Department of Electronics & Communication Engineering
SEMESTER-I

Course Title: English and Communication Skills–I	Max. Marks: 100
Course Code: DECE-101	University Examination: 60
Duration of Exam: 3 Hrs	Sessional Assessment: 40

Objective:
Language is the most commonly used medium of self-expression in all spheres of human life – personal, social and professional. A student must have a fair knowledge of English language and skills to communicate effectively to handle the future jobs in industry. The objective of this subject is to enable the diploma holders to acquire proficiency, both in spoken (oral) and written language. At the end of the subject, the student will be able to develop comprehension skills, improve vocabulary, use proper grammar, acquire writing skills, correspond with others and enhance skills in spoken English. It is expected that each polytechnic will establish a **communication skill laboratory** for conducting practical's mentioned in the curriculum.

UNIT-I
Facets of Literature-I (Short Stories & Poems)
Short Stories:
1. Homecoming – R.N. Tagore
2. The Selfish Giant - Oscar Wilde
Poems:
1. Daffodils – William Wordsworth
2. Stopping by Woods on a Snowy Evening – Robert Frost

UNIT-II
Facets of Literature-II (Prose)
1. I Have A Dream – Martin Luther King
2. On Habits – A. G. Gardiner
3. On Seeing People Off – Max Beerbohm

UNIT-III
Grammar and Usage
Parts of speech: Nouns, Pronouns, Adjectives, Articles, Verbs, Adverbs, Prepositions. Identifying parts of speech, Structures: Verb patterns and Question tags. Pair of words (Words commonly confused and misused): Tenses, Correction of incorrect sentences, one word Substitution

UNIT-IV
Translation, Paragraph and Compression
Translation of Glossary of Administrative Terms from English into Urdu/Hindi, Translation from Urdu/Hindi into English. Paragraph of 100-150 words from outlines.
Comprehension: Unseen passages of literacy, scientific, data/graph based for comprehension exercises.

UNIT-V

Communication

Definition, Introduction and Process of Communication, Objectives of Communication. Notices.

Course Outcome

CO 1.Communicate effectively verbal as well as in writing in English
CO 2 Comprehend given passage and summarize them.
CO 3. Draft official letters.
CO 4. Apply correct voice and prepositions in formal communication.
CO 5. Make sentence using connector for desire meaning

REFRENCES

1. English and Communication Skills, Book-I By Kuldip Jaidka, Alwainder Dhillon and Parmod Kumar Singla, Prescribed by NITTTR, Chandigarh Published By Abhishek Publication, 57-59, Sector-17, Chandigarh.
2. Essentials of Business Communication by Pal & Rorualling; Sultan Chand & Sons.
3. The Essence of Effective Communication, Ludlow and Panthon; Prentice Hall of India
4. New Design English Grammar, Reading and Writing Skills by AL Kohli (Course A and course B), Kohli Publishers, 34 Industrial Area Phase-II, Chandigarh,
5. New Design English Reading and Advanced Writing Skills for Class XI and XII by MK Kohli and AL Kohli; Kohli Publishers, 34 Industrial Area Phase-II, Chandigarh.
6. A Practical English Grammar by Thomson and Marlinet
7. Spoken English by V Sasikumar and PV Dhamija; Tata McGraw Hill
8. English Conversation Practice by Grount Taylor; Tata McGraw Hill
9. Developing Communication Skills by Krishna Mohan and Meera Banerji; MacMillan India Ltd., Delhi
10. Business Correspondence and Report Writing by RC Sharma and Krishna Mohan; Tata McGraw Hill Publishing Company Ltd. New Delhi
11. Communication Skills by Ms R Datta Roy and KK Dhir; Vishal Publication, Jalandhar.

NOTE FOR PAPER SETTER: The question paper shall comprise of 80 marks. Two questions will be set from each unit. The student has to attempt five questions, at least one from each unit.

Department of Electronics & Communication Engineering
SEMESTER-I

Course Title: Applied Mathematics–I Max. Marks: 100
Course Code: DECE-102 University Examination: 60
Duration of Exam: 3 Hrs Sessional Assessment: 40

Objective:

Applied Mathematics forms the backbone of engineering students. Basic elements of algebra, trigonometry, coordinate geometry have been included in the curriculum as foundation course. This course will develop analytical abilities to make exact calculations and will provide continuing educational base to the students.

UNIT-I
Algebra
Arithmetic progression, its nth term, sum of n terms with their applications to engineering problems. Geometrical progression, its nth term and sum of n terms and to infinity with application to engineering problems; Partial fractions (linear factors, repeated linear factors, non-reducible quadratic factors excluding repeated factors)

UNIT-II
Permutations, Combinations & Binomial Theorem
Concept of permutations and Combinations: Value of ${}^{n}p_{r}$ ${}^{n}c_{r}$.
Binomial theorem (without proof) for positive integral index (expansion and general form); binomial theorem for any index (expansion without proof)

UNIT-III
Trigonometry
Concept of angles, measurement of angles in degrees, grades and radians and their conversions.
Review of ratios of some standard angles (0, 30, 45, 60, 90 degrees), T-Ratios of Allied angles (without proof), Sum, difference formulae and their applications (without proof). Product formulae (Transformation of product to sum, difference and vice versa). T-Ratios of multiple angles, sub-multiple angles (2A, 3A, A/2).

UNIT-IV
Co-Ordinate Geometry-I
Cartesian and Polar coordinates (two dimensional), conversion from Cartesian to polar coordinates and vice-versa, distance between two points (Cartesian co-ordinates), section formulae.

Area of triangle when its vertices are given, co-ordinates of centroid, in center of a triangle when the vertices are given, simple problems on locus.

UNIT-V

Co-Ordinate Geometry-II

Equation of straight line in various standard forms (without proof), inter section of two straight lines, angle between two lines, perpendicular distance formula (without proof)
General equation of a circle and its characteristics.

To find the equation of a circle, given:

* Centre and radius
* Three points lying on it
* Coordinates of end points of a diameter

Course: Outcome

CO 1.To understand basics and applications of Algebra Permutations, Combinations & Binomial Theorem, determinants, matrices
CO 2. To understand trigonometry, coordinate geometry
CO 3. Comprehensive knowledge of basic mathematics

REFRENCES

1. Elementary Engineering Mathematics by BS Grewal, Khanna Publishers, New Delhi
2. Engineering Mathematics by Vol. I & II by S Kohli, IPH, Jalandhar
3. Applied Mathematics by Dr. RD Sharma
4. Applied Mathematics, Vol. I & II by SS Sabharwal & Sunita Jain, Eagle Parkashan, Jalandhar
5. Comprehensive Mathematics, Vol. I & II by Laxmi Publications
6. Engineering Mathematics by Dass Gupta
7. Engineering Mathematics by C Dass Chawla, Asian Publishers, New Delhi
8. Comprehensive Mathematics, Vol. I & II by Laxmi Publications
9. Engineering Mathematics, Vol I, II & III by V Sundaram et.al, Vikas Publishing House (P) Ltd., New Delhi
10. Engineering Mathematics by N.Ch.S.N Iyengar et.al, Vikas Publishing House (P) Ltd., New Delhi
11. Engineering Mathematics, Vol-I & II by SS Sastry, Prentice Hall of India Pvt Ltd.,
12. Engineering Mathematics, Vol I & II by AK Gupta, MacMillan India Ltd., New Delhi

NOTE FOR PAPER SETTER: The question paper shall comprise of 80 marks. Two questions will be set from each unit. The student has to attempt five questions, at least one from each unit.

Department of Electronics & Communication Engineering
SEMESTER-I

Course Title: Applied Physics–I
Course Code: DECE-103
Duration of Exam: 3 Hrs

Max. Marks: 100
University Examination: 60
Sessional Assessment: 40

Objective:

Applied physics includes the study of a large number of diverse topics all related to things that go on in the world around us. It aims to give an understanding of this world both by observation and by prediction of the way in which objects will behave. Concrete use of physical principles and analysis in various fields of engineering and technology are given prominence in the course content.
Note: Teachers should give examples of engineering/technology applications of various concepts and principles in each topic so that students are able to appreciate learning of these concepts and principles.

UNIT-1
Units and Dimensions
Physical quantities, Fundamental and derived units, Systems of units (CGS, MKS and SI units), Dimensions and dimensional formulae of physical quantities (area, volume, velocity, acceleration, momentum, force, impulse, work, power, energy, surface tension, gravitational constant, density). Coefficient of viscosity, stress, strain and elasticity)
Principle of homogeneity
Uses of Units and Dimensions:
(a) Conversion of one system of unit into another
(b) Determination of formula of a physical quantity such as time period of simple pendulum and determination of formula for centripetal force by the method of units and dimensions
(c) Knowing the correctness of a physical equation
Limitations of dimensional analysis

UNIT-1I
Force and Motion
Scalar and vector quantities–definitions with examples. Simple addition and multiplication of scalar and vector quantities. Force - resolution and composition of forces, Parallelogram Law of forces with the derivation for the resultant force and direction of the resultant force. Newton's Laws of motion – concept of momentum and their application, determination of force equation from Newton's second law of motion, derivation of Newton's third law of motion from 2^{nd} Law, impulse and impulsive forces, simple numerical problems. Projectile motion - horizontal and oblique and their equation.
Derivation and definitions of Time of flight, Maximum height, Horizontal range and the condition for the maximum range. Linear and angular velocity and acceleration with their relations. Circular

motion – centripetal force and centrifugal force in detail. Banking of roads and rails, bending of a cyclist.

UNIT-III

Work, Power and Energy

Work: definitions and its SI units. Work done in moving an object on horizontal and inclined plane (incorporating frictional forces). Power: definitions and its SI units, calculation of power in simple cases.

Energy: Definitions and its SI units, Kinetic energy and Potential energy with examples and their derivation. Principle of conservation of energy (for freely falling bodies), transformation of energy from one form to another.

UNIT-IV

Simple Harmonic Motion and Rotational Motion

Definition of simple harmonic motion relation for the displacement, velocity, acceleration, and time period of a body executing simple harmonic motion, Free, forced and resonant vibrations with examples

Definitions of torque and angular momentum, radius of gyration

Derivation of rotational kinetic energy and hence definition of moment of inertia

Conservation of angular momentum and applications

UNIT-V

Temperature and Transfer of Heat

Difference between heat and temperature on the basis of K.E. of molecules, Principles of measurement of temperature and different scales of temperature**,** Bimetallic and Platinum resistance thermometer: their merits and demerits, Pyrometers–Disappearing filament optical pyrometer.

Modes of transfer of heat (conduction, convection and radiation with examples), Coefficient of thermal conductivity. Determination of coefficient of thermal conductivity of good conductor by Searle's method and bad conductor by Lee's disc method, Properties of heat radiation. Black body radiation-Stefan's law, Kirchhoff's law, Wien's law, in case of black body radiations. Prevost's theory of heat exchange

Course: Outcome

CO 1: .Identify general properties of matters.

CO 2:Use and application of different measuring instruments.

CO 3: Apply principles and concept of physics for solving various engineering problems.

CO4: To understand the basic concepts of Units and Dimensions

CO5: To acquaint the students with the practical skills of force and motion.

REFRENCES

1. Applied Physics Vol. I, TTTI Publication Tata McGraw Hill, Delhi
2. Basic Applied Physics by RK Gaur; Dhanpat Rai Publications
3. Comprehensive Practical Physics - Volume I and II by JN Jaiswal; Laxmi Publishers

4. Numerical Problems in Physics - Volume I and II by RS Bharaj; Tata McGraw Hill
5. Simple Course in Electricity and Magnetism by CL Arora; S Chand and Co, New Delhi
6. Fundamental Physics - Volume I and II by Gomber and Gogia; Pardeep Publications, Jalandhar
7. A Text Book of Optics by Subramanian and Brij Lal
8. Physics Laboratory Manual by PK Palanisamy, Scitech Publications
9. Fundamentals of Physics by Resnick and Halliday, Asian Books Pvt. Ltd., New Delhi
10. Concepts in Physics by HC Verma; Bharti Bhawan Ltd., New Delhi

NOTE FOR PAPER SETTER: The question paper shall comprise of 80 marks. Two questions will be set from each unit. The student has to attempt five questions, at least one from each unit.

Department of Electronics & Communication Engineering
SEMESTER-I

Course Title: Electronic Components and Materials
Course Code: ECE - 104
L T P
4 0 0

Max. Marks: 100
External: 60
Internal Assessment: 40
Duration of Exam: 3 Hrs

Objective

A diploma holder in Electronic Engineering will be involved in maintenance, repair and production of electronic equipment and systems. In addition, he may be required to procure, inspect and test electrical and electronic engineering materials. Knowledge of various types of materials/components will be needed in order to execute the above mentioned functions. He may also have to decide for an alternative when a particular material is either not readily available in the market or its cost becomes prohibitive.

UNIT-I

Materials-I

Classification of materials: Conducting, semi-conducting and insulating materials through a brief reference to their atomic structure.

Magnetic Materials: Different Magnetic materials; (Dia, Para, Ferro) and their properties. Ferro magnetism, Domains, permeability, Hysteresis loop. Soft and hard magnetic materials, their examples and typical applications.

UNIT-II

Materials-II

Conducting Materials: Resistors and factors affecting resistivity such as temperature, alloying and mechanical stressing. Classification of conducting materials into low resistivity and high resistivity materials.

Insulating Materials: Important characteristics (electrical, mechanical and thermal) and applications of the following material:

Mica, Glass, Copper, Sliver, PVC, Silicon, Rubber, Bakelite, Cotton, Ceramic, Polyester, Polythene and Varnish.

UNIT-III

Capacitors

Concept of capacitance and capacitors, units of capacitance, types of capacitors, constructional details and testing specifications. Capacity of parallel plate capacitors, spherical capacitors, cylindrical capacitor. Energy stored in a capacitor.

Concept of di-electric and its effects on capacitance, di-electric constant, break down voltage. Series and parallel combination of capacitor. Simple numerical problems of capacitor. Charging and discharging of capacitor with different resistances in circuit, concept of current growth and decay, time constant in R-C circuits, simple problems.

UNIT-IV

Resistors & Transformers

Resistors: Carbon film, metal film, carbon composition, wound and variable types (presets and potentio-meters).

Working principle and construction of Transformer

UNIT-V

Connectors

Different types of connectors, relays, switches and cables, their symbols, specifications, construction, types, applications and their testing.

Course outcome

CO1: Able to identify the components.

CO2: Understand the composition of electronic materials

CO3: Able to make the data sheet of components.

CO4: able to make small circuits like rectifiers, amplifiers.

RECOMMENDED BOOKS

1. Electronic components and Materials by Grover and Jamwal; Dhanpat Rai and Sons, New Delhi
2. Basic Electronics and Linear Circuits by NN Bhargava and Kulshreshta; Tata McGraw Hill, New Delhi
3. Electronic components and Materials by SM Dhir, Tata McGraw Hill, New Delhi
4. Electrical and Electronic Engineering Materials by SK Bhattacharya, Khanna Publishers, New Delhi
5. Electronic Engineering Materials by ML Gupta, Dhanpat Rai and Sons; New Delhi.

NOTE FOR PAPER SETTER: The question paper shall comprise of 80 marks. Two questions will be set from each unit. The student has to attempt five questions, at least one from each unit.

Department of Electronics & Communication Engineering
SEMESTER-I

Course Title: Engineering Drawing-I — Max. Marks: 100
Course Code: DECE-105 — University Examination: 60
Duration of Exam: 3 Hrs — Sessional Assessment: 40

Objective:
Drawing is said to be the language of engineers and technicians. Reading and interpreting engineering drawing is their day-to-day responsibility. The course is aimed at developing basic graphic skills so as to enable them to use these skills in preparation of engineering drawings, their reading and interpretation. The emphasis while imparting instructions should be to develop conceptual skills in the students.

Note: 1. First angle projection is to be followed

2. Instruction relevant to various drawings may be given along with appropriate demonstration, before assigning drawing practice to the students

UNIT-I
Drawing Office Practice, Lines, Lettering and Dimensioning
Drawing instruments, Sizes and layout of standard drawing sheets, Sizes of drawing boards, drafting table/board.
Different types of lines in engineering drawing as per BIS specifications, Instrumental single stroke (vertical and inclined gothic) lettering of 35 mm height in the ratios of 7:4, Instrumental double stroke lettering of 35 mm height in the ratio of 7:4, vertical. Free hand lettering (alphabet and numerals) lower case and upper case, single stroke vertical and inclined at 75 degree in different standard series of 2.5, 3, 5, 7, 10, and 15 mm heights in the ratio of 7:4. Necessity of dimensioning - methods and principles. Dimensioning of overall sizes, circles, thread holes, chamfered surfaces, angles, tapered surface holes equally spaced on PCD, counter sunk hole counter bored holes, cylindrical parts, narrow space and gaps, radii, curves and arches – chain and parallel dimensioning

UNIT-II
Simple Geometrical Constructions & Scale
Construction of regular polygons (triangle, square, pentagon, hexagon) and circles, Ellipses (concentric circle method and oblong method), Parabola (rectangle and tangent method). Curves (cycloid and helix).
Scales – their need and importance, Definition of representative fraction (RF); Finding RF of a given scale, Types of scales, Construction of plain and diagonal scales.

UNIT-III
Principle of Projections
Principle of orthographic projection, Planes of projection, four quadrants, first angle projection and third angle projection, Projection of points situated in different quadrants. Projection of

lines, Lines inclined to one plane and parallel to the other and vice versa Projection of Planes: Planes perpendicular and parallel to either of the planes; planes perpendicular to one plane and parallel to the other or vice versa. Projection of solids, such as Prism, Cube, Cylinder and Cones with axis perpendicular to horizontal plane or parallel to horizontal plane/vertical plane or both. Drawing 3 orthographic views of given objects (at least five objects). Identification of surfaces on drawn orthographic views from isometric object drawn. Exercises on missing lines, surfaces and views.

