motors and small AC machines. **(8 Lectures)**

Unit II

Half wave, full wave (including bridge) poly phase rectifiers using SCRs; explanation using wave shapes and formula (no derivation). Operation of three Phase Bridge controlled rectifier and its applications. Principles of operation of basic inverter circuits, basic series and parallel commutated inverters, principle of operation of cyclo-converter, choppers and dual converter, mention of applications.

PRINCIPLES AND APPLICATIONS OF INDUCTION AND DIELECTRIC HEATING: - Introduction, importance of heating in industry, Principle of induction heating, Industrial applications of induction heating, Principle of dielectric heating, Industrial applications of dielectric heating. **(8 Lectures)**

Unit III

TRANSDUCERS:-

Basic idea and principles of operation and their use in measuring physical parameters of the following types of transducers.

Transducer	**Typical Applications**
Variable Resistance Type	
Potentiometric Resistance	Displacement and force
strain gauge.	Torque and Displacement.
Resistance Thermometer.	Temperature.
The mister.	Temperature.
Variable Capacitance Type	
Variable capacitance pressure gauge.	Displacement and pressure.
Capacitor microphone.	Speed, noise
Dielectric gauge.	Liquid level & Thickness.
Variable Inductance Type	
Differential Transformer.	Pressure, force, displacement and position.
Magnetostrication gauge.	Force, pressure, sound.

Piezoelectric Type
Crystal Microphone, Crystal Oscillator. **(8 Lectures)**

Unit IV

PROCESSING OF TRANSDUCER SIGNALS: - Characteristics of instrumentation amplifiers in respect of input impedance, output impedance, drift, DC offset, noise, gain common mode rejection, frequency response etc. Relating the suitability of these characteristics for amplifying signals from various transducers. Block diagram and basic concept of open loop and closed loop systems. **(8 Lectures)**

Unit V

OPTOELECTRONIC DEVICES:- Basic principles and characteristics of photo sources and photo detector, Photo resisters, photo diodes, photo transistors, photo electric cells, LCDs, LEDs and photocopiers. LED- Material, Construction, Working, Power & Efficiency, Charactistics and modulation BW. Laser, Semiconductor Laser Photo Detectors - Optical detection Principles, P-N photodiode, Avalanche Photodiode. **(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. The project will be evaluated by the external examiner.

TEXT BOOKS

1. M. H. Rashid-*" Power Electronics Circuits, Devices & Application"*- P.H.I

2. J. Michael Jacob - *" Power Electronics: Principle and Application"* - Viks Publishing House Pvt. Ltd.

REFERENCE BOOKS

1. Singh Jasprit - *"Optoelectronics An Introduction to Materials and Devices*" - McGraw-Hill

2. C. S. Ranjan- *"Instrumentation Devices & Systems"*- Tata McGraw Hill.

CIRCUITS AND NETWORK

Fifth Semester

	L	T	P	C
Course Code: DEC 504	**3**	**2**	**-**	**4**

Course Contents:

Unit 1

Mesh & nodal analysis of network, introduction to complex numbers, equality of two complex numbers, expressing a real and an imaginary numbers as a complex numbers, conjugate of complex numbers, characteristics impedance, open & short circuit impedance, integrative & image impedance, two port parameters- Z, Y parameters, Reduction of complicated network:- Conversion from star to delta, delta to star, bridge T to T. **(Lectures 08)**

Unit II

Superposition Theorem, Thevenin's Theorem, Norton's Theorem, Maximum Power transfer theorem, Millman's Theorem. Resonant Circuits:- Series & parallel, Q factor, band width, universal resonance curve. **(Lectures 08)**

Unit III

Types of signals & transient response: - R-C, R-L, R-L-C network series, rise & fall times, inter relation of transient & frequency response, differentiating & integrating circuits. **(Lectures 08)**

Unit IV

Filters:- High Pass, low pass, band pass & band stop filters, constants K, M-derived (T, π, bridge, lattice), Terminations, half sections, composite filters. Attenuator & equalizers, Fixed Symmetrical, T- Bridge & lattice, Variable types. **(Lectures 08)**

Unit V

Coupling circuits: - Mutual Inductance, coefficient of coupling single & double, tuned transformer. **(Lectures 08)**

Project work

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

Text Books:

1. *Electronic circuit* by Chattopadhyay.
2. *Network analysis & synthesis* by Umesh Sinha.- Satya Pub. Delhi..