UNIT-IV

Sectional Views & Isometric Views

Need for sectional views – conventional sections of various materials. Drawing of different conventions for materials in sections, conventional breaks for shafts, pipes, rectangular, square, angle, channel and rolled sections.

Fundamentals of isometric projections (theoretical instructions) and isometric scales. Isometric views from 2 or 3 given orthographic views

UNIT-V

Development of Surfaces (2 sheets):

Development of surfaces – cubes, prisms, (square, pentagonal and hexagonal), cylinders, pyramids (square, pentagonal, hexagonal) and cones

Course: Outcome

CO 1.Identify and use differing drawing tools/instruments.

CO 2 Use the concept of projection for Mechanical Engineering Drawings.

CO 3. Prepare engineering drawing manually with given geometrical dimensions using prevailing drawing standards using proper scale.

CO 4 Visualize and draw the shape of simple object form orthographic view to vise versa

RECOMMENDED BOOKS

1. Elementary Engineering Drawing (in first angle projection) by ND Bhatt, Charotar Publishing House
2. A Text Book of Engineering Drawing by Surjit Singh published by Dhanpat Rai and Co., Delhi
3. Engineering Drawing by PS Gill published by SK Kataria and sons, Delhi
4. Engineering Drawing by RB Gupta published by Satya Prakashan, New Delhi

NOTE FOR PAPER SETTER: The question paper shall comprise of 80 marks. Two questions will be set from each unit. The student has to attempt five questions, at least one from each unit.

Department of Electronics & Communication Engineering
SEMESTER-I

Course Title: English & Communication Skills-I Lab	Max. Marks: 50
Course Code: DECE-111	University Examination: 25
Duration of Exam: 2 Hrs	Internal Examination: 25

LIST OF PRACTICALS

1. Locating a Book in Library
2.
3. How to look up words in a Dictionary: meaning and pronunciation of words as given in the standard dictionary using symbols of phonetics.
4. How to Seek Information from an Encyclopedia
5. Listening pre-recorded English language learning programme
6. Paper Reading before an audience (reading unseen passages)
7. Study of spelling Rules
8. Study of essentials of a Good Speech to respond and comprehend visual, oral themes, situations or stimulus and practice before select gathering
9. Exercises on use of different abbreviations
10. Greetings for different occasions
11. Introducing oneself, others and leave taking
12. Exercises on writing sentences on a topic

Course Outcome

CO1 To have practical exposure to the basic language techniques in professional
CO 2 Comprehend given passage and summarize them.
CO 3. Draft official letters.
CO 4. Apply correct voice and prepositions in formal communication.
CO 5. Make sentence using connector for desire meaning.
CO 6 Develop presentation skills.
CO 7. Face oral examination and interviews

Department of Electronics & Communication Engineering
SEMESTER-I

Course Title: Applied Physics-I Lab
Course Code: DECE-112
Duration of Exam: 2 Hrs

Max. Marks: 50
University Examination: 25
Internal Examination: 25

LIST OF PRACTICALS

1. To find he radius and diameter of given wire by screw gauge
2. To find the volume of cylinder (hollow and solid) by vernier caliper
3. To find the thickness of glass strip by spherometer
4. Draw a graph between the load and depression in case of cantilever
5. To determine the coefficient of linear expansion of a given metal rod
6. To find the coefficient of thermal conductivity of a bad conductor by Lee's Disc Method
7. Top find the energy of a body dropped from certain height
8. To find the coefficient of thermal conductivity of metal using searles apparatus
9. To find the atmospheric pressure using Fortins Barometer.

Course outcome

After completing this course the student will be able to
CO1: Have a thorough knowledge and use of Screw guage ,Vernier caliper
CO2: find out the thickness glass strip of spherometer.
CO3: understand the use of Barometer.

Department of Electronics & Communication Engineering
SEMESTER-I

Course Title: Basic Information Technology Lab — Max. Marks: 50
Course Code: DECE-113 — University Examination: 25
Duration of Exam: 2 Hrs — Internal Examination: 25

LIST OF PRACTICALS

1. Given a PC, name its various components and list their functions
2. Identification of various parts of a computer and peripherals
3. Practice in installing a computer system by giving connection
4. DOS Commands (internal / external) e.g. TYPE, REN, DEL, CD, MD, COPY, TREE, BACKUP
5. Exercises on entering text and data (Typing Practice using any tutor)
6. Features of Windows as an operating system
   - Start
   - Shutdown and restore
   - Creating and operating on the icons
   - Opening closing and sizing the windows
   - Using elementary job commands like – creating, saving, modifying, renaming, finding and deleting a file
   - Creating and operating on a folder
   - Changing setting like, date, time color (back ground and fore ground)
   - Using short cuts
   - Using on line help
7. MS-Word
   - File Management:
     Opening, creating and saving a document, locating files, copying contents in some different file(s), protecting files, Giving password protection for a file
   - Page Set up:
     Setting margins, tab setting, ruler, indenting
   - Editing a document:
     Entering text, Cut, copy, paste using tool- bars
   - Formatting a document:
     Using different fonts, changing font size and colour, changing the appearance through bold/ italic/ underlined, highlighting a text, changing case, using subscript and superscript, using different underline methods
   - Aligning of text in a document, justification of document, Inserting bullets and numbering
   - Formatting paragraph, inserting page breaks and column breaks, line spacing
   - Use of headers, footers: Inserting footnote, end note, use of comments
   - Inserting date, time, special symbols, importing graphic images, drawing tools
   - Tables and Borders:

Creating a table, formatting cells, use of different border styles, shading in tables, merging of cells, partition of cells, inserting and deleting a row in a table

- Print preview, zoom, page set up, printing options
- Using Find, Replace options
- Using Tools like:
  Spell checker, help, use of macros, mail merge, thesaurus word content and statistics, printing envelops and labels
- Using shapes and drawing toolbar,
- Working with more than one window in MS Word,
- How to change the version of the document from one window OS to another
- Conversion between different text editors, software and MS word

8. MS-Excel
   - Starting excel, open worksheet, enter, edit, data, formulae to calculate values, format data, create chart, printing chart, save worksheet, switching between different spread sheets
   - Menu commands:
     Create, format charts, organize, manage data, solving problem by analyzing data, exchange with other applications. Programming with MS-Excel, getting information while working
   - Work books:
     Managing workbooks (create, open, close, save), working in work books, selecting the cells, choosing commands, data entry techniques, formula creation and links, controlling calculations, working with arrays
   - Editing a worksheet, copying, moving cells, pasting, inserting, deletion cells, rows, columns, find and replace text, numbers of cells, formatting worksheet
   - Creating a chart:
     Working with chart types, changing data in chart, formatting a chart, use chart to analyze data
   - Using a list to organize data, sorting and filtering data in list
9. MS PowerPoint
   a) Introduction to PowerPoint
      - How to start PowerPoint
      - Working environment: concept of toolbars, slide layout, templates etc.
      - Opening a new/existing presentation
      - Different views for viewing slides in a presentation: normal, slide-sorter etc.

   b) Addition, deletion and saving of slides
   e) How to view the slide show?
      - Viewing the presentation using slide navigator
      - Slide transition
      - Animation effects etc.
10. Internet and its Applications
    a) Log-in to internet
    b) Navigation for information seeking on internet
    c) Browsing and down loading of information from internet

d) Sending and receiving e-mail

- Creating a message
- Creating an address book
- Attaching a file with e-mail message
- Receiving a message
- Deleting a message

Course outcome

CO1: Identify the various components of a Computer system
CO2: Differentiate between hardware and software
CO3 :State the functions of each component of a computer a system
CO4: State the configuration of a computer system
CO5: Identify the various peripherals
CO6: Know how to open an application program CO7: Know how to create a folder in a specified location
CO8 Open MS-word and Identify the components on the screen.
CO9 Open MS-Excel and identify the components.
CO10: Create a Worksheet in MS-Excel and save

RECOMMENDED BOOKS

1. Fundamentals of Computer by V . Rajaraman; Prentice Hall of India Pvt. Ltd., New Delhi
2. Computers Today by SK Basandara, Galgotia Publication Pvt ltd. Daryaganj, New Delhi.
3. MS-Office 2000 for Everyone by Sanjay Saxena; Vikas Publishing House Pvt. Ltd., New Delhi
4. Internet for Every One by Alexis Leon and Mathews Leon; Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi
5. A First Course in Computer by Sanjay Saxena; Vikas Publishing House Pvt. Ltd., Jungpura,New Delhi
6. Mastering Windows 95, BPB Publication, New Delhi
7. Computer Fundamentals by PK Sinha; BPB Publication, New Delhi
8. Fundamentals of Information Technology by Leon and Leon;Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi
9. On Your Marks - Net…Set…Go… Surviving in an e-world by Anushka Wirasinha, Prentice Hall of India Pvt. Ltd., New Delhi
10. Learning MS Office XP by Ramesh Bangia, Khanna Book Publishing Co. (P)

Department of Electronics & Communication Engineering
SEMESTER-I

Course Title: Engineering Drawing-I
Course Code: DECE-114
Duration of Exam: 2 Hrs

Max. Marks: 50
University Examination: 25
Internal Examination: 25

LIST OF PRACTICALS

1. Drawing Office Practice, Lines, Lettering and Dimensioning (4 sheets):
2. Simple Geometrical Constructions & Scale (4 sheets):
3. Principle of Projections (6 sheets):
4. Sectional Views & Isometric Views (3 sheet):
5. Development of Surfaces (2 sheets):

Course outcome:

CO1: Able to draw Orthographic projections of Lines, Planes, and Solid.
CO2: Able to construct Isometric Scale, Isometric Projections and Views.
CO3: Able to draw Sections of various Solids including Cylinders, cones, prisms and pyramids.
CO4: Able to draw projections of lines, planes, solids, isometric projections and sections of solids including Cylinders, cones, prisms and pyramids using AutoCAD

RECOMMENDED BOOKS

1. Elementary Engineering Drawing (in first angle projection) by ND Bhatt, Charotar Publishing House
2. A Text Book of Engineering Drawing by Surjit Singh published by Dhanpat Rai and Co., Delhi
3. Engineering Drawing by PS Gill published by SK Kataria and sons, Delhi
4. Engineering Drawing by RB Gupta published by Satya Prakashan, New Delhi

Department of Electronics & Communication Engineering
SEMESTER-I

Course Title: General Workshop Practice-I — Max. Marks: 150
Course Code: DECE-115 — University Examination: 75
Duration of Exam: 2 Hrs — Internal Examination: 75

Objective:
In order to have a balanced overall development of diploma engineers, it is necessary to integrate theory with practice. General workshop practices are included in the curriculum in order to provide hand on experience about use of different tools and basic manufacturing practices. This course aims at developing general manual and machining skills in the students. Besides above, the development of dignity of labour, precision, safety at work place, team working and development of right attitude are the other objectives.

LIST OF PRACTICALS

1. Carpentry & Painting Shop-I:

Introduction to various types of wood by demonstration and their identification. Demonstration, function and use of commonly used hand tools. Care, maintenance of tools and safety measures to be observed.

Job I Marking, Sawing and planning practice
Job II Extensive planning practice
Job III Chiseling practice

Introduction to joints, their relative advantages and uses.

Job IV Preparation of half lap joint
Job V Preparation of Mortise and Tenon Joint

Importance and need of polishing wooden items, Introduction to polishing materials.

Job VI Preparation of surface before polishing.
Job VII Application of primer coat.
Job VIII Polishing on wooden items.

2. Fitting and Plumbing Shop-I

Introduction to fitting shop, Common materials used in fitting shop, Identification of materials. Description and demonstration of various types of work benches. Holding devices and files, Precautions while filing.

Job I Filing practice (Production of flat surfaces) Checking by straight edge.
Job II Marking of jobs, use of marking and measuring tools.
Job III Filing a dimensioned rectangular or Square piece of an accuracy of +0.25mm.

Introduction to chipping, Demonstration on chipping and its applications. Demonstration and function of chipping tools.

Job IV Chipping practice

Description & demonstration of simple operation of hacksawing, demonstration and description of various types of blades, their uses and method of fitting the blade.

Job V Making a cutout from a square piece of iron block using hacksaw.

3. Welding Shop-I

Introduction to welding and its importance in engineering practice; types of welding; common materials that can be welded.

Electric arc welding, (AC and DC) precautions while using electric arc welding, Practice in setting current and voltage for striking proper arc.

Job I Practice of striking arc while using electric arc welding set.

Job II Welding practice job on arc welding for making uniform and straight weld beads.

Common welding defects and inspection. Various types of joints and end preparation.

Job III Preparation of butt joint arc welding.

Job IV Preparation of lap joint by arc welding.

Job V Preparation of single V/double V butt joint by using electric arc welding.

Job VI Preparation of Tee joint by arc welding.

4. Forging shop

Introduction to forging, forging tools, tongs, blowers/pressure blowers, hammers, chisels, punch, anvil, swag-block etc. Forging operations.

Job I Forge a L hook or Ring from MS rod 6 mm ϕ

Job II Forge a chisel and give an idea of hardening and tempering

Job III Lap joint with forge welding

Job IV High Strength Steel (HSS) tools – forging of Lathe shaper tools like side-tools and V-shape tools

5. Electric & Electronic Shop-I

Study and demonstration of common electrical materials such as wires, cables, switches, fuses, ceiling roses, battens, cleats and allied items, tools and accessories such as multi-meter, CRO, types of resisters (colour code) and potentiometers.

Job I Identification of phase, neutral and earth of domestic appliances and their connection to two pin/three pin plugs.

Job II Laying out of complete wiring of a house (i) batten wiring (ii) plastic casing and capping.

Job III Testing and rectification of simulated faults in household appliances such as iron, kettles, water-heaters, fans and mixers.

Job IV Battery connections in series and parallel and battery testing with the help of hydrometers and cell testers.

Job V Cut, strip, join and insulate wires & cables.

Job VI Unsoldering and soldering of resister, capacitor, diodes, transistors on a PCB.

Job VII joining, mounting and dismantling of plugs, sockets, connectors, Bana plugs and terminal strips.

Job VI De-solder and clean all the components and wires from a given equipment, a PCB or a tag strip including sleeving and use of identified tags.

Course Outcome

CO1: Able to study and practice on machine tools and their operations.

CO2: Able to practice on manufacturing of components using workshop trades including fitting, carpentry, foundry and welding.

CO3: Able to identify and apply suitable tools for machining processes including turning,

facing, thread cutting and tapping.
CO4: Able to apply basic electrical engineering knowledge for house wiring practice

RECOMMEND BOOKS

1. Manual on Workshop Practice by K Venkata Reddy, KL Narayana and P Kaunaioh; MacMillan India Ltd., New Delhi
2. Basic Workshop Practice Manual by T Jeyapoovan; Vikas Publishing House (P) Ltd., New Delhi.

Note:

The students are supposed to come in proper workshop dress prescribed by the institute. Wearing shoes in the workshop(s) is compulsory. Importance of safety and cleanliness, safety measures and upkeep of tools, equipment and environment in each of the following shops should be explained and practiced. The students should prepare sketches of various tools/jobs in their practical Notebook.

SEMESTER-I

Course Title: Student Centred Activities
Course Code: DCE/DEE/DME/DECE-117
L T P
0 0 4

Max. Marks: 50
Internal Assessment: 50

SCA will comprise of co-curricular activities like extension lectures, library studies, games, hobby clubs e.g. photography, painting, singing, seminars, declamation contests, educational field visits, N.C.C., NSS, Cultural Activities, Civil Defence/ Disaster Management activities etc.

Department of Electronics & Communication Engineering
SEMESTER-II

Course Title: English and Communication Skills–II	Max. Marks: 100
Course Code: CE/ERE/ME/ECE - 201	External: 60
L T P	Internal Assessment: 20
4 0 0	Duration of Exam: 3 Hrs

Objective:
Language is the most commonly used medium of self-expression in all spheres of human life – personal, social and professional. A student must have a fair knowledge of English language and skills to communicate effectively to handle the future jobs in industry. The objective of this course is to enable the diploma holders to acquire proficiency, both in spoken (oral) and written language. At the end of the course, the student will be able to develop comprehension skills, improve vocabulary, use proper grammar, acquire writing skills, correspond with others and enhance skills in spoken English. It is expected that each polytechnic will establish a **communication skill laboratory** for conducting practicals mentioned in the curriculum.

UNIT-1
Facets of Literature-I (Short Stories & Poems)
Short Stories:
1. The Portrait of a Lady - Khushwant Singh
2. The Refugees – Pearl S. Buck
Poems:
1. All The World's A Stage – W. Shakespeare
2. Say Not, The Struggle Nought Availeth – A.H. Clough

UNIT-1I
Facets of Literature-II (Prose)
1. Walking Tours – R.L. Stevenson
2. A Dialogue on Civilization – C.E.M. Joad
3. The Sign of Red Cross – Horace Shipp

UNIT-III
Grammar and Usage
Narration
Voice
Idioms and Phrases

UNIT-IV
Correspondence & Drafting
Correspondence: Personal letters

Drafting: Report Writing, Memos, Circulars and Notes, Telegrams, Agenda and Applying for a Job.

UNIT-V

Communication

Media and Modes of Communication, Channels of Communication, Barriers to Communication, Listening Skills, Body language.

Course Outcome:

CO 1: To have practical exposure to the basic language techniques in professional
CO 2: Comprehend given passage and summarize them.
CO 3: Draft official letters.
CO 4: Apply correct voice and prepositions in formal communication.
CO 5: Make sentence using connector for desire meaning.

REFRENCES

1. English and Communication Skills, Book-II By Kuldip Jaidka, Alwainder Dhillon and Parmod Kumar Singla, Prescribed by NITTTR, Chandigarh & Published By Abhishek Publication, 57-59, Sector-17, Chandigarh
2. Essentials of Business Communication by Pal and Rorualling; Sultan Chand and Sons
3. The Essence of Effective Communication, Ludlow and Panthon; Prentice Hall of India
4. New Design English Grammar, Reading and Writing Skills by AL Kohli (Course A and course B), Kohli Publishers, 34 Industrial Area Phase-II, Chandigarh,
5. New Design English Reading and Advanced Writing Skills for Class XI and XII by MK Kohli and AL Kohli; Kohli Publishers, 34 Industrial Area Phase-II, Chandigarh,
6. A Practical English Grammar by Thomson and Marlinet
7. Spoken English by V Sasikumar and PV Dhamija; Tata McGraw Hill
8. English Conversation Practice by Grount Taylor; Tata McGraw Hill
9. Developing Communication Skills by Krishna Mohan and Meera Banerji; MacMillan India Ltd., Delhi
10. Business Correspondence and Report Writing by RC Sharma and Krishna Mohan; Tata McGraw Hill Publishing Company Ltd. New Delhi
11. Communication Skills by Ms R Datta Roy and KK Dhir; Vishal Publication, Jalandhar

NOTE FOR PAPER SETTER: The question paper shall comprise of 80 marks. Two questions will be set from each unit. The student has to attempt five questions, at least one from each unit.

Department of Electronics & Communication Engineering
SEMESTER-II

Course Title: Applied Mathematics-II
Course Code: CE/ERE/ME/ECE - 202
L T P
4 0 0

Max. Marks: 100
External: 60
Internal Assessment: 20
Duration of Exam: 3 Hrs

Objective:
Applied mathematics forms the backbone of engineering students. Basic elements of Differential calculus and integral calculus and statistics have been included in this course. This will develop analytical abilities to apply in engineering field and will provide continuing educational base to the students.

UNIT-1
Differential Calculus-I
Definition of function; Concept of limits.

Four standard limits $\lim_{x \to a} \frac{x^n - a^n}{x - a}$, $\lim_{x \to 0} \frac{\sin x}{x}$, $\lim_{x \to 0} \frac{a^x - 1}{x}$, $\lim_{x \to 0} (1+x)^{1/x}$

Differentiation by definition of x^n, sin x, cos x, tan x, e^x, $\log_a x$ only.
Differentiation of sum, product and quotient of functions. Differentiation of function of a function.

UNIT-1I
Differential Calculus-II
Differentiation of trigonometric inverse functions. Logarithmic differentiation.
Exponential differentiation Successive differentiation (excluding nth order).
Applications:
(a) Maxima and minima
(b) Equation of tangent and normal to a curve (for explicit functions only).

UNIT-III
Integral Calculus-I
Integration as inverse operation of differentiation.
Simple integration by substitution, by parts & by partial fractions (for linear factors only)

UNIT-IV
Integral Calculus-II
Evaluation of definite integrals (simple problems)-
Evaluation of $\int_0^{\pi/2} \sin^n x.\, dx$, $\int_0^{\pi/2} \cos^n x\, dx$, $\int_0^{\pi/2} \sin^m x \cos^n x\, dx$

using formulae without proof (m and n being positive integers only)
Applications:

(a) Area bounded by simple curves and axes.
(b) Volume of a solid formed by revolution of an area about axes (simple problems).

UNIT-V

Statistics

Measures of Central Tendency: Mean, Median, Mode.
Measures of Dispersion: Mean deviation, Standard deviation.

Course Outcome:

CO1: Use mathematical tool to understand engineering principles and concepts.
CO2: Concept of Differential Calculus-I function; Concept of limits and Differential Calculus-II
CO3: Evaluate definite and indefinite integrals
CO4: Apply integration for finding area and volume.
CO5: Apply basic knowledge of statistics for sampling, data collection, standard deviation

RECOMMENDED BOOKS

1. Elementary Engineering Mathematics by BS Grewal, Khanna Publishers, New Delhi.
2. Engineering Mathematics by Vol. I & II by S Kohli, IPH, Jalandhar
3. Applied Mathematics by Dr. RD Sharma
4. Applied Mathematics, Vol. I & II by SS Sabharwal & Sunita Jain, Eagle Parkashan, Jalandhar
5. Comprehensive Mathematics, Vol. I & II by Laxmi Publications
6. Engineering Mathematics by Dass Gupta
7. Engineering Mathematics by C Dass Chawla, Asian Publishers, New Delhi
8. Comprehensive Mathematics, Vol. I & II by Laxmi Publications
9. Engineering Mathematics, Vol I, II & III by V Sundaram et.al, Vikas Publishing House (P) Ltd., New Delhi
10. Engineering Mathematics by N.Ch.S.N Iyengar et.al, Vikas Publishing House (P) Ltd., New Delhi
11. Engineering Mathematics, Vol I & II by SS Sastry, Prentice Hall of India Pvt. Ltd.,
12. Engineering Mathematics, Vol I & II by AK Gupta, Macmillan India Ltd., New Delhi

NOTE FOR PAPER SETTER: The question paper shall comprise of 80 marks. Two questions will be set from each unit. The student has to attempt five questions, at least one from each unit.

Department of Electronics & Communication Engineering
SEMESTER-II

Course Title: Applied Physics-II
Course Code: CE/ERE/ME/ECE - 203
L T P
4 0 0

Max. Marks: 100
External: 60
Internal Assessment: 20
Duration of Exam: 3 Hrs

Objective:

Applied physics includes the study of a large number of diverse topics related to things that go in the world around us. It aims to give an understanding of this world both by observation and prediction of the way in which objects behave. Concrete use of physical principles and analysis in various fields of engineering and technology

UNIT-1
Waves and Vibrations
Generation of waves by vibrating particles, Wave motion with examples, Types of wave motion, transverse and longitudinal wave motion with examples. Velocity, frequency and wave length of a wave (relationship $v = \eta\lambda$). Sound and Light waves.
Ultrasonics–production (Galton Whistle and piezoelectric detection) & their engineering applications

UNIT-1I
Principle of Optics
Introduction: reflection of light, image formation in mirrors (convex and concave), refraction and refractive index, image formation in lenses, lens formulae (thin lens only), power of lens, total internal reflection.
Defects in image formation by lenses and their correction.
Simple and compound microscope, astronomical and Galileo telescope, magnifying power and its calculation (in each case).
Overhead projector and slide projector

UNIT-III
Electrostatics
Coulombs law, unit charge and its SI units. Gauss's Law. Electric field intensity and electric potential, equipotential surfaces and their properties. Calculation of electric field of point charge, charged sphere (conducting and non-conducting), straight charged conductor, plane charged sheet.
Capacitance, types of capacitors, capacitance of parallel plate capacitor, series and parallel combination of capacitors. Dielectric and its effect on capacitors, dielectric constant and dielectric break down.

UNIT-IV
Electricity

Ohm's law, Resistance of a conductor, specific resistance, series and parallel combination of resistors, effect of temperature on resistance. Kirchoff's law and its applications, Wheatstone bridge principle. Heating effect of current and concept of electric power.

UNIT-V

Modern Physics

Lasers: concept of energy levels, ionizations and excitation potentials; spontaneous and stimulated emission; lasers and its characteristics, population inversion, types of lasers, helium – neon and ruby lasers, applications of lasers.

Fibre optics: Introduction, optical fiber materials, types, light propagation & applications.

Superconductivity: Phenomenon of super conductivity.

Energy sources–Conventional and non-conventional (wind, water, solar, bio, nuclear energy) (only elementary idea).

Course Outcome:

CO1:Identify general properties of Waves and Vibrations
Principle of Optics

CO2: Use and application of different measuring instruments.

CO3:Apply principles and concept of Modern Physics for solving various engineering problems.

CO4: Use the concept of Electrostatics ,Electricity

RECOMMENDED BOOKS

1. Applied Physics Vol. II, TTTI Publication Tata McGraw Hill, Delhi
2. Basic Applied Physics by RK Gaur; Dhanpat Rai Publications
3. Comprehensive Practical Physics-Volume I and II by JN Jaiswal; Laxmi Publishers
4. Numerical Problems in Physics-Volume I and II by RS Bharaj; Tata McGraw Hill
5. Simple Course in Electricity and Magnetism by CL Arora; S Chand and Co, New Delhi
6. Fundamental Physics-Volume I and II by Gomber and Gogia; Pardeep Publications, Jalandhar
7. A Text Book of Optics by Subramanian and Brij Lal
8. Physics Laboratory Manual by PK Palanisamy, Scitech Publications
9. Fundamentals of Physics by Resnick and Halliday, Asian Books Pvt. Ltd., New Delhi
10. Concepts in Physics by HC Verma; Bharti Bhawan Ltd., New Delhi

NOTE FOR PAPER SETTER: The question paper shall comprise of 80 marks. Two questions will be set from each unit. The student has to attempt five questions, at least one from each unit.

Department of Electronics & Communication Engineering
SEMESTER II

Course Title: Basic Electrical Engineering
Course Code: ERE - 204
L T P
4 0 0

Max. Marks: 100
External: 60
Internal Assessment: 40
Duration of Exam: 3 Hrs

Objective:

A diploma holder may be involved in various jobs ranging from preventive maintenance of electrical installation to fault location. In addition, he/she may be working in testing laboratories where he/she uses measuring instruments. To carry out these and similar jobs effectively, knowledge of basic concepts, principles and their applications is very essential. This course will enable the students to understand the basic concepts and principles of dc and ac fundamental, ac circuits, batteries, electromagnetic induction, voltage and current sources etc

UNIT I
Introduction to Electrical Engineering
Different forms of energy, Advantages of electrical energy, Difference between a.c & d.c
Uses of electrical energy.
Basic Electrical Quantities: Basic concept of charge, current, voltage, resistance, power, energy and their units, Conversion of units of work, power and energy from one form to another.
Advantages of 3 phase over single phase system. Introduction to Star and delta connections.

UNIT II
Batteries
Basic idea about primary and secondary cells. Working, principle, construction and applications of Lead acid battery and Nickel Cadmium cells. Silver Oxide Cells. Charging methods used for lead acid accumulator. Care and maintenance of lead acid battery. Grouping of cells in series and parallel (simple numerical problems).

UNIT III
DC Circuits
Ohm's law, resistances in series and parallel. Kirchhoff's laws and their applications in solving electrical network problems. Network theorems such as Thevenin's theorem, Superposition Theorem and Norton's theorem. Star-delta transformation. Introduction to current and voltage sources

UNIT IV
Electromagnetism and Electromagnetic Induction.
Electromagnetism: Introduction to electromagnetism, Magnetic field around a straight current carrying conductor and a solenoid and methods to find its direction, force between two parallel current carrying conductors. Force on a conductor placed in the magnetic field. Series magnetic circuits, simple problems. Concept of hysteresis, hysteresis loop and hysteresis loss.

Electromagnetic Induction: Faraday's Laws of electromagnetic induction. Lenz's law. Fleming's Right and Left Hand Rule. Principle of self and mutual induction. Principle of self and mutually induced e.m.f. and simple problems. Inductance in series and parallel. Energy stored in a magnetic field. Concept of eddy currents, eddy current loss.

UNIT V

AC Fundamentals

Concept of alternating current and voltage, equation of instantaneous values. Representation of alternating sinusoidal quantities by vectors. Phasor algebra (addition, subtraction, multiplication and division of complex quantities). AC through pure resistance, inductance and capacitance. Concept of susceptance, conductance and admittance. Alternating voltage applied to RL, RC and RLC series and parallel circuits (impedance triangle, phasor diagram and their solutions). Power in pure resistance, inductance, capacitance, RL, RC and RLC circuits. Active and reactive components of current and their significance. Power factor and its practical significance. Resonance in series and parallel circuits. j-notation and its application in solving problems in ac circuits.

Course Outcome:

CO1: Able to determine of B/H curve of a magnetic material.
CO2: Able to analyze AC series, parallel and balanced three phase circuits.
CO3: Able to determine Voltage regulation and efficiency of a single phase transformer by direct loading.
CO4: Able to control the Speed of a DC motor by varying: - a. field current with armature voltage kept constant b. armature voltage with field current kept constant.
CO5: Able to study the Reversal of direction of rotation of a three phase induction motor

REFERENCES

1. Electrical Technology, Fifth Edition by Edward Hughes, Longman Publishers
2. Basic Electrical and Electronics Engineering by SK Sahdev; Dhanpat Rai and Sons, New Delhi
3. Experiments in Basic Electrical Engineering by SK Bhattacharya, KM Rastogi; New Age International (P) Ltd.; Publishers New Delhi
4. Electrical Science by Choudhury S.; Narosa Publishing House Pvt Ltd, Darya ganj, New Delhi
5. Basic Electrical and Electronics Engineering by Kumar KM, Vikas Publishing House Pvt Ltd, Jang pura, New Delhi
6. Basic Electrical Science and Technology by Kumar KM, Vikas Publishing House Pvt Ltd, Jang pura, New Delhi

NOTE FOR PAPER SETTER: The question paper shall comprise of 60 marks. Two questions will be set from each unit. The student has to attempt five questions, at least one from each unit.

Department of Electronics & Communication Engineering
SEMESTER-II

Course Title: Basic Electronics
Course Code: ECE - 205
L T P
4 0 0

Max. Marks: 100
External: 60
Internal Assessment: 20
Duration of Exam: 3 Hrs

Objective:
This subject gives the knowledge of fundamental concepts and principles of basic electronics and aims at providing the students with basic understanding of various types of materials such as conductors, semiconductors and insulators, extrinsic and intrinsic semi-conductors, p-n junction, need of rectifiers. The teacher should give emphasis on understanding of concepts by explaining the various terms used in the subject. Practical exercises have been included in order to reinforce various concepts. Industrial/field exposure must be given by organizing industrial visit.

UNIT-I
Semiconductor Physics
Review of basic atomic structure and energy levels, concept of insulators, conductors and semi conductors, atomic structure of Germanium (Ge) and Silicon (Si), covalent bonds. Concept of intrinsic and extrinsic semi conductor, P and N impurities, doping of impurity.
P and N type semiconductors and their conductivity. Effect of temperature on conductivity of intrinsic semi conductor. Energy level diagram of conductors, insulators and semi conductors; minority and majority carriers.

UNIT-II
Semiconductor Diode
PN junction diode, mechanism of current flow in PN junction, Drift and diffusion current, depletion layer, forward and reverse biased PN junction, potential barrier, concept of junction capacitance in forward and reverse bias condition.
V-I characteristics, static and dynamic resistance and their calculation from diode characteristics. Diode as half wave, full wave and bridge rectifier. PIV, rectification efficiencies and ripple factor calculations, shunt capacitor filter, series inductor filter, LC filter and filter. Types of diodes, characteristics and applications of Zenor diodes. Zenor and avalanche breakdown.

UNIT-III
Introduction to Bipolar Transistor
Concept of bipolar transistor, structure, PNP and NPN transistor, their symbols and mechanism of current flow; Current relations in transistor; concept of leakage current. CB, CE, CC configuration of the transistor; Input and output characteristics in CB and CE configurations; input and output dynamic resistance in CB and CE configurations; Current amplification factors. Comparison of CB CE and CC Configurations.
Transistors as an amplifier in CE Configurations; d.c load line and calculation of current gain, voltage gain using d.c load line.

UNIT-IV

Transistor Biasing & Transistor Amplifier

Transistor Biasing Circuits: Concept of transistor biasing and selection of operating point. Need for stabilization of operating point. Different types of biasing circuits.

Single Stage Transistor Amplifier: Single stage transistor amplifier circuit, a.c load line and its use in calculation of currents and voltage gain of a single stage amplifier circuit. Explanation of phase reversal of output voltage with respect to input voltage. H- parameters and their significance. Calculation of current gain, voltage gain, input impedance and output impedance using h-parameter.

UNIT-V

Field Effect Transistors

Construction, operation and characteristics of FET and its application.

Construction, operation and characteristics of MOSFET in depletion and enhancement modes and its applications.

C MOS - advantages and applications. Comparison of JFET, MOSFET and BJT.

FET amplifier circuit and its working principle (No analysis).

Course Outcome:

CO1: Gain Knowledge of Electronic components such as Resistors, Capacitors, Diodes, Transistors measuring equipment like DC power supply, Multimeter, CRO, Signal generator, DC power supply.

CO2: Analyze the characteristics of Junction Diode, Zener Diode, BJT & FET and different types of Rectifier Circuits.

CO3: Determine the input-offset voltage, input bias current and Slew rate, Common-mode Rejection ratio, Bandwidth and Off-set null of OPAMPs.

CO4: Able to know the application of Diode, BJT & OPAMP

RECOMMENDED BOOKS

1. Basic Electronics and Linear Circuit by NN Bhargava and Kulshreshta, Tata McGrow Hill, New Delhi.
2. Principles of Electrical and Electronics Engineering by VK Mehta; S Chand and Co., New Delhi
3. Electronic Components and Materials by SM Dhir, Tata McGraw Hill, New Delhi
4. Electronics Devices and Circuits by Millman and Halkias; McGraw Hill. New Delhi
5. Principles of Electronics by Albert Paul Malvino; Tata McGraw Hill, New Delhi
6. Basic Electrical and Electronics Engineering by SK Sahdev; Dhanpat Rai and Sons, New Delhi

NOTE FOR PAPER SETTER: The question paper shall comprise of 80 marks. Two questions will be set from each unit. The student has to attempt five questions, at least one from each unit

Department of Electronics & Communication Engineering
SEMESTER-II

Course Title: **ENGLISH AND COMMUNICATION SKILLS – II** Lab
Course Code: ECE - 211
L T P
0 0 1

Max. Marks: 50
External: 25
Internal Assessment: 25

LIST OF PRACTICALS

1. Practice on browsing information from Internet and e-mail
2. Group Discussions
3. Mock Interviews
4. Telephone Etiquette – demonstration and practice
5. Situational Conversation with feedback through video recording
6. Presentation on a given theme (using PowerPoint)
7. Exercises leading to personality development like mannerism, etiquettes, body language etc.
8. Reading unseen passages
9. Writing (developing) a paragraph
10. Exercises on writing notices and telephonic messages.