Reference Books:

1. Sudhakar & Shyammohan S.P., *Circuit & Networks: Analysis & design*- Tata Mc Grow Hill Publication.

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.**

AUDIO AND VIDEO SYSTEM LAB

Fifth Semester

	L	T	P	C
Course Code: DEC 551	**-**	**-**	**4**	**2**

LIST OF PRACTICAL'S

1. Study of different features and Measurement of directivity of various types of microphones and loudspeakers. (Approximate).
2. Draw the frequency response, bass and treble response of stereo amplifier.
3. Channel separation in stereo amplifier and measurement of its distortion.
4. Installation and operation of a stereo system amplifier. Fault finding in stereo chain.
5. Frequency response of crossover networks in speaker columns.
6. Familiarity with the working of drive mechanism of a tape recorder. Fault finding and preventive maintenance in tape recorders.
7. Installation and operations of PA system. (Preferably in auditorium).
8. Operation of VCR and familiarity with DC voltage wave shapes at major points and identification of different faults in a faulty VCR and their rectification.
9. Familiarity with the working of audio CD player and identification of main stages and components.
10. To study the operation and control of CD and DVD player and identification of main stages and components.
11. To study the operation and control of Colour Video Camera and identification of main stages and components.

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.

MINI PROJECT
(ELECTRONICS CIRCUIT DESIGN LAB)
Fifth Semester

	L	T	P	C
Course Code: DEC 552	**-**	**-**	**4**	**2**

Minor project work aims at exposing the students to industrial/field practices so as to have an appreciation of size, scale and type of operations; and work culture in the industries. The students will be able to comprehend concepts, principles and practices taught in the classroom and their application in solving field/industrial problems. The work done in minor project work will also prepare them in taking up problem solving at latter stage under major project work.

Depending upon the interests of the students and location of the organization the student may be asked for market study in the following cases:

1. Various types of cables available in the market, their current rating/specifications, different makes/manufacturing companies (minimum three), comparison of cost between different makes of cables.

2. Various types of domestic/wiring components such as switches, sockets, holders etc., their specifications, different makes or manufacturing companies (minimum three), comparison of cost between different makes of domestic/ wiring components.

3. Various types of protective devices used in domestic and industrial wiring such as MCBs, ELCB/RCCB, fuses etc. their specifications, make (minimum three), and comparison of cost between different makes of protective devices.

4. Various types of electric lamps (luminaries) available in the market, their specifications, different makes or manufacturing companies (minimum three), comparison of cost between different makes of electric lamps.

5. Various types of Electrical Appliances (domestic and commercial) available in the market, their specifications, different makes or manufacturing companies (minimum three), comparison of cost between different makes of electrical appliances. (Compare any one type)

NOTE:-The students of the class may be divided into five groups and work may be assigned to each group as per their interest.

The components of evaluation will include the following :

	Component	**Weightage**
a)	Punctuality and regularity	15%
b)	Initiative in learning new things	15%
c)	Relationship with others/workers	15%
d)	Project Report/ Technical report	55%

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 ELECTRONICS AND TRANSDUCERS LAB
Fifth Semester

	L	T	P	C
Course Code: DEC 553	**-**	**-**	**4**	**2**

LIST OF EXPERIMENT

1. Identification of various types of packages and terminals of various low and high power thrusters (SCR and Triad).

2. To determine and plot firing characteristics of SCR :-
(a) By varying the anode to cathode voltage.
(b) By varying the gate current.

3. Observing voltage wave shapes at various points of UJT relaxation oscillator circuit.

4. Observation of wave shapes at relevant points of the circuit of a single phase controlled rectifier using SCR and UJT relaxation oscillator.

5. To determine the firing characteristics of Triad in different mode i.e. Mode-I (plus), Mode-I (minus), Mode-III (plus), Mode-III (minus).

6. Observe the wave shapes and measure **AC** and d.c voltage at various points of a three phase bridge rectifier circuit.

7. Observe the wave shapes and measure **AC** and **DC** voltage at various points of a three phase SCR controlled bridge rectifier circuit.

8. Test an **AC** phase control circuit using triac and observe wave shapes and voltages at relevant points in circuit (while using for lamp intensity control and/or **AC** fan speed control).