Course Outcome:

CO 1: To have practical exposure to the basic language techniques in professional
CO 2: Comprehend given passage and summarize them.
CO 3: Draft official letters.
CO 4: Apply correct voice and prepositions in formal communication.
CO 5: Make sentence using connector for desire meaning.

Department of Electronics & Communication Engineering
SEMESTER-II

Course Title: **APPLIED PHYSICS – II** Lab
Course Code: ECE - 212
L T P
0 0 1

Max. Marks: 50
External: 25
Internal Assessment: 25

LIST OF PRACTICALS (To perform minimum eight experiments)

1. To find the focal length of convex lens by displacement method.
2. To determine the magnifying power of an astronomical telescope
3. Conversion of Galvanometer into an Ammeter of given range.
4. Conversion of Galvanometer into Voltmeter of given range.
5. To verify ohm's laws by drawing a graph between voltage and current.
6. To verify laws of resistances in series and in parallel connection.
7. To find resistance of galvanometer by half deflection method
8. To measure very low resistance and very high resistance using Wheat Stone bridge
9. To find the time constant of a capacitor
10. To draw characteristics of a pn junction diode and determine knee and break down voltages
11. To find wave length of He Ne semiconductor laser.

Course Outcome

CO1: Understand the basics concepts of Ohm's law.
CO2: Understand the connections of resisters in parallel and series.
CO3: Have a thorough knowledge of device like ammeter,galvanometer,voltmeters etc.
CO4: Perform the conversion of galvanometer in ammeter and voltmeter.
CO5: Understand the working of telescope and microscope.

INSTRUCTIONAL STATREGY

Teacher may use various instructional media like models, charts and graphs while imparting instructions. The field application should be made clear before teaching the basics of waves, sound, light, electrostatics, dc circuits, electromagnetism, and semiconductor physics etc to develop proper understanding of the physical phenomenon. Use of demonstration can make the subject interesting and develop scientific temper in the students

Department of Electronics & Communication Engineering
SEMESTER-II

Course Title: **BASIC ELECTRICAL ENGG** Lab
Course Code: ECE - 213
L T P
0 0 1

Max. Marks: 50
External: 25
Internal Assessment: 25

LIST OF PRACTICALS

1. Familiarization of measuring instruments viz voltmeter, ammeter, CRO, Wattmeter, multi-meter and other accessories
2. Determination of voltage-current relationship in a dc circuit under specific physical conditions and to draw conclusions.
3. Measurement of resistance of an ammeter and a voltmeter
4. Verification of dc circuits:
   a.. Thevenin's theorem,
   b. Norton's theorem,
5. Observation of change in resistance of a bulb in hot and cold conditions, using voltmeter and ammeter.
6. Verification of Kirchhoff's Current and Voltage Laws in a dc circuit
7. To find the ratio of inductance of a coil having air-core and iron-core respectively and to observe the effect of introduction of a magnetic core on coil inductance
8. Computation of the voltage current relationship in single phase R-L and R-C series circuits, drawing of their impedance triangles and determination of the power factor in each case .
9. Charging and testing of a lead - acid storage battery.
10. Measurement of power and power factor in a single phase R-.L-.C. circuit and calculation of active and reactive powers in the circuit.
11. Visit to a nearby Power Station(s) may be arranged.

Course Outcome:

CO1: Able to determine of B/H curve of a magnetic material.
CO2: Able to analyze AC series, parallel and balanced three phase circuits.
CO3: Able to determine Voltage regulation and efficiency of a single phase transformer by direct loading.
CO4: Able to control the Speed of a DC motor by varying: - a. field current with armature voltage kept constant b. armature voltage with field current kept constant.
CO5: Able to study the Reversal of direction of rotation of a three phase induction motor.

INSTRUCTIONAL STRATEGIES

Basic electrical engineering being a fundamental subject, it needs to be handled very carefully and in a manner such that students develop clear understanding of the related concepts and principles. The teacher may lay more emphasis on laboratory work and give home assignments to students to inculcate self-study and problem solving abilities amongst them.

Department of Electronics & Communication Engineering
SEMESTER-II

Course Title: **BASIC ELECTRONICS** Lab
Course Code: ECE - 214
L T P
0 0 1

Max. Marks: 50
External: 25
Internal Assessment: 25

LIST OF PRACTICALS

1. Identification and testing of electronic components such as resistor, inductor, capacitor, diode, transistor and different types of switches used in Electronic circuits

   Measurement of resistance, capacitance and Inductance using multimeter and comparison of resistance with colour code values

2. Familiarization with operation and use of the following instruments.

   Multi-meter, CRO, Signal generator, LCR meter, Regulated Power Supply by way of taking readings of relevant quantities with their help.

3. Plotting of V-I characteristics of a PN junction diode and to calculate its static and dynamic resistance
   Plotting of V-I characteristics of a Zener diode and finding its reverse breakdown voltage

4. Measurement of the voltage gain, input and output impedance in a single state CE amplifier circuit.

5. Fabrication of: (a) Half-wave rectifier circuit using one diode (b) Full-wave rectifier circuit using two diodes and (c) Bridge-rectifier circuit using four diodes

6. Observation of the wave shapes for the following rectifier circuit

   a) Half-wave rectifier
   b) Full-wave rectifier
   c) Bridge-rectifier

7. Plotting of the wave shape of full wave rectifier with

   a) Shunt capacitor filter
   b) Series inductor filter
   c) RC filter

8. Plotting of input and output characteristics and calculation of parameters of transistors in CE configuration.

9. Plotting of input and output characteristics and calculation of parameters of transistors in CB configuration.

10. Plotting of V-I characteristics of a FET based amplifier.

11. Measurement of the Q-point and observation of variation of Q-point by:

.

a) increasing the base resistance in fixed bias circuit.
b) changing out of bias resistance in potential divider circuit.

12. Measurement of voltage gain, input and output impedance and band width by plotting frequency response curve of a single stage amplifier using CE configuration at different loads.

13. Measurement of voltage gain of FET on an amplifier circuit

Course Outcome:

CO1: Gain Knowledge of Electronic components such as Resistors, Capacitors, Diodes, Transistors measuring equipment like DC power supply, Multimeter, CRO, Signal generator, DC power supply.
CO2: Analyze the characteristics of Junction Diode, Zener Diode, BJT & FET and different types of Rectifier Circuits.
CO3: Determine the input-offset voltage, input bias current and Slew rate, Common-mode Rejection ratio, Bandwidth and Off-set null of OPAMPs.
CO4: Able to know the application of Diode, BJT & OPAMP**.**

INSTRUCTIONAL STRATEGY

The aim of this subject is to provide the knowledge of the fundamental concepts related to basic electronics. The teacher should give more emphasis on understanding of concepts and the measuring of various terms used in the subject. The students be made familiar with diodes, transistors, resistors, capacitors, inductors etc. and various measuring instruments such as Multi-meter, CRO, Signal generator, LCR meter, Regulated Power Supply etc. Practical exercises should be included to reinforce the various concepts. Practical applications of semiconductor diodes, transistors, field effect transistors etc must be elucidated to the students.

Department of Electronics & Communication Engineering
SEMESTER-II

Course Title: General Workshop Practice-II
Course Code: CE/ERE/ME/ECE - 215
L T P
0 0 2

Max. Marks: 100
External: 50
Internal Assessment: 50

Objectives:

As we know that, the psychomotor skills are mastered through practice, an opportunity therefore, has been extended to students through this course to refine their skills in different trades. The basic skills developed during first semester will be refined during this course by doing higher order skills jobs. In addition to developing general manual and machining skills in the students, the objective of development of sense of dignity of labour, precision, safety at work places, team working and right attitude among the students will also be met.

LIST OF PRACTICALS

1. Carpentry and Painting Shop-II

Introduction to joints, their relative advantages and uses.

Job I Preparation of Dovetail joint and glued joint.
Job II Preparation of Mitre Joint
Job III Preparation of a lengthening Joint
Job 1V Preparation of at least one utility job with and without lamination.

Demonstration of job showing use of Rip Saw, Bow saw and Tramme, method of sharpening various saws.

Demonstration of job on Band Saw and circular saw, chain and diesel universal wood working machine, saw resharpening machine, Saw Brazing unit.

Demonstration of various methods of painting wooden items.

Job V Preparation of surface before painting.
Job VI Application of primer coat
Job VII Painting wooden items by brush/roller/spray

2. Fitting and Plumbing Shop-II

Description and demonstration of various types of drills, taps and dies

Selection of dies for tapping. Types of taps, tapping, dieing and drilling operations.

Job I Making internal and external threads on a job by tapping and dieing operations (manually)

Precautions while drilling soft metals, specially aluminum and lead.

Job II Drilling practice on soft metals (Aluminum, Brass and lead)

Care and maintenance of measuring tools like calipers, steel rule, try square, vernier, micrometer, height gauge, combination set, reading gauge. Handling of measuring instruments, checking of zero error, finding of least count.

Job III Preparation of a job by filing on non- ferrous metal.

Job IV Production of a utility job involving all the above operations.

Job V Preparation of job involving thread on GI pipe/ PVC pipe and fixing of different types of elbow T - Union, socket, stopcock, taps, etc

Description and demonstration of various types of drills, taps and dies; Selection of dies for tapping; Types of taps, Tapping and dieing operations.

3. Welding Shop-II

Introduction of the gas welding, gas welding equipment, adjustments of different types of flames, demonstration and precautions about handling welding equipment.

Job I Practice in handling gas welding equipment and welding practice.

Common welding joints generally made by gas welding.

Job II Preparation Butt joint by gas welding.

Job III Preparation of small cot conduit pipe frame by electric arc welding/gas welding.

Job IV Preparation of square pyramid from M.S rods by welding (type of welding to be decided by students themselves).

Job V Exercise job on spot/seam welding machine.

Demonstration of various methods adopted for painting steel items.

Job VI Painting steel items by brush/roller/ spray

4. Sheet metal & Machine shop

Introduction to sheet metal process and tools

Job I Making sheet metal joints

Job II Making sheet metal trey or a funnel or a computer chassis

Job III Preparation of sheet metal jobs involving rolling, shearing, creasing, bending and cornering

Job IV Prepare a lap riveting joint of sheet metal pieces

Introduction to various machines used in machine shop.

Job V Exercise on simple turning

Job VI Exercise on taper turning

Job VII Marking and drilling practice on mild steel piece

Job VIII Marking and drilling practice on aluminium piece

Job IX Demonstration of various functions of CNC Machine

5. Electric Shop-II

Importance of three phase wiring and its effectiveness.

Job I Laying out 3 phase wiring for an electric motor or any other 3 phase machine.

Estimating and costing power consumption.

Job II Connecting single phase energy meter and testing it. Reading and working out the power consumption and the cost of energy.

Job III Checking continuity of connection (with tester and bulbs), location of faults with a multimeter and their rectification in simple machines and/or other electric circuits fitted with earthing.

Demonstration of dismantling, servicing and reassembling of a table fan/ceiling fan/air cooler/mixer/electric iron, Electric heater, geaser, electric oven etc.

Job IV Dismantling, serving and reassembling of any of the above electrical appliances.

Job V Demonstration of testing single phase/three phase electrical motor by using voltmeters ammeter clip on meter technometer etc.

Job VI Reversing the rotation of motor.

Course Outcome:

CO1: Able to make the connections of house wiring

CO2: Able to make small transformers.

CO3:Able to repair transformers, fan, motor etc

RECOMMEND BOOKS

1. Manual on Workshop Practice by K Venkata Reddy, KL Narayana and P Kaunaioh; MacMillan India Ltd., New Delhi
2. Basic Workshop Practice Manual by T Jeyapoovan; Vikas Publishing House (P) Ltd., New Delhi

Note:

The students are supposed to come in proper workshop dress prescribed by the institute. Wearing shoes in the workshop(s) is compulsory. Importance of safety and cleanliness, safety measures and upkeep of tools, equipment and environment in each of the following shops should be explained and practiced. The students should prepare sketches of various tools/jobs in their practical Notebook.

SEMESTER-II

Course Title: Student Centred Activities
Course Code: EE-117
L T P
0 0 4

Max. Marks: 50
Internal Assessment: 50

SCA will comprise of co-curricular activities like extension lectures, library studies, games, hobby clubs e.g. photography, painting, singing, seminars, declamation contests, educational field visits, N.C.C., NSS, Cultural Activities, Civil Defence/ Disaster Management activities etc.

Department of Electronics & Communication Engineering
SEMESTER-III

Course Title: Electronic Instrument and Measurements	Max.Marks:100
Course Code: ECE-301	External: 60
L T P	Internal Assessments: 40
4 0 0	Duration of exam: 3 Hrs

Objective:

In the real world of work the technician is required to handle wide variety of instruments while testing, trouble shooting, calibration etc. the study of this subject will help students to gain the knowledge of working principles and operation of different instruments. During practical sessions, he will acquire the requisite skills.

UNIT-I

Different types of meters

Introduction, Types of instruments, construction, Multi-range ammeters and voltmeters, Effects of Temp. Changes in ammeter and voltmeter, Errors**,** Ohm meter**:** Definition, series type ohmmeter, Shunt type ohmmeter, Multimeter**:** Electronic multimeter, its block diagram, advantage over conventional multimeter.

Principles of measurement of direct current and voltage, alternating voltage and current (moving cont and moving iron type instruments) Limitations with regards to frequency and Impedance.

UNIT-II

Cathode Ray Oscilloscope

Construction and working of different blocks used in CRT, Time base operation and need for blanking during fly back, 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

Digital storage oscilloscope: block diagram and working principle

UNIT-III

Signal Generators and Analysis Instruments

Explanation of block diagram specifications of low frequency and RF generators, pulse generator, function generator

Distortion factor meter; wave analyzer and spectrum analyzer

UNIT-IV

Impedance Bridges and Q Meters

Wheat stone bridge, AC bridges: Maxwell's induction bridge, Hay's bridge, De-Sauty'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

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, working principle of logic probe, logic pulser, logic analyzer, logic comparator, signature analyzer and logic analyzer

Course Outcome:

CO1: Study Ohm's law and Kirchoff's Laws
CO2: Explain the circuit theorems
CO3: Understand the different RLC series and parallel circuits
CO4: Study the series and parallel resonance circuits
CO5: Study the basic measuring instruments
CO6: Draw the block diagram of CRO

RECOMMENDED BOOKS

1. Electronics Measurement and Instrumentation by AK Sawhney, Dhanpat Rai & Co. Delhi
2. Electronics Instrumentation by Cooper, Prentice Hall of India, New Delhi
3. Electronics Test and Instrumentation by Rajiv Sapra, Ishan Publications, Ambala
4. Electronics Instrumentation by JB Gupta, Satya Prakashan, New Delhi

NOTE FOR PAPER SETTER: The question paper shall comprise of 80 marks. Two questions will be set from each unit; the student has to attempt five questions, at least one from each unit.

Department of Electronics & Communication Engineering
SEMESTER-III

Course Title: Principles of Communication Engineering	Max.Marks:100
Course Code: ECE-302	External: 60
L T P	Internal Assessments: 40
4 0 0	Duration of exam: 3 Hrs

Objective:
The study of principles of communication systems leads to further specialized study of audio and video systems, line communications and microwave communication systems. Thus the diploma-holder in Electronics and Communication Engineering shall find employment in areas of R and D, production, servicing and maintenance of various communication systems. The students should understand the advantage and limitations of various analog and digital modulation systems on a comparative a scale and relate to them while studying practical communication systems.

UNIT-I
Introduction
Need for modulation frequency translation and demodulation in communication systems, Basic scheme of a modern communication system.
Amplitude modulation: Derivation of expression for an amplitude modulated wave. Carrier and side band components. Modulation index. Spectrum and BW of AM Wave. 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

UNIT-II
Frequency modulation
Expression for frequency modulated wave and its frequency spectrum (without Proof and analysis of Bessel function) Modulation index, maximum frequency deviation and deviation ratio, BW and FM signals, Carson's rule. Effect of noise on FM carrier. Noise triangle, Role of limiter, 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.

UNIT-III
Principles of Modulators
Working principles and typical application as: Square Law Modulator-Switching Modulator-Collector modulator-Base Modulator-Balanced Modulator- Ring Modulator
Principles of FM Modulators: Working principles and applications of reactance modulator, varactor diode modulator, VCO and Armstrong phase modulator. Stabilization of carrier for using AFC Block diagram approach).

UNIT-IV

Demodulation of AM Waves

Principles of demodulation of AM wave using diode detector circuit; concept of Clipping and formula for RC time constant for minimum distortion (no derivation), Principle of demodulation of AM Wave using synchronous detection.Demodulation of FM Waves: Basic principles of FM detection using slope detector, Principle of working of the following FM demodulators: Foster-Seeley discriminator-Ratio detector -Quadrature detector-Phase locked Loop (PLL). FM demodulators

UNIT-V

AM/FM Transmitters

Classification of transmitters on the basis of modulation, service, frequency and power, Block diagram of AM transmitters and working of each modulation, service, stage, Block diagram and working principles of reactance FET and Armstrong FM transmitters.

AM/FM Radio Receivers: Principle and working with block diagram of super heterodyne of AM receiver. Function of each block and typical waveforms at input and output of each block, Performance characteristics of a radio receiver sensitivity, selectivity, fidelity S/N ratio, image rejection ratio and their measurement procedure. ISI standards on radio receivers (brief Idea), Selection criteria for intermediate frequency (IF). Concepts of simple and delayed AGC, Block diagram of an FM receiver, function of each block and waveforms at input and output of different blocks. Need for limiting and de-emphasis in FM reception. Block diagram of communication receivers, differences with respect to broadcast receivers.

Course Outcome:

CO1: Understand the concept of modulation
CO2: study amplitude modulation process
CO3: learn about different types of AM Transmitter and Receiver:
CO4: study the Frequency modulation process:
CO5: learn about different types of FM Transmitter and Receiver:
CO6: Understand the concept of Phase modulation

RECOMMENDED BOOKS

1. Electronics Communication by Kennedy, Tata McGraw Hill, New Delhi
1. Electronics Communication by KS Jamwal, Dhanpat Rai & Sons, New Delhi
2. Radio Engineering by GK Mittal, Khanna Publishers, New Delhi
3. Principles of Communication Engineering by DR Arora, Ishan Publications, Ambala
4. Communication Engineering by A Kumar
5. Principles of Communication Engineering by Manoj Kumar, Satya Prakashan, New Delhi
6. Principles of Communication Engineering by Anokh Singh, S.Chand & Co., New Delhi
7. Principles of Communication Engineering by Roody , Coolin

NOTE FOR PAPER SETTER: The question paper shall comprise of 80 marks. Two questions will be set from each unit; the student has to attempt five questions, at least one from each unit.

Department of Electronics & Communication Engineering
SEMESTER-III

Course Title: Digital Electronics
Course Code: ECE-303
L T P
4 0 0

Max.Marks:100
External: 60
Internal Assessments: 40
Duration of exam: 3 Hrs

Objective:

This syllabus has been designed to make the students know about the fundamental principles of digital electronics and gain familiarity with the available IC chips. This subject aims to give a background in the broad field of digital systems design and microprocessors.

UNIT-I

Introduction of Number System & Codes

Distinction between analog and digital signal. Applications and advantages of digital signals. Need and process of A/D and D/A conversion, Binary and hexadecimal number system: conversion from decimal and hexadecimal to binary and vice- versa. Binary addition, subtraction, multiplication and division including binary points. 1's and 2's complement method of addition/subtraction, sign magnitude method of representation, floating point representation, Concept of code, weighted and non-weighted codes, examples of 8421, BCD, excess-3 and Gray code. Concept of parity, single and double parity and error detection Alpha numeric codes: ASCII and EBCDIC.

UNIT-II

Logic Gates and Simplification

Concept of negative and positive logic, Definition, symbols and truth tables of NOT, AND, OR, NAND, NOR, EXOR Gates, NAND and NOR as universal gates.

Postulates of Boolean algebra, DE Morgan's Theorems. Various identities. Formulation of truth table and Boolean equation for simple problem. Implementation of Boolean (logic) equation with gates, Karnaugh map (upto 4 variables) and simple application in developing combinational logic circuits Logic Families: Logic family classification: Definition of SSI, MSI, LSI, VLSI- TTL and C MOS families and their sub classification- Characteristics of TTL and C MOS digital gates. Delay, speed, noise margin, logic levels, power dissipation, fan-in, power supply requirement and comparison between TTL and C MOS families

Logic Circuits:-Open collector, wired OR and totem pole output circuit operation (qualitative) for a TTL NAND gate- C MOS circuit operation for a standard gate (NOR)

UNIT-III

Arithmetic Circuits, Coders and Decoders

Half adder and Full adder circuit, design and implementation. Half and Full subtracter circuit, design and implementation.4 bit adder/subtracter.Adder and Subtract or IC (7484)

Encoders and Decoders: Four bit decoder circuits for 7 segment display and decoder/driver ICs.Multiplexers and De-Multiplexers Basic functions and block diagram of MUX and DEMUX. Different types and ICs

UNIT-IV

Latches and flip flops and Counters

Concept and types of latch with their working and applications, Operation using waveforms and truth tables of RS, T, D, JK, and Master/Slave JK flip flops. Difference between a latch and a flip flop, IC flip flops

Counters: Binary counters, Divide by N ripple counters (including design), Decade counter. Pre settable and programmable counters, Down counter, up/down counter, Synchronous counters(only introduction). Difference between Asynchronous and Synchronous counters, Ring counter with timing diagram, Counter ICs

UNIT-V

Shift Register and Memories

Introduction and basic concepts including shift left and shift right. Serial in parallel out, serial in serial out, parallel in serial out, parallel in parallel out. Universal shift register, Buffer register, Tristate Buffer register

IC 7495. Memories: Basic RAM cell, N × M bit RAM, Expansion of word length and capacity, static and dynamic RAM, basic idea of ROM, PROM, EPROM and EEPROM.

Course Outcome:

CO1: Able to understand number systems conversions and Boolean algebra and design logic circuits using logic gates to their simplest forms using DeMorgan's Theorems; Karnaugh Maps.

CO2: Able to design & analyze combinational circuits and logic circuits with Programmable Logic Devices.

CO3: Able to design and analyze of various synchronous and asynchronous sequential circuits using State Diagrams & Tables.

CO4: Able to understand Digital To Analog Conversion, Analog To Digital Conversion technique and corresponding circuits.

CO5: Able to Analyze logic family interfaces, switching circuits & memory storage devices to Plan and execute projects**.**

RECOMMENDED BOOKS

1. Digital Electronics and Applications by Malvino Leach, Tata McGral Hill, New Delhi
1. Digital Logic Designs by Morris Mano, Prentice Hall of India, New Delhi
2. Digital Fundamentals by Thomas Floyds, Universal Book Stall
3. Digital Electronics by RP Jain, Tata McGraw Hill, New Delhi
4. Digital Electronics by KS Jamwal, Dhanpat Rai and Co., New Delhi
5. Digital Electronics by Rajiv Sapra, Ishan Publication, Ambala
6. Digital Electronics by BR Gupta, Dhanpat Rai & Co., New Delhi

7. Digital Systems: Principles and Applications by RJ Tocci, Prentice Hall of India, New Delhi
8. Digital Electronics by Rajaraman V., Prentice Hall of India, New Delhi
9. Fundamentals of Digital Electronics by Naresh Gupta, Jain Brothers, New Delhi

NOTE FOR PAPER SETTER: The question paper shall comprise of 80 marks. Two questions will be set from each unit; the student has to attempt five questions, at least one from each unit.

Department of Electronics & Communication Engineering
SEMESTER-III

Course Title: Electronic Devices And Circuits	Max.Marks: 100
Course Code: ECE-304	External: 60
L T P	Internal Assessments: 40
4 0 0	Duration of exam: 3 Hrs

Objective:

Having attained basic knowledge of electronic devices like diodes, transistors, and elementary circuits, in second semester, this course will enable the students to learn about the use of transistors in analog circuits like power amplifier, multistage amplifier, oscillators, wave shaping circuits and in multivibrators etc. It also gives information about timer, operational amplifier, voltage regulator, ICs and their applications for effective functioning in the field of electronic service industry.

UNIT-I
Multistage Amplifiers
Need for multistage amplifier, Gain of multistage amplifier, Different types of multistage amplifier like RC coupled, transformer coupled, direct coupled, and their frequency response and bandwidth.

UNIT-II
Large Signal Amplifier
Difference between voltage and power amplifiers, Importance of impedance matching in amplifiers, Class A, Class B, Class AB, and Class C amplifiers, collector efficiency and Distortion in class A,B,C,Single ended power amplifiers, Graphical method of calculation (without derivation) of output power; heat dissipation curve and importance of heat sinks. Push-pull amplifier and complementary symmetry push-pull amplifier.

UNIT-III
Feedback in Amplifiers
Basic principles and types of feedback, Derivation of expression for gain of an amplifier employing feedback,Effect of feedback (negative) on gain, stability, distortion and bandwidth of an amplifier,RC coupled amplifier without emitter bypass capacitor, Emitter follower amplifier and its applications

UNIT-IV
Sinusoidal Oscillators
Use of positive feedback, Barkhausen criterion for oscillations,Different oscillator circuits-
tuned collector, Hartley, Colpitts, phase shift, Wien's bridge, and crystal oscillator.
Their working principles (no mathematical derivation but only simple numerical problems)
Tuned Voltage Amplifiers, Series and parallel resonant circuits and bandwidth of resonant circuits, Single and double tuned voltage amplifiers and their frequency response characteristics

UNIT-V

Wave Shaping and Multivibrator Circuits

General idea about different wave shapers, RC and RL integrating and differentiating circuits with their applications, Diode clipping and clamping circuits and simple numerical problems on these circuits.

Multivibrator Circuits: Working principle of transistor as switch, Concept of multi-vibrator: astable, monostable, and bistable and their applications, Block diagram of IC 555 its working and applications.

Opto Electric Devices**:** Working principles and characteristics of photo resistors, photo diodes, photo transistors, LED, LCD and Opto couplers.

Course Outcome:

CO1: VI Characteristics of PN JN Diode
CO2: VI Characteristics of Zener diode.
CO3: HW, FW with and without filter.
CO4: Bridge Rectifier with and without filters.
CO5: VI characteristics of Regulator.
CO6: Input/output characteristics of CE Transistor.

RECOMMENDED BOOKS

1. Basic Electronics and Linear Circuits by NN Bhargava et. al., Tata McGraw Hills, New Delhi
2. Electronics Principles by Malvino, Tata McGraw Hills, New Delhi
3. Electronic Devices and Circuits by Millman and Halkias, McGraw Hills, New Delhi
4. Basic Electronics by Grob, Tata McGraw Hills, New Delhi
5. Art of Electronics by Horowitz
6. Electronic Principles by SK Sahdev, Dhanpat Rai and Co, New Delhi.
7. Electronic Circuit Theory by Boylstead
8. Electronic Devices and Circuits by BL Theraja, S Chand and Co Ltd. New Delhi
9. Operational Amplifiers and Linear Integrated Circuits by Ramakant A. Gaykwad
10. Electronics Devices and Circuits by Rama Reddy, Narosa Publishing House Pvt. Ltd., New Delhi
11. Electronics Devices and Circuits-II by Naresh Gupta, Jyoteesh Malhotra and Harish C. Saini, Eagle Prakashan, Jalandhar

NOTE FOR PAPER SETTER: The question paper shall comprise of 80 marks. Two questions will be set from each unit; the student has to attempt five questions, at least one from each unit.

Department of Electronics & Communication Engineering
SEMESTER-III

Course Title: Computer Programming and Application
Course Code: DECE-305
L T P
4 0 0

Max.Marks: 100
External: 60
Internal Assessments: 40
Duration of exam: 3 Hrs

Objective

Computer plays a very vital role in present day life, more so, in the professional life of Diploma engineers. In order to enable the students use the computers effectively in problem solving, this course offers the modern programming language C along with exposure to various engineering applications of computers. The knowledge of C language will be reinforced by the practical exercises and demonstration of application software in the field of Electrical Engineering during the course of study. Introduction to data base management system is also a very significant field with vast employment potential.

UNIT-I
Information Storage and Retrieval
Need for information storage and retrieval, Creating data base file, Querying database file on single and multiple keys, ordering the data on a selected key, Programming a very simple application

UNIT-II
Programming in C
Basic structure of C programs**.** Executing a C program**,** Constants, variables, and data types**,** Operators and expressions**,** Managing Input-Output operations like reading a character, writing a character, formatted input, formatted output through print, scan, getch, putch statements etc.

UNIT-III
Decision making
Decision making and branching using IF..... Else, switch, go to statements, Decision making and looping using do-while, and for statements, Arrays - one dimensional and two dimensional, Functions, Concept of pointers, structures and Files

UNIT-IV
Computers Application Overview
Commercial and business data processing application, Engineering computation, CAD, CAM, CAE, CAI

UNIT-V
Typical Applications:
Use of various application software available in the field of Electronics Engineering

Course Outcome:

CO1: Able to develop algorithms for mathematical and scientific problems.
CO2: Able to understand the components of computing systems.
CO3: Able to choose data types and structures to solve mathematical and scientific problem.
CO4: Able to develop modular programs using control structures.
CO5:Able to write programs to solve real world problems using object oriented features**RECOMMENDED BOOKS**

1. Programming in C by Balaguru Swamy, Tata McGraw Hill, New Delhi
2. Computer programming and applications by Chandershekhar, Unique International Publications, Jalandhar
3. Programming in C by Schaum Series, McGraw Hills
4. The essentials of Computer Organizing and Architecture by Linda Null and Julia Labur, Narosa Publishing House Pvt. Ltd., New Delhi
5. Programming in C by Kerning Lan and Riechie Prentice Hall of India, New Delhi
6. Let us C – Yashwant Kanetkar, BPB Publications, New Delhi
7. Vijay Mukhi Series for C and C++
8. Elements of C by MH Lewin, Khanna Publishers, New Delhi
9. Programming in C by R Subburaj, Vikas Publishing House Pvt. Ltd., Jangpura, New Delhi
10. Programming in C by Kris A Jansa, Galgotia Publications Pvt. Ltd., Daryaganj, New Delhi
11. Programming in C by BP Mahapatra, Khanna Publishers, New Delhi

NOTE FOR PAPER SETTER: The question paper shall comprise of 80 marks. Two questions will be set from each unit; the student has to attempt five questions, at least one from each unit.

Department of Electronics & Communication Engineering
SEMESTER-III

Course Title: Electronic Instrument and measurements -lab	Max.Marks: 100
Course Code: ECE-311	External: 50
L T P	Internal Assessments: 50
0 0 2	Duration of exam: 3 Hrs

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 was using Digital storage oscilloscope (DSO).
7. Measurement of resistance and inductance of coil using RLC meter
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
11. Study of operation and features of a logic analyser and signature analyser

Course Outcome:

CO1: Able to measure the voltage, Current etc
CO2: Able to work on CRO, Function generator etc
CO3: Able to work on instruments.

Department of Electronics & Communication Engineering
SEMESTER-III

Course Title: Principles of Communication Engineering -lab
Course Code: ECE-312
L T P
0 0 2

Max.Marks:50
External: 25
Internal Assessments: 25
Duration of exam: 3Hrs

LIST OF PRACTICALS

1. a) To observe an AM wave on CRO produced by a standard signal generator using internal and external modulation
   b) To measure the modulation index of the wave obtained in above practical
2. a) To obtain an AM wave from a modulator circuit and observe waveforms
   b) To generate a DSB-SC signal and observe the pattern on CRO for different levels of modulating signal
3. To obtain an FM wave from FM Modulator Circuit and measure the frequency deviation for different modulating signals.
4. To obtain modulating signal from an AM detector circuit and observe the pattern for different RC time constants and obtain its optimum value for least distortion.
5. To obtain modulating signal from a FM detector (Foster Seely / Ratio detector/ Quadrature) circuit and plot the discriminator characteristics.
6. To plot the sensitivity characteristics of a radio receiver and determination of the frequency for maximum sensitivity
7. To plot the selectivity characteristics of a radio receiver
8. To plot the fidelity characteristics of a radio receiver
9. To align AM broadcast radio receiver

Course Outcome:

CO1: Able to modulate the signal
CO2: Able to Generate the sinusoidal signal.
CO3: Able to generate the modulated signal.

Department of Electronics & Communication Engineering
SEMESTER-III

Course Title: Digital Electronics-Lab
Course Code: ECE-313
L T P
0 0 3

Max.Marks:150
External: 75
Internal Assessments: 75
Duration of exam: 3 Hrs

LIST OF PRACTICALS

1. Verification and interpretation of truth tables for AND, OR, NOT, NAND, NOR and Exclusive OR (EXOR) gates.
2. Realization of logic functions with the help of NAND or NOR gates.
   Construction of a NOR gate latch and verification of its operation
3. Construction of half adder using XOR and NAND gates and verification of its operation. Construction of a full adder circuit using XOR and NAND gates and verify its operation
4. 4 bit adder, 2's complement subtractor circuit using an 4 bit adder IC and an XOR IC and verify the operation of the circuit.
5. Construction of Nor Gate Latch and verification of its operation
6. Verification of truth table for positive edge triggered, negative edge triggered, level triggered IC flip-flops (At least one IC each of D latch , D flip-flop, edge triggered JK and master slave JK flip-flops).
7. Verification of truth table for encoder and decoder ICs, Mux and DeMux
   Construction of a 4 bit SISO, SIPO, PISO, PIPO shift registers using JK/D flip flops and Verification of their operation.
9. Construction and testing of a 4 bit ring counter.
10. Verification of truth table for any one universal shift register IC,Use of IC 7490 or equivalent, TTL (a) divide by2 (b) divide by 10 Counter

    (OR)

    Use of IC 7493 or equivalent TTL (a) divide by 2 (b) divide by 8 (c) divide by 16 counter.

Course outcome:

CO1: Able to understand the fundamental concepts and techniques used in digital electronics.

CO2: Able to understand and examine the structure of various number systems, De-Morgan's law, Boolean algebra and its application in digital design.
CO3: Able to understand, analyse the timing properties (input setup and hold times, minimum clock period, output propagation delays) and design various combinational and sequential circuits using various metrics: switching speed, throughput/latency, gate count and area, energy dissipation and power.
CO4: Able to understand different digital circuits using Programmable Logic Devices.
CO5: Able to know how to interface digital circuits with ADC & DAC.