9. To study the working of a single phase SCR/ transistor inverter circuit by observing wave shapes at input and output.

10. To measure force and pressure by using strain gauge transducer.

11. To observe the working of crystal microphone.

12. To observe the working principle of following devices in practical circuit :-
(a) Light Dependent Resistor (LDR).
(b) Photo electric cell.
(c) LED and LCDs.
(d) Avalanche Photodiode
(e) Optical fiber sensor

13. To measure voltages at different points of a circuit using a light sensitive device as ON-OFF control.

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.

CIRCUITS AND NETWORK LAB

Fifth Semester

	L	T	P	C
Course Code: DEC 554	**-**	**-**	**4**	**2**

List of Experiments:-

1. To convert Star Network into Delta Network.
2. To convert Delta Network into Star Network.
3. To Analysis Nodal and Mesh Network.
4. Verification of Superposition Theorem.
5. Verification of Norton Theorem.
6. Verification of Thevenin Theorem.
7. Verification of Maximum Power Transfer Theorem.
8. To determine the characteristic Impedance experimentally for a prototype high pass filter.

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 TRAINING
Semester V

Course Code: DEC555	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

DIGITAL SYSTEM DESIGN
Sixth Semester

	L	T	P	C
Course Code: DEC 601	**3**	**2**	**-**	**4**

Course Contents

Unit I

Analog Interfacing, SIGNAL conditioning, noise S/M ratio, spectrum analysis of analog signals, analog and digital conversion error. **(Lectures 08)**

Unit II

Combinational Circuits: Review of logic variables, Boolean expressions, Minimization of Boolean expressions using map method; Tabular method of function minimization, optimal realization of Boolean expressions using gates (SSI approach), Multiplexer/Decoder (MSI approach), ROM/PLA (LSI approach). **(Lectures 08)**

Unit III

Sequential Circuits Essential components of a sequential circuit, synchronous and asynchronous sequential circuits. Classification of sequential circuits (Mealy and Moore Machines Flip-flop as memory: RS, D, JK (including master slave), T, their excitation and characteristics (Truth-Tables), conversion of JK to D and T. **(Lectures 08)**

Unit IV

Generation of primitive state table / diagram, its minimization of states, state assignment, choice of memory element. Design of next state decoder (SSI, MSI approach). Worked examples for sequential system design, synchronization of asynchronous inputs, spikes in output and their removal. Design approach to asynchronous circuits, definitions of cycles, races and hazards. **(Lectures 08)**

Unit V

High Frequency problems ,High Frequency problems in digital systems interfacing digital systems with different media the coaxial cable and fiber cable. **(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 practical skill & knowledge.

Text Books:

1. Digital System,Principles And Application By Tocci, Ronald PHI Publication
2. Digital Design By Morris Mano

Reference Book:

1. Digital Circuits & Design By S. Salivahanan & S. Arivazhagan
2. Modern Digital Electronics By R.P. Jain

INDUSTRIAL ECONOMICS AND PRINCIPLES OF MANAGEMENT
Sixth Semester

	L	T	P	C
Course Code: DEC 602	**3**	**2**	**-**	**4**

Course Contents

Unit I

Nature and significance of Economics. Meaning of Science, Engineering and Technology and their relationship with economic development. **(Lectures 08)**

Unit II

The concept of demand and supply. Elasticity of Demand and Supply. Indifference Curve Analysis, Price Effect, Income Effect and Substitution Effect. **(Lectures 08)**

Unit III

Money and Banking: Functions of Money, Value of Money, Inflation and measures to control it. Brief idea of functions of banking system, viz., Commercial and central banking, Business fluctuations. **(Lectures 08)**

Unit IV

Nature and Significance of Management. Evaluation of Management thought, Contributions of Max Weber, Taylor and Fayola. **(Lectures 08)**

Unit V

Human Behavior: Factors of Individual Behavior, Perception, Learning and Personality Development, Interpersonal Relationship and Group Behavior. **(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 practical skill & knowledge.

Text Books:

1. Dewett, K.K., "*Modern Economic Theory*S.Chand & Co.
2. Luthers Fred "*Organizational Behaviour*",.

Reference Books:

1. Prasad L.M "*Principles of Management*",.
2. Stonier A.W. & D.C. Horgne, "*A Text Book of Economic Theory*", Oxford Publishing House Pvt. Ltd.