Department of Electronics & Communication Engineering
SEMESTER-III

Course Title: Electronic Devices And Circuits-lab	Max.Marks:50
Course Code: ECE-314	External: 25
L T P	Internal Assessments: 25
0 0 2	Duration of exam: 3 Hrs

LIST OF PRACTICALS

1. Plot the frequency response of two stages RC coupled amplifier and calculate the bandwidth and compare it with single stage amplifier
2. To measure the gain of single ended power amplifier.
3. To measure the gain of push-pull amplifier.
4. To measure the voltage gains of RC Coupled amplifier with and without bypass capacitor.
5. To measure the voltage gain of emitter follower circuit and plot its frequency response
6. To observe and measure frequency of Hartley / Colpitts Oscillator on oscilloscope.
7. To observe and measure frequency of phase shift and we in bridge Oscillator on oscilloscope.
8. To plot the frequency response curve of a tuned voltage amplifier.
9. To observe the output waveforms of series and shunt clipping circuits
10. To observe the output for clamping circuits
11. To observe the output waveform of a astable/Monostable/Bistable multivibrator

Course Outcome:

CO1: VI Characteristics of PN JN Diode
CO2: VI Characteristics of Zener diode.
CO3: HW, FW with and without filter.
CO4: Bridge Rectifier with and without filters.
CO5: VI characteristics of Regulator.
CO6: Input/output characteristics of CE Transistor

Department of Electronics & Communication Engineering
SEMESTER-III

Course Title: Computer Programming and Application -Lab
Course Code: DECE-315
L T P
0 0 3

Max.Marks: 150
External: 75
Internal Assessments: 75
Duration of exam: 3 Hrs

LIST OF PRACTICALS

1. Creating database.
2. Querying the database.
3. Report generation.
4. Programming in dbase
5. Use of and electrical engineering related CAI packages.
6. Programming for DAS and control.
7. Exercises on data acquisition.
8. Exercises on control - on/off switch, and proportional control.
10. Programming exercise on executing C program 10. Programming exercise on editing C program
11. Programming exercise on defining variables and assigning values to variables.
12. Programming exercise on arithmetic and relational operators.
13. Programming exercise on arithmetic expressions and their evaluation.
14. Programming exercise on reading a character.
15. Programming exercise on writing a character.
16. Programming exercise on formatting input using print.
17. Programming exercise on formatting output using scan.
18. Programming exercise on simple if statement.
19. Programming exercise on IF .... else statement.
20. Programming exercise on switch statement.
21. Programming exercise on go to statement.
22. Programming exercise on do-while statement.
23. Programming exercise on for statement.
24. Programming exercise on one-dimensional arrays.
25. Programming exercise on two-dimensional arrays.
26. Exercises on Internet use/application, Typical application on Electronics and Communication Engineering

Course Outcome:

CO1: Able to know some basic commands of DOS, Windows and Linux Operating System, File handling and Directory structures, file permissions, creating and editing simple C program, compilation and execution of C program..

CO2: Able to write C Programs on variable, expression, operator and type-casting using Writing C Programs using different structures of if-else, switch-case, loop (for loop, while loop and do-while loop) and use of break and continue statement and functions.

CO3: Able to write C Programs demonstrating concept of Single & Multidimensional arrays, Function and Recursion, Pointers, address of operator, declaring pointers and operations on pointers, structures, union and pointer to structure, String and command line arguments, dynamic memory allocation and File Programming.

CO4: Able to implement modular programs using functions.

Department of Electronics & Communication Engineering
SEMESTER III

Course Title: Electronic Design and Fabrication Techniques Lab
Course Code: ECE-316

L	T	P
0	0	3

Max.Marks: 100
External: 50
Internal Assessments: 50
Duration of exam: 3 Hrs

LIST OF PRACTICALS

1. To study the procedure for making Printed Circuit Board.
2. To design the PCB layout of the circuit.
3. To draw the mirror image of the given circuit.
4. To draw the mirror image on the copper clad board.
5. To do the etching of the copper clad.
6. To drill the holes on copper clad board.
7. To solder the component on the PCB.

Course Outcome:

CO1: Able to make the circuit.
CO2: Able to make the layout of circuit.
CO3: Able to etching the PCB.
CO4: Able to mount the components on PCB
CO5: Able to solder the components.

Department of Electronics & Communication Engineering
SEMESTER-III

Course Title: ECOLOGY AND ENVIRONMENTAL AWARENESS CAMP	Max. Marks: 100
Course Code: ECE-316	External: 60
L T P	Internal Assessments: 40
4 0 0	Duration of exam: 3 Hrs

A diploma holder must have knowledge of different types of pollution caused due to industries and constructional activities so that he may help in balancing the eco system and controlling pollution by pollution control measures. He should also be aware of environmental laws related to the control of pollution.

This is to be organized at a stretch for 3 to 4 days. Lectures will be delivered on following broad topics. There will be no examination for this subject.

1. Basics of ecology, eco system and sustainable development

2. Conservation of land reforms, preservation of species, prevention of advancement of deserts and lowering of water table

3. Sources of pollution - natural and man made, their effects on living and non-living organisms

4. Pollution of water - causes, effects of domestic wastes and industrial effluent on living and non-living organisms

5. Pollution of air-causes and effects of man, animal, vegetation and non-living organisms

6. Sources of noise pollution and its effects

7. Solid waste management; classification of refuse material, types, sources and properties of solid wastes, abatement methods, methods of vermicomposting

8. Mining, blasting, deforestation and their effects

9. Legislation to control pollution and protect environment

10. Environmental Impact Assessment (EIA), Elements for preparing EIA statements

11. Current issues in environmental pollution and its control, Global warming
. Green house gases, non-conventional sources of energy, introduction to clean technology.

12. Introduction to Green buildings, site selection, material efficiency, energy efficiency, water efficiency, building form.

Course Outcome:

CO1: A diploma holder must have knowledge of different types of pollution caused due to industries and constructional activities.

CO2: He may help in balancing the eco system and controlling pollution by pollution control measures.

CO3: He should also be aware of environmental laws related to the control of pollution.

Department of Electronics & Communication Engineering
SEMESTER-IV

Course Title: Network Filters Transmission Lines
Course Code: ECE-401
L T P
4 0 0

Max. Marks: 100
External: 60
Internal Assessments: 40
Duration of exam: 3 Hrs

Objective:
The Study of networks, filters and transmission lines leads to understanding of line communication, audio and video communication, and microwave communication. Particularly the study of networks takes off from principles of a.c. theory and introduces the student to parameters and characteristics of various networks, including filters. Also the study of transmission lines becomes important as its analogy is used in study of transmission of plane electromagnetic waves in bounded media.

UNIT-I
Networks
Symmetrical and asymmetrical networks; Balanced and unbalanced network; T-network, Pi network ladder network; lattice network; L-network and bridge T-network.
Symmetrical Networks: Concept and significance of the terms characteristics impedance, propagation constant, attenuation constant, phase in terms of insertion loss. Expression for characteristics impedance propagation, constant, attenuation constant phase shift constant in terms of Zo, Zoc for the following network, Pi , network, Asymmetrical Network:
Concept and significant of iterative impedance, image impedance, image transfer constant and insertion loss. The half section (L-section); symmetrical T and Pi sections into half sections, derivation of iterative impedance, image impedance. Open and short circuit impedance of half section.

UNIT-II
Attenuators
Units of attenuation (decibels and Nepers); General characteristics of attenuators. Analysis and design of simple attenuator of following types; symmetrical T and Pi type, L type

UNIT-III
Filters
Brief idea of the use of filter networks in different communication system. Concept of low high pass, band pass and band stop filters. Theorem connecting attenuation constant and characteristics impedance (Zo); determination of cut off frequency, constant K section. Prototype filters section:
Reactance's-frequency characteristics of a low-pass filter and its significance. Attenuation Vs frequency: phase shift Vs frequency, characteristics impedance Vs frequency of T and Pi curves and their significance. Simple design problems of prototype low pass section. M- Derived Filter Sections, Limitations of prototype filters, need of m-derived filters, Expressions for m in terms of fc (cut off frequency) and foo (frequency at which attenuation is infinity) for low pass and high pass filters. Simple design problems of m-derives low pass and high pass filters.T and Pi high pass filter section:

reactance frequency curve of a high pass prototype filter and its significance. Plots of attenuation, phase shift, characteristic impedance of T and Pi sections with frequency and their significance. Simple design problems of prototype

UNIT-IV

Matching of filters and crystal Filters:

Impedance matching half section, Terminating half sections, Design problems of composite simple filter, Crystal and its equivalent circuits. Special properties of piezoelectric filters and their use.

UNIT-V

Transmission Lines

Transmission lines and their application: shapes of different types of transmission lines; (including) 300 ohms antenna feeder cable, 75 ohm co-axial cable)Distributed (or primary)constant of transmission line, equivalent circuit of an infinite line, T and Pi type representation of a section of transmission line.

Definition of characteristics impedance of line; concept of short line termination in Zo; currents and voltage along an infinite line, propagation constant attenuation and phase shift constant attenuation and phase shift constant of the line. Relationship of characteristic impedance, propagation constant attenuation constant and phase necessity and different method s of loading the communication line. Concept of reflection and standing waves on a transmission line; definition of reflection coefficient in terms of characteristics impedance and load relation between VSWR and voltage reflection co-efficient, maximum impedance on a line in terms of characteristics impedance and VSWR.

Course Outcome:

CO1: Able to make the connection of pi filter
CO2: able to make the connection of T filter.
CO3: Able to understand the concept of transmission lines.
CO4: Able to understand the electrical networks.

RECOMMENDED BOOKS

1. Electrical & Electronics Measuring instrumentation, A.K Sawtney
2. Network Analysis, G.K. Mithal
3. Network Filters and Transmission line by Umesh Sinha
4. Network Lines and fields by John D Rider

NOTE FOR PAPER SETTER: The question paper shall comprise of 80 marks. Two questions will be set from each unit; the student has to attempt five questions, at least one from each unit.

Department of Electronics & Communication Engineering
SEMESTE-IV

Course Title: Communication System– I	Max.Marks:100
Course Code: ECE-402	External: 80
L T P	Internal Assessments: 40
4 0 0	Duration of exam: 3 Hrs

Objective:
This course provides the basics of electronic communication systems including transmitters, receivers, antennas and various modes of propagation of signals. In addition to components and systems of fiber optic communication, the students will learn the basics of satellite communication. This course will provide the students with perspectives of different communication systems.

UNIT - 1
AM/FM Transmitters

a) Classification of transmitters on the basis of modulation, service, frequency and power
b) Block diagram of AM transmitters and working of each stage
c) Block diagram and working principles of reactance FET and armstrong FM transmitters

UNIT – 2
AM/FM Radio Receivers

a) Principle and working with block diagram of super heterodyne AM receiver. Function of each block and typical waveforms at input and output of each block
b) Performance characteristics of a radio receiver: sensitivity, selectivity, fidelity, S/N ratio, image rejection ratio and their measurement procedure. ISI standards on radio receivers (brief Idea)
c) Selection criteria for intermediate frequency (IF). Concepts of simple and delayed AGC
d) Block diagram of an FM receiver, function of each block and waveforms at input and output of different blocks. Need for limiting and de-emphasis in FM reception
e) Block diagram of communication receivers, differences with respect to broadcast receivers.

UNIT – 3
Antennas:

a) Electromagnetic spectrum and its various ranges: VLF, LF, MF, HF, VHF, UHF, Microwave.
b) Physical concept of radiation of electromagnetic energy from a dipole. Concept of polarization of EM Waves.
c) Definition and physical concepts of the terms used with antennas like point source, gain directivity, aperture, effective area, radiation pattern, beam width and radiation resistance, loss resistance.
d) Types of antennas-brief description, characteristics and typical applications of half wave dipole, medium wave (mast) antenna, folded dipole, turns tile, loop antenna, yagi and ferrite rod antenna (used in transistor receivers)

e) Brief description of broad-side and end fire arrays, their radiation pattern and applications (without analysis); brief idea about Rhombic antenna and dish antenna

UNIT - 4

Propagation:

a) Basic idea about different modes of wave propagation and typical areas of application. Ground wave propagation and its characteristics, summer field equation for field strength.

b) Space wave communication – line of sight propagation, standard atmosphere, concept of effective earth radius range of space wave propagation standard atmosphere

c) Duct propagation : sky wave propagation - ionosphere and its layers. Explanation of terms - virtual height, critical frequency, skip distance, maximum usable frequency, multiple hop propagation.

UNIT - 5

Fibre Optic Communications*:*

- Advantages of Fibre Optic Communication
- Block Principle of Light Penetration and Propagation, NA.
- Types of optical fibres and cables.
- Brief idea of Losses in Optical Fibres and Dispersion
- Working principles and characteristics of optical light sources and light detectors.
- Block diagram of fibre optic communication link.
- Basic idea of fibre connection techniques - splicing and lensing

Satellite Communications*:*

- Basic idea, passive and active satellites, Meaning of the terms; orbit, apogee, perigee
- Geo-stationary satellite and its need. Block diagram and explanation of a satellite communication link.

Course Outcome:

CO1: understand the various blocks that constitute the digital communication system and understand how they interrelate.
CO2: understands the basics concepts of wired and wired medium used for communications.
CO3: understand the basics concepts of various mode of propagations.
CO4: understand the basics concepts of Antennas used in the process of communications.

RECOMMENDED BOOKS

1. Communication systems By George Kennedy Tata McGraw Hill, New Delhi.
2. Communication systems By A.K. Gautam, SK Katria and Sons, New Delhi.
3. Electronic communication sytesms By K.S. Jammal, Dhanpat Rai and Sons, New Delhi.

4. Electronic communication system by Roddy and Coolen Prentice Hall of India, New Delhi.
5. Handbook of Experiments in Electronics and Communication Engineering by S. Poornachandra Rao, and B Sasikala, Vikas Publishing House Pvt Ltd, Jangpura, New Delhi
6. Optical fibre Communication by Fraser.

Department of Electronics & Communication Engineering
SEMESTER-IV

Course Title: Power Electronics
Course Code: ECE-403
L T P
4 0 0

Max.Marks: 100
External: 60
Internal Assessments: 40
Duration of exam: 3 Hrs

Objective

Diploma holders in Electronics and related fields are required to handle a wide variety of power electronic equipment used in process control Industry. This subject will provide the student basic understanding of the principles of their working. The practical training will further re-inforce the knowledge and skill of the students.

UNIT-I

Introduction to thyristors and other power electronics devices

Construction, working principles of SCR, two transistor analogy of SCR, VI characteristics of SCR.SCR specifications and ratings. Different methods of SCR triggering. Create Triggering using R, RC and UJT triggering. Different commutation circuit for SCR. Series and parallel operation of SCR. Construction and working principle of DIAC, TRIAC & their V-I characteristics.Construction, working principle of UJT, VI characteristics of UJT. UJT as relaxation oscillator.Brief introduction to Gate Turn off thyristors (GTO), Programmable uni-junction transistor (PUT), Basic idea about the selection of Heat sink for thyristors.Application of SCR such as light intensity control, speed control of universal motors, fan regulator, battery charger.

UNIT-II

Controlled Rectifiers

Single phase half wave controlled rectifier with load (R, R-L), Single phase half controlled full wave rectifier (R, R-L)
Fully controlled full wave bridge rectifier. Single phase full wave centre tap rectifier.

UNIT-III

Inverters, Choppers, Dual Converters and Cyclo converters.

Principle of operation of basic series and parallel inverter circuits, concepts of duty cycle of series and parallel. Inverters & their application.
Choppers: Introduction, types of choppers (Class A, Class B, Class C and Class D). Step up and step down choppers. Dual Converters and Cyclo converters: Introduction, types and basic working principle of dual converters and Cyclo converters and their application.

UNIT-IV

Thyristorised Control of Electric Drives

DC drive control: Half wave drives. Full wave drives, Chopper drives (Speed control of DC motor using choppers)

AC drive control: Phase control (Speed control of induction motor using variable frequency), Constant V/F, operation, Cyclo converter/Inverter drives. Slip power control of AC drives.

UNIT-V

Uninterrupted Power supplies

UPS, on-line, off line & its specifications

Course Outcome:

CO1:Learn the principles of operation of power electronic devices.
CO2: Understand how to design dc-dc power converters
CO3: Understand the concept of cyclo-converter.
CO4:Learn to design a feedback loop for a dc-dc converter
CO5:Understand the principles of operation of speed control drives

RECOMMENDED BOOKS

1. Power Electronics by P.C. Sen: Tata Mc Graw Hill Publishing Co. New Delhi
2. Power Electronics by P.S. Bhimbhrah, Khanna Publishers, New Delhi
3. Power Electronics by M.S. Berde, Khanna Publishers, New Delhi.
4. Power Electronics by MH Rashid
5. Industrial Electronics and Control by SK Bhattacharya and S. Chatterji, New Age Publications. New Delhi
6. Power Electronics by S Rama Reddy, Narosa Publishing House Pvt. Ltd., New Delhi
7. Power Electronics by Sugandhi and Sugandhi
8. Power Electronics – Principles and Applications by J Michael Jacob, Vikas Publishing House, New Delhi

NOTE FOR PAPER SETTER: The question paper shall comprise of 80 marks. Two questions will be set from each unit; the student has to attempt five questions, at least one from each unit.

Department of Electronics & Communication Engineering
SEMESTER-IV

Course Title: Microprocessors
Course Code: ECE-404
L T P
4 0 0

Max.Marks: 100
External: 80
Internal Assessments: 40
Duration of exam: 3 Hrs

Objective

The study of microprocessors in terms of architecture, software and interfacing techniques leads to the understanding of working of CPU in a microcomputer. The development in microprocessors of 32 bit architecture brings them face-to-face with mainframe finding employment in R&D, assembly, repair and maintenance of hardware of microprocessors and computers. Microprocessors find application in process control industry. They also form a part of the electronic switching system between source and destination in long distance telecommunications. Thus the microprocessor is an area of specialization. Students of electronics and related engineering branches often use microprocessors to introduce programmable control in their projects, in industrial training.

UNIT-I

Introduction

Microprocessors – evolution, importance and Application

UNIT-II

Architecture of a Microprocessor – 8085

Concept of bus and bus organisation, Functional block diagram and function of each block, Pin details of 8085 and related signals, Demultiplexing of address/data bus and memory read/write cycles.

UNIT-III

Instruction Set for Intel 8085

Instruction and data format – opcode and operand and its word size, Instruction cycle, machine cycle, T-states, fetch cycle, and execute cycle, Different addressing modes, Status flags and their importance , Data transfer, arithmetic and logical operation, branding, and machine control instructions, Use of stacks and subroutines, Assembly language programming

UNIT-IV

Interfacing and Data Transfer Schemes

Memory mapped I/O and I/O mapped I/O schemes, Interrupts of 8085, Programmable data transfer, DMA data transfer and interrupt driven data transfer schemes with their applications

UNIT-V

Peripheral Devices
Detailed study of the following
8255 PPI and 8253 PIT

Course Outcome:

CO1: To understand the basics architecture of 8-bit microprocessor.
CO2: Able to write programme on 8085 microprocessor based system.
CO3: Indentify the addressing modes of instructions
CO4: Develop programming skills in assembly language.

RECOMMENDED BOOKS

1. Microprocessor Architecture, Programming and Applications with 8085 by RS Gaonkar.
2. Microprocessor and Applications by B Ram
3. Comprehensive Study of Microprocessor by Naresh Grover
4. Introduction to Microprocessor by Adithya p Mathur, Tata McGraw Hill publishers, New Delhi
5. Introduction to Microprocessor by Naresh Gupta

NOTE FOR PAPER SETTER: The question paper shall comprise of 80 marks. Two questions will be set from each unit; the student has to attempt five questions, at least one from each unit.

Department of Electronics & Communication Engineering
SEMESTER-IV

Course Title: Generic Skills and Entrepreneurship Development
Course Code: DCE/DEE/DME/DECE– 405
L T P
4 0 0

Max. Marks: 100
External: 60
Internal Assessment: 40
Duration of Exam: 3 Hrs

RATIONALE

Generic Skills and Entrepreneurship Development is one of the courses from "Human Science" subject area. Generic skills have emerged as an important component of employability skills, which enable an individual to become and remain employable over lifetime and to lead happy and prosperous life. Entrepreneurship development aims at developing conceptual understanding for setting-up one's own business venture/enterprise. This aspect of Human Resource Development has become equally important in the era, when wage employment prospects have become meager.

Both the subject areas are supplementary to each other and soft skills are required to be developed in diploma passouts for enhancing their employability and self confidence.

UNIT- I

Introduction to Generic Skills and Managing Self

Importance of Generic Skill Development (GSD)
Global and Local Scenario of GSD
Life Long Learning (LLL) and associated importance of GSD.
Knowing Self for Self Development
Self-concept, personality traits, multiple intelligence such as language intelligence, numerical intelligence, psychological intelligence etc.
Managing Self – Physical
Personal grooming, Health, Hygiene, Time Management
Managing Self – Intellectual development

- Information Search: Sources of information
- Listening: Effective Listening
- Speaking: Effective Oral Communication
- Reading: Purpose of reading, different styles of reading, techniques of systematic reading;
- Note Taking: Importance and techniques of note taking
- Writing: Correspondence - personal and business

Managing Self – Psychological

- Stress, Emotions, Anxiety-concepts and significance (Exercises related to stress management)
- Techniques to manage the above

UNIT-II

Managing in Team

Team - definition, hierarchy, team dynamics

Team related skills- sympathy, empathy, co-operation, concern, lead and negotiate, work well with people from culturally diverse background

Communication in group - conversation and listening skills

UNIT-III

Task Management and Problem Solving

Task Initiation, Task Planning, Task execution, Task close out

Exercises/case studies on task planning towards development of skills for task management

Prerequisites of problem solving- meaningful learning, ability to apply knowledge in problem solving

Different approaches for problem solving.

Steps followed in problem solving.

Exercises/case studies on problem solving

UNIT-IV

Entrepreneurship

Introduction

Concept/Meaning and its need

Competencies/qualities of an entrepreneur

Entrepreneurial Support System e.g., District Industry Centres (DICs), Commercial Banks, State Financial Corporations, Small Industries Service Institute (SISIs), Small Industries Development Bank of India (SIDBI), National Bank of Agriculture and Rural Development (NABARD), National Small Industries Corporation (NSIC) and other relevant institutions/organizations at State/National level.

UNIT-V

Market Survey and Opportunity Identification (Business Planning)

- How to start a small scale industry
- Procedures for registration of small-scale industry
- List of items reserved for exclusive manufacture in small-scale industry
- Assessment of demand and supply in potential areas of growth.
- Understanding business opportunity

- Considerations in product selection
- Data collection for setting up small ventures.

Project Report Preparation

- Preliminary Project Report
- Techno-Economic Feasibility Report
- Exercises on Preparation of Project Report in a group of 3-4 students

Course Outcome:

CO1: Able to start a small business.
CO2: Able to communicate freely.
CO3: Able to manage the staff.

INSTRUCTIONAL STRATEGY

This subject will require a blend of different teaching and learning methods beginning with lecture method. Some of the topics may be taught using question answer, assignment, case studies or seminar. In addition, expert lectures may be arranged from within the institution or from management organizations. Conceptual understanding of Entrepreneurship, inputs by teachers and outside experts will expose the students so as to facilitate in starting ones own business venture/enterprise. The teacher will discuss success stories and case studies with students, which in turn, will develop managerial qualities in the students. There may be guest lectures by successful diploma holding entrepreneurs and field visits also. The students may also be provided relevant text material and handouts.

RECOMMENDED BOOKS

1. Generic skill Development Manual, MSBTE, Mumbai.
2. Lifelong learning, Policy Brief (www.oecd.org)
3. Lifelong learning in Global Knowledge Economy, Challenge for Developing Countries – World Bank Publication
4. Towards Knowledge Society, UNESCO Paris Publication
5. Your Personal Pinnacle of Success by DD Sharma, Sultan Chand and Sons, New Delhi
6. Human Learning, Ormrod
7. A Handbook of Entrepreneurship, Edited by BS Rathore and Dr JS Saini; Aapga Publications, Panchkula (Haryana)
8. Entrepreneurship Development by CB Gupta and P Srinivasan, Sultan Chand and Sons, New Delhi
9. Handbook of Small Scale Industry by PM Bhandari
10. Generic Skills and Entrepreneurship Development by Ishan Publishers (Ambala)

Generic Skills and Entrepreneurship Development by Poonam Goyal (GBD)-Punjab

NOTE FOR PAPER SETTER: The question paper shall comprise of 60 marks. Two questions will be set from each unit. The student has to attempt five questions, at least one from each unit

Department of Electronics & Communication Engineering
SEMESTER-IV

Course Title: Network Filters Transmission Lines-Lab	Max.Marks: 50
Course Code: ECE-411	External: 25
L T P	Internal Assessments: 25
0 0 1	Duration of exam 3 Hrs

LIST OF PRACTICALS

1. To measure the characteristic impedance of a symmetrical and Pi network
2. To measure the image impedance of a given asymmetrical T/Pi network
3. For a prototype low pass filter:
4. Determine the characteristic impedance experimentally
5. Plot the attenuation characteristics
6. To design and measure the attenuation of a symmetrical T/Pi type attenuator.
7. For a prototype high pass filter:
8. Determine the characteristics impedance experimentally
9. To plot the attenuation characteristics
10. To plot the impedance characteristics of a prototype band-pass filter
11. To plot the attenuation characteristics of a prototype band-pass filter.
12. To plot the impedance characteristic of am-derived low pass filter
13. To plot the attenuation characteristics of a m-derived high pass filter.
14. To observe the formation of standing waves on a transmission line and measurement of SWR and Characteristic impedance of the line.

Course Outcome:

CO1: Able to work on electrical network bench.
CO2: Able to work on transmission line work bench.
CO3: Able to make the connections and get the output signa

Department of Electronics & Communication Engineering
SEMESTER-IV

Course Title: Communication System – I Lab	Max.Marks: 50
Course Code: ECE-412	External: 25
L T P	Internal Assessments: 25
0 0 2	Duration of exam: 3 Hrs

LIST OF PRACTICALS

1. To observe the waveforms at different stages of a AM transmitter
2. To observe the waveforms at different stages of a Radio Receiver
3. To align AM broadcast radio receiver
4. To identify and study the various types of antennas used in different frequency ranges.
5. To plot the radiation pattern of a directional and omni directional antenna
6. To plot the variation of field strength of a radiated wave, with distance from a transmitting antenna
7. Familiarisation and identification of fibre optic components such as fibre optic light source, detector, connector assembly etc
8. To assemble the fibre optic communication set up (using teaching module) and compare the transmitted signal with the output of the receiver
9. To measure the light attenuation of the optic fibres

Course Outcome:

CO1: Generation of AM Modulation and Demodulation using the modulation/demodulation communication kits .
CO2. Generation of FM Modulation and Demodulation using the modulation/demodulation kits.
CO3. Construct & test PAM Generation circuit & Detection circuit.
CO4. Construct & test PCM Transmitter & Receiver circuit.

Department of Electronics & Communication Engineering
SEMESTER-IV

Course Title: Power Electronics -Lab
Course Code: ECE-413
L T P
0 0 2

Max.Marks: 50
External: 25
Internal Assessments: 25
Duration of exam: 3 Hrs

LIST OF PRACTICALS

1. To plot VI characteristic of an SCR.
2. To plot VI characteristics of TRIAC.
3. To plot VI characteristics of UJT.
4. To plot VI characteristics of DIAC.
5. Study of UJT relaxation oscillator. And observe I/P and O/P wave forms
6. Observation of wave shape of voltage at relevant point of single-phase half wave controlled rectifier and effect of change of firing angle.
7. Observation of wave shapes of voltage at relevant point of single phase full wave controlled rectifier and effect of change of firing angle.
8. Observation of wave shapes and measurement of voltage at relevant points in TRIAC based AC phase control circuit for.
9. Varying lamp intensity and AC fan speed control.
10. Installation of UPS system and routine maintenance of batteries.
11. Speed control of motor using SCRs

Course Outcome:

CO1: Understand the V-I characteristics of power electronics devices like SCR, TRIAC, DIAC, UJT etc.
CO2: Study the operation of UJT relaxation oscillator.
CO3: Study the installation of UPS.
CO4: understand the operation of speed control drives.

Department of Electronics & Communication Engineering
SEMESTER-IV

Course Title: Microprocessors Lab.
Course Code: ECE-414
L T P
0 0 2

Max.Marks: 100
External: 50
Internal Assessments: 50
Duration of exam: 3 Hrs

LIST OF PRACTICALS

1. Familiarisation with 8085 microprocessor kit.
2. Steps to enter, modify data/program and to execute a programme on 8085 kit
3. Writing and execution of ALP for addition and substation of two 8 bit numbers
4. Writing and execution of ALP for multiplication and division of two 8 bit numbers
5. Writing and execution of ALP for arranging numbers in ascending/descending order
6. Writing and execution of ALP for multiplication of two 16 bit numbers
7. Interfacing exercise on 8255 like LED display control
8. Interfacing exercise on 8253 programmable interval timer

Course Outcome:

CO1: Able to understand 8085 pin configuration.
CO2: Able to make simple programs and get the output signal.
CO3: Able to interface 8085 with key board etc.

Department of Electronics & Communication Engineering

SEMESTER-IV

Course Title: Troubleshooting of Electrical Equipments.	Max.Marks: 100
Course Code: ECE-415	External: 60
L T P	Internal Assessments: 40
4 0 0	Duration of exam: 3 Hrs

Objective:

The course provides the students with necessary knowledge and competency to diagnose the faults for trouble shooting and for systematic repair and maintenance of electronic equipment and testing of components.

NOTE: Students are to be given the awareness about the following topics during the Laboratory Work. There will not be any theory examination.

TOPICS TO BE DISCUSSED

1. Repair, Servicing and Maintenance Concepts

Introduction, Modern electronic equipment, Mean time between failures (MTBF), Mean time to repair (MTR), Maintenance policy, potential problems, preventive maintenance, corrective maintenance.

a) Study of basic procedure of service and maintenance
b) Circuit tracing techniques
c) Concepts of shielding, grounding and power supply considerations in instruments.

2. Fundamental Trouble Shooting Procedures

I) Fault location
ii) Fault finding aids
- Service manuals
- Test and measuring instruments
- Special tools

iii) Trouble Shooting Techniques
- Functional Areas Approach
- Split half method
- Divergent, convergent and feedback path circuit analysis
- Measurement techniques

3. Mobile Phones
- Identification of various parts of mobile phones
- Repair and maintenance of mobile phones
- Software installation in mobile phones
- Common faults

4. Trouble shooting and maintenance of testing equipment like C.R.O , function generator, power supplies and other measuring devices, detailed discussion about trouble shooting of medical,

electronic equipment like, ECG, EEG, Ultra sound. Repair and maintenance and exposure of medical electronics equipment through industrial visits.

5. Troubleshooting Digital Systems

Typical faults in digital circuits. Use of logic clip, logic pulsar, IC tester

Course Outcome:

CO1: Able to repair the electronic circuits.

CO2: Able to repair the multimeter, CRO etc.

CO3: Able to trouble shoot small electronic equipments.

Department of Electronics & Communication Engineering
SEMESTER-IV

Course Title: Entrepreneurial Awareness Camp — Max. Marks: 50
Course Code: DCE/DEE/DME/DECE-416 — Internal Assessment: 50

L T P
0 0 4

This is to be organized at a stretch for two to three days during or at the end of 4th semester. Lectures will be delivered on the following broad topics. There will be no examination for this subject.

1. Who is an entrepreneur?

2. Need for entrepreneurship, entrepreneurial career and wage employment

3. Scenario of development of small scale industries in India

4. Entrepreneurial history in India, Indian values and entrepreneurship

5. Assistance from District Industries Centres, Commercial Banks. State Financial Corporations, Small industries Service Institutes, Research and Development Laboratories and other financial and development corporations

6. Considerations for product selection

7. Opportunities for business, service and industrial ventures

8. Learning from Indian experiences in entrepreneurship (Interaction with successful entrepreneurs)

9. Legal aspects of small business
10. Managerial aspects of small business

Course Outcome:

CO1: Students are made to understand the aim of entrepreneurship

CO2: To understand the scope of self employment generation.

CO3: To understand the various schemes of Govt. for entrepreneurship and employment generations

Department of Electronics & Communication Engineering
SEMESTER-V

Course Title: Consumer Electronics
Course Code: ECE-501
L T P
4 0 0

Max.Marks: 100
External: 60
Internal Assessments: 40
Duration of exam: 3 Hrs

Objective:
The objective of teaching this subject is to give students an in depth knowledge of various electronic audio and video devices and systems. Further this subject will introduce the students with working principles, block diagram, main features of consumer electronics gadgets/goods/devices like audio-systems, CD systems. TV and other items like digital clocks, calculators, microwave ovens, Photostat machines etc. Which in-turn will develop in them capabilities of assembling, fault diagnosis and rectification in a systematic way.

UNIT-I
Audio System
Microphones: construction, working principles and applications of microphones, their types viz: Carbon, moving coil, velocity, crystal, condenser, cordless etc. Loud Speaker: Direct radiating, horn loaded woofer, tweeter, mid range, multi-speaker system, baffles and enclosures.
Sound recording on magnetic tape, its principles, block diagram, and tape transport mechanism
Digital sound recording on tape and disc, CD system, Hi-Fi system, pre-amplifier, amplifier and equalizer system, stereo amplifiers

UNIT-II
Monochrome TV
Elements of TV communication system. Scanning- its need for picture transmission. Need for synchronizing and blanking pulses. Progressive scanning- Gross structure, interlaced scanning, resolution and band width requirement, tonal gradation. Composite Video Signal (CVS) at the end of even and odd fields. Equalizing pulses and their need, Monochrome picture tube – construction and working, comparison of magnetic and electric deflection of beam, Construction and working of camera tube: vidicon and plumbicon, Block diagram of TV camera and the transmitter. Block diagram of a TV receiver: function of each block and waveform at the input and output of each block. Concept of positive and negative modulation VSB Transmission Tuner

UNIT-III
Colour TV
Primary colours, tristimulus values, trichromatic coefficients, concepts of additive and subtracting mixing of colours, concepts of luminance, Hue and Saturation, Representation of a colour in colour triangle, non spectral colour, visibility curve, Compatibility of colour TV system with monochrome system. Block diagram of colour TV camera.
Colour Schemes: Introduction to PAL, NTSC, SECAM systems, Advantages and disadvantages, block diagram of , video camera and its explanation, Construction and working principles of Trinitron and PIL types of colour picture tubes. Concept of convergence, purity of beam shifting, Block diagram of PAL TV receiver, explanation and working

UNIT-IV

Cable Television, VCD, DVD and VC

Block diagram and principles of working of cable TV and DTH, cable TV
Principle of video recording on CDs and DVDs. Recordable and Rewritable CDs. Study of VCD and DVD Systems. Hi-Fi system, pre-amplifier, amplifier and equalizer system, stereo amplifiers
Introduction of functioning of digital movie and still camera

UNIT-V

Basic Block Diagram

Working Principle and Application of:
Cordless Telephone, Photostat Machine, Electronic Ignition system for automobiles
Cellular Phones, Microwave Oven

Course Outcome:

CO1: To have in depth knowledge of various electronic audio and video devices and systems.
CO2: Understand working principles, block diagram, main features of consumer electronics gadgets/goods/devices like audio-systems, CD systems. TV and other items like digital clocks, calculators, microwave ovens, Photostat machines etc.
CO3: To develop in them capabilities of assembling, fault diagnosis and rectification in a systematic way.

RECOMMENDED BOOKS

1. Colour Television-principles & practice R.R Gulati by Wiley Eastern Limited, New Delhi
2. Complete Satellite & cable Television R.R Gulati New age International Publisher, New Delhi
3. Colour Television Servicing by RC Vijay BPB Publication, New Delhi
4. Colour Television & Video Technology by A.K. Maini CSB Publishers
5. VCR-principles, maintenance & repair by S.P. Sharma, Tata McGraw Hill, New Delhi
6. Colour TV by A.Dhake
7. Service Manuals, BPB Publication, New Delhi
8. Audio and video system by RG Gupta

NOTE FOR PAPER SETTER: The question paper shall comprise of 80 marks. Two questions will be set from each unit; the student has to attempt five questions, at least one from each unit.

Department of Electronics & Communication Engineering
SEMESTER-V

Course Title: Communication System – II
Course Code: ECE-502
L T P
4 0 0

Max.Marks: 100
External: 60
Internal Assessments: 40
Duration of exam: 3 Hrs

Objective:
This course deals with the advanced digital and data communication techniques beyond the conventional communication. It involves the use of modems in synchronous and asynchronous data transmission. It encompasses the modern communication network and integrated services like ISDN and Radio paging along with cellular mobile telephones, FAX, electronic exchanges etc. so vital for present day communication

Unit – 1
Introduction:
Basic block diagram of digital and data communication systems. Their comparison with analog communication systems.