MICROPROCESSORS & APPLICATION
Sixth Semester

	L	T	P	C
Course Code: DEC 603	**3**	**2**	**-**	**4**

Course Contents:

Unit I

Evolution of Microprocessor, Typical organization of a microcomputer system and functions of its various blocks, Microprocessor, its evolution, function and impact on modern society. Architecture of a Microprocessor (With reference to 8085 microprocessor) Concept of Bus, bus organization of 8085 Functional block diagram of 8085 and function of each block, Pin details of 8085 and related signals, Demultiplexing of address/data bus of read/write control signals, Steps to execute a stored programme. **(Lectures 08)**

Unit II

Memories and I/O interfacing Memory organization, Concept of memory mapping, partitioning of total memory space. Address decoding, concept of I/O, mapped I/O and memory mapped I/O. Interfacing of memory mapped I/O devices. Concept of stack and its function Basic RAM Cell, N X M bit RAM, Expansion of word length and capacity, static and dynamic RAM, basic idea of ROM, PROM, EPROM and EEPROM. **(Lectures 08)**

Unit III

Programming (with respect to 8085 microprocessor),Brief idea of machine and assembly languages, Machines and Mnemonic codes., Instruction format and Addressing modes. Identification of instructions as to which addressing mode they belong., Concept of Instruction set. Explanation of the instructions of the following groups of instruction set ,Data transfer groups, Arithmetic Group, Logic Group, Stack, I/O and Machine Control Group., Programming exercises in assembly language. **(Lectures 08)**

Unit IV

Instruction Timing and Cycles ,Instruction cycle, machine cycle and T-states, Fetch and execute cycle. Interrupts: Concept of interrupt, Mask able and non mask able, Edge triggered and level triggered interrupts, Software interrupt, Restart interrupts and its use, Various hardware interrupts of 8085, Servicing interrupts, extending interrupt system. **(Lectures 08)**

Unit V

Data transfer techniques, Concept of programmed I/O operations, sync data transfer (hand shaking), Interrupt driven data transfer, DMA, Serial output data, Serial input data. Peripheral devices: 8255 PPI and 8253 PIT, 8257 DMA controller, 8279 Programmable KB/Display Interface., Communication Interface Adapter. **(Lectures 08)**

Project work

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

Text Books:

1. Ramesh S Gaonker*, Microprocessor Architecture, Programming and Applications with 8080/8085*, Willey Eastern Ltd. New Delhi
2. Dr BP Singh*, Microprocessor and Microcontrollers*, Galgotia Publications, New Delhi

Reference Books:

1. Refiquzzaman*, Microprocessor and Microcomputers*, Prentice Hall of India Ltd., New Delhi.
2. Mathur*, Introduction to Microprocessors*, Tata McGraw Hill, New Delhi

CONTROL SYSTEM
Sixth Semester

	L	T	P	C
Course Code: DEC 604	**3**	**2**	**-**	**4**

Course Contents:

Unit I

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 II

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 III

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 Tacho generator, derivation of transfer function by block reduction technique and signal flow graph. **(Lectures 08)**

Unit IV

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 V

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). **(Lectures 08)**

Project work

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

Text Books:

1. 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

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.**

MAJOR PROJECT LAB
Sixth Semester

	L	T	P	C
Course Code: DEC 651	**-**	**-**	**8**	**4**

Students should devote themselves to make a project which preferably should be a working model of their thoughts based on their subject of choice.
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.
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 working day of the VIII semester, date of which shall be notified in the academic calendar.
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 50 marks. The student shall present the final project live as also using overhead projector or power point presentation on LCD to the internal committee as also the external examiner.
The evaluation committee shall consist of faculty members constituted by the college which would be comprised of at-least three members- 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.
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 Director – 25 marks
External: 50 marks
By External examiner appointed by the University – 50 marks

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 & APPLICATION LAB
Sixth Semester

	L	T	P	C
Course Code: DEC 653	**-**	**-**	**4**	**2**

LIST OF EXPERIMENTS:

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.

CONTROL SYSTEM LAB
Sixth Semester

	L	T	P	C
Course Code: DEC 654	**-**	**-**	**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.