Unit – 2
Coding

a) Introduction to various common codes 5 bit Baudot code, 7 bit ASCII, ARQ, EBCDIC
b) Code error detection and correction techniques - Redundancy, parity, block check character (BCC), Vertical Redundancy check (VRC), Longitudinal Redundancy Check (LRC), Cyclic Redundancy check (CRC), Hamming code

Digital Modulation Techniques:

- Basic block diagram and principle of working of the following:
- Amplitude shift keying (ASK): Interrupted continuous wave (ICW), two tone modulation
- Frequency Shift keying (FSK)
- Phase shift keying (PSK), Quadrature Phase Shift Keying(QPSK)
- Spread Spectrum Techniques, Frequency Hopping Technique

Unit – 3
Characteristics/working of data transmission circuits; bandwidth requirements, data transmission speeds, noise, cross talk, echo suppressors, distortion, equalizers
UART, USART: Their need and function in communication systems

UNIT – 4
Modems:

Need and function of modems, Mode of modems operation (low speed, medium speed and high speed modems). Modem interconnection, Modem data transmission speed, Modem modulation method, Modem interfacing (RS 232 Interface, other interfaces).

Telemetry:
Radio-telemetry and its application. Block diagram of TDM and FDM telemetry system

Unit – 5

Electronic Exchange:

- Typical telephone network. Various switching offices (Regional Centre, District Centre, Toll Centre, Local Office) and their hierarchy.
- Principles of space division switches. Basic block diagram of a digital exchange and its working.
- Combined space and time switching: Working principle of STS and TST switches.
- Functions of the control system of an automatic exchange. Stored programme Control (SPC) processor and its application in electronic exchange and rural telephone exchange.
- Introduction to PBX, PABX and EPABX.

Facsimile (FAX)

Basic idea of FAX system and its applications. Principle of operation and block diagram of modern FAX system. Important features of modern FAX machines.

Course Outcome:

CO1: To deals with the advanced digital and data communication techniques beyond the conventional communication.

CO2: To understand the use of modems in synchronous and asynchronous data transmission.

CO3: To understand the modern communication network and integrated services like ISDN and Radio paging along with cellular mobile telephones, FAX, electronic exchanges etc. so vital for present day communication

RECOMMENDED BOOKS

7. Communication systems By George Kennedy Tata McGraw Hill, New Delhi.
8. Communication systems By A.K. Gautam, SK Katria and Sons, New Delhi.
9. Electronic communication sytesms By K.S. Jammal, Dhanpat Rai and Sons, New Delhi.
10. Electronic communication system by Roddy and Coolen Prentice Hall of India, New Delhi.
11. Handbook of Experiments in Electronics and Communication Engineering by S. Poornachandra Rao, and B Sasikala, Vikas Publishing House Pvt Ltd, Jangpura, New Delhi
12. Optical fibre Communication by Fraser.

NOTE:

Visits to the sites of all types of telephone exchanges (including mobile and rural exchanges), FAX and Carrier telephony should be made with a view to understand their working. A comprehensive report must be prepared by all the students on these visits, especially indicating the dates and locations of their visits

Department of Electronics & Communication Engineering
SEMESTER-V

Course Title: Signals and Systems	Max.Marks: 100
Course Code: ECE-503	External: 60
L T P	Internal Assessments: 40
4 0 0	Duration of exam: 3 Hrs

Objective: The objective of this course is to study and analyze the characteristics of continuous, discrete signals and systems**.**

Unit-I

Introduction: Definitions of a signal and a system, classification of signals, basic Operations on signals, elementary signals, Systems viewed as Interconnections of operations, properties of systems. Sampling theorem – Graphical and analytical proof for Band Limited Signals, impulse sampling, effect of under sampling – Aliasing

Unit-II

Time-domain representations for LTI systems–1: Convolution, impulse response representation, Convolution Sum and Convolution Integral. Properties of impulse response representation, Block diagram representations.

Unit-III

Fourier representation for signals–1: Fourier representation for signals –: Discrete and continuous Fourier transforms (derivations of transforms are excluded) and their properties. Applications of Fourier representations**:** Introduction, Frequency response of LTI systems, Fourier transform representation of periodic signals, Fourier transform representation of discrete time signals

Unit-IV

Laplace Transforms–1: Introduction, Laplace transform, properties of ROC, properties of Laplace transforms, inversion of Laplace transforms. Transform analysis of LTI Systems, unilateral Laplace Transform and its application to solve differential equations and analysis of electric circuits.

Unit-V

The Z Transform: Z-Transform, Region of convergence; Properties of the Z-transform; inversion of Laplace transforms. Transform analysis of LTI Systems, Unilateral Z-transform and its application to difference equations with non-zero initial condition.

Course Outcome:

CO1: To understand the meaning of Signals and system.

CO2: To understand the time-doman representation of signals

CO3: To perform the analysis of signals using different operation.

Reference Books:

1. **V. Oppenheim Alan, S. Alan, Willsky & Nawab Hamid A.,** Signals and Systems, PHI, 2nd Ed., 1998
2. **H. P Hsu, R. Ranjan,** "Signals and Systems", Scham's outlines, TMH, 2006.
3. **Ganesh Rao and Satish Tunga,** Signals and Systems, Sanguine Technical Publishers, 2004.

Note for paper setter: The question paper shall comprise of 10 questions. Two questions will be set from each unit. The student has to attempt five questions at least one question from each unit.

Department of Electronics & Communication Engineering
SEMESTER-V

Course Title: Electrical Machines
Course Code: ECE-504
L T P
4 0 0

Max.Marks: 100
External: 60
Internal Assessments: 40
Duration of exam: 3 Hrs

Objective:

Electrical machines is a subject where a student will deal with various types of electrical machines which are employed in industries, power stations, domestic and commercial appliances etc. After studying this subject, diploma holder in Instrumentation and Control must be competent to repair and maintain these machines and give suggestions to improve their performance. Practical aspects of the subject will make the students capable of performing various tests on the machines as per latest BIS specifications

UNIT-I

Three phase Supply and Transformers

Three Phase Supply, Advantage of three-phase system over single-phase system. Star Delta connections

Relation between phase and line voltage and current in a three phase system, Power and power factor in three-phase system and their measurements by one, two and three Wattmeter methods.

Principle of operation and constructional details of single phase and three-phase transformer, core type and shell type transformers, difference between single phase and three phase transformers, advantages and disadvantages.

Voltage Regulation of a transformer (No Derivation), Losses in a transformer, Efficiency, condition for maximum efficiency and all day efficiency, Auto transformers and instrument transformer, CTs and PTs (Current transformer and potential transformer)

UNIT-II

Introduction to Rotating Electrical Machines

M.F induced in a coil rotating in a magnetic field. Definition of motor and generator, Basic principle of a generator and a motor , Torque due to alignment of two magnetic fields and the concept of Torque angle, Basic Electromagnetic laws, Common features of rotating electrical machines.

UNIT-III

DC Machines

Principle of working of d.c motors and d.c generator, their constructional details, Function of the commutator for motoring and generating action, Factors determining the speed of a DC, motor Different types of excitation, Characteristics of different types of DC machines, Starting of DC motors and starters. Application of DC machines

UNIT-IV

A.C. Motors

Revolving magnetic field produced by poly phase supply, Brief introduction about three phase induction motors, its principle of operation, Types of induction motors and constructional features of squirrel cage and slip-ring motors, Starting and speed control, Star Delta and DOL (Direct-on-line) starters. Reversal of direction of rotation of 3-phase induction motors, Applications of induction motors, Principle and Working of Synchronous Machines (only), Application of Synchronous Machines

UNIT-V

Single Phase Fractional Kilowatt Motors

Introduction , Principle of operation of single phase motors, Types of single phase induction motors and their constructional details (i.e. split phase, capacitor start, capacitor start and run, shaded pole and reluctance start)

Single phase synchronous motors – reluctance motor (hysteresis motor), Commutator type single-phase motors – Repulsion Induction motor, shaded pole motors, AC series motor and universal motors, Introduction to servo- motors and stepper motors, Concept of micro-motors.

Course outcome

After completing this course Students will be able to:

CO1. Understand electrical principle, laws, and working of DC machines.

CO2. Analyze the construction and characteristics and application of various type of DC generators.

CO3. Analyze the construction and characteristics and application of various type of DC motors and testing of motors according to Indian standard.

CO4. Understand electrical principle, laws, and working of 1 phase transformer and losses and also conduct various test on the transformer.

CO5. Understand electrical principle, laws, and working of 3 phase transformer and losses . and also conduct various test on the transformer.

CO6. Analyze the transformer and convert 3 phase transformer to multi phase transformer

RECOMMENDED BOOKS

1. Electrical Machine by SK Bhattacharya, Tata McGraw Hills, New Delhi
2. Electrical Machines by Nagrath and Kothari, Tata McGraw Hills, New Delhi
3. Experiments in Basic Electrical Engineering: by S.K. Bhattacharya, KM Rastogi: New Age International (P) Ltd. Publishers, New Delhi
4. Electrical Machines by SK Sahdev, Unique International Publications, Jalandhar
5. Electrical Technology Vol. - I and II B.L. Thareja, S Chand and Co. New Delhi

NOTE FOR PAPER SETTER: The question paper shall comprise of 80 marks. Two questions will be set from each unit; the student has to attempt five questions, at least one from each unit

Department of Electronics & Communication Engineering
SEMESTER-V

Course Title: Computer Organization and Networks
Course Code: ECE-505
L T P
4 0 0

Max.Marks: 100
External: 80
Internal Assessments: 20
Duration of exam: 3Hrs

Objective

Personal Computers have become a necessity in Industry, offices and becoming popular in homes too. This course gives organization structure and principles of working of various other components like visual display, keyboard drives and printers etc. Diploma holders will find employment in Repair and maintenance field and computer industry.

The future of computer technology is in computer networks. Global connectivity can be achieved through computer networks. A diploma holder in computer engineering should therefore understand the function of networks. Knowledge about hardware and software requirements of networks is essential.

UNIT-I
Introduction
Buses and Ports, Introduction to different types of Bus and Ports including PCI, SCSI, ISA buses
The Keyboard of the PC: The basic principles of the working of a PC keyboard scan codes.
Disk Drives: Constructional Features of Hard Disk, Floppy disk and their drives (HDD and FDD)
Peripheral Devices: Basic features of various other peripheral devices e.g. mouse, printers (DMP, Inkjet, Laser), scanner plotter, digitizer and modem.

UNIT-II
Power Supplies, BIOS and DOS Services
SMPS used in PC, various voltage, basic data of constant voltage transformer (CVT) and un-interrupted power supply (UPS), off-line and on-line.
The basis ideas of BIOS & DOS services for Diskette, serial port, keyboard, printer and Misc. services

UNIT-III
Networking Basics and Transmission Media
Definition of a network. Model of network computing, Introduction to LAN, MAN and WAN, Network services.
Open system Inter-connection Models (OSI), Standards, OSI Reference Models (concept of the seven layers of OSI, Model), Transmission Media

UNIT-IV
Introduction to Network

Topologies and protocols - Protocol Types including Ipx/SPx, TCP/IP Internet Protocols Network Architecture with Element Specification and features, Architecture of TCP/IP network

UNIT-V

Network connectivity Devices/ Network Card:

Principle & working of **:-** Hubs, Repeaters bridges and switches , Routers and Gateways, Preparation of networking cable using BNC/ RJ45 connector, Operation and use of hubs and routers, Sharing of a printer on network.

Course outcome

After completing this course Students will be

CO1: Able to recognize the architectures of processors used in computing systems.
CO2: Able to understand memory hierarchy and virtual memory concept.
CO3: Able to design ALU and IEEE-754 single precision floating point processor.
CO4: Able to realize Micro-programmed control units for a simple processor and a floating point processor.
CO5: Able to identify I/O data transfer techniques and future trends

RECOMMENDED BOOKS

1. Bose, SK, "Hardware and Software of Personal Computers", Wiley Eastern Limited, New Delhi.
2. Hall, Douglas, "Microprocessors and Interfacing", Mc Graw Hill.
3. Uffenbeck – 8086 Microprocessor
4. Computer Networking – A. Tanncnbaum
5. Computer Networking – W. Stallings

NOTE FOR PAPER SETTER: The question paper shall comprise of 80 marks. Two questions will be set from each unit; the student has to attempt five questions, at least one from each unit.

Department of Electronics & Communication Engineering
SEMESTER-V

Course Title: Consumer Electronics - Lab
Course Code: ECE- 511
L T P
0 0 2

Max.Marks: 50
External: 25
Internal Assessments: 25
Duration of exam: 3 Hrs

LIST OF PRACTICALS

1. To plot the frequency response of a Microphone
2. To plot the frequency response of a Loud Speaker
3. Trouble shooting of CD/DVD Player
4. To observe the wave forms and voltage of B/W TV Receiver.
5. To observe the waveforms and voltages of colour TV Receiver
6. Fault finding of colour T.V
7. Demonstration and Operation of Control Panel
   (a) Microwave Oven
   (b) DTH System
   (c) Photostate Machine
   (d) Automative Washing Machine
   (e) Mobile Phone

Course outcome
After comleting this course Students will be able to
CO1: analyse the frequency response of transducers like microphones, loudspeakers etc.
CO2: Able to find out the faults in consumer electronic device like
(a) colour T.V
(b) Microwave Oven
(c) DTH System
(d) Photostate Machine
(e) Automative Washing Machine
(f) Mobile Phone

INSTRUCTION STRATEGY

This subject gives the knowledge of the various day-to-day life electronic products. So, the teacher is required to show and demonstrate the gadgets and impart practical knowledge to the students. For that one should give home assignment and frequent industrial visit should be there. Visit to TV studio and TV transmitter station should be arranged to give a practical exposure to the students

Department of Electronics & Communication Engineering
SEMESTER-V

Course Title: Communication System-Lab
Course Code: ECE- 512
L T P
0 0 2

Max.Marks: 50
External: 25
Internal Assessments: 25
Duration of exam: 3 Hrs

LIST OF PRACTICALS

1. Transmission of Hamming code on a serial link and its reconversion at the receiving end.
2. Observe wave forms at input and output of ASK and FSK modulators
3. To transmit parallel data on a serial link using USART
4. Transmission of data using MODEM.
5. Observe wave forms at input and output of a TDM circuit
6. To study the construction and working of a telephone handset
7. To study the construction and working of a FAX machine.
8. To study the construction and working of an EPABX.

Course outcome
After completing this course Students will be able to:
CO1: Generation of AM Modulation and Demodulation using the modulation/demodulation communication kits .
CO2:Generation of FM Modulation and Demodulation using the modulation/demodulation kits.
CO3.:Construct & test PAM Generation circuit & Detection circuit.
CO4: Construct & test PCM Transmitter & Receiver circuit.

SEMESTER-V

Course Title: Electrical Machines- Lab
Course Code: ECE-513

L	T	P
0	0	2

Max. Marks: 50
External: 25
Internal Assessments: 25
Duration of exam: 3 Hrs

LIST OF PRACTICALS

1. To measure power and power factors in 3 Phase load by two wattmeter method
2. To determine effect of a single phase transformer from the data obtained through open circuit and short circuit test
3. To connect the primary and secondary windings of a three phase transformer and to verify line and phase current and voltage relationship respectively
4. To connect a dc shunt motor with supply through a 3 point starter and to run the motor at different speeds with the help of a field regulator
5. To run a 3 phase squirrel cage induction motor with the help of a star-delta starter. To change the direction of rotation of the motor.
6. To run a 3 phase alternator in synchronism with busbar and to measure its voltage and frequency
7. To run a synchronous motor with a.c supply and to measure speed to verify the relation N=12O f/ P
8. To make connections of starting and running winding of a single phase capacitor motor and to run it with the help a DOL starter and to measure its speed
9. Study construction of a stepper and servo motor and to write their complete specifications.

Course outcome:

After completing this course Students will be able to:

CO1: Deal with various types of electrical machines which are employed in industry, power stations, domestic and commercial appliances etc.

CO2: Repair and maintain these machines and give suggestions to improve their performance.

CO3: Perform open circuit and short circuit test for determining equivalent circuit parameter of a transformer, speed control of motors, measurement of the angular displacement of rotor of the three phase synchronous machine and checking the polarity of the windings

Department of Electronics & Communication Engineering
SEMESTER-V

Course Title: Computer Organization and Networks –Lab. Max.Marks: 100
Course Code: ECE-514 External: 50
L T P Internal Assessments: 50
0 0 2 Duration of exam: 3Hrs

LIST OF PRACTICALS

1. To identify various components, devices and accessories of a PC

2. To interconnect the system unit with the video monitor, mouse and keyboard, and test the operation of the PC.

3. To connect various add-on cards and I/O devices to a PC motherboard, and test their working.

4. To note the voltages and waveforms at various terminals in the I/O channel (Bus Slots).

5. To study the SMPS circuit of a PC, measure various supply voltages, and connect it to the motherboard and other appropriate I/O devices.

6. To study the operation of a CVT used to supply power to a PC

7. To study the operation of an uninterrupted power supply (UPS)

8. To Install and test the Local area Network

Course outcome

After completing this course Students will be
CO1: Able to recognize the architectures of processors used in computing systems.
CO2: Able to understand memory hierarchy and virtual memory concept.
CO3: Able to design ALU and IEEE-754 single precision floating point processor.
CO4: Able to realize Micro-programmed control units for a simple processor and a floating point processor.
CO5: Able to identify I/O data transfer techniques and future trends

Department of Electronics & Communication Engineering
SEMESTER-V

Course Title: Industrial Trainaing — Max.Marks: 100
Course Code: ECE-515 — External: 50
L T P — Internal Assessments: 50
0 0 2 — Duration of exam: 3Hrs

It is needless to emphasize further the importance of Industrial Training of students during their 3 years of studies at Polytechnics. It is industrial training, which provides an opportunity to students to experience the environment and culture of industrial production units and commercial activities undertaken in field organizations. It prepares student for their future role as diploma engineers in the world of work and enables them to integrate theory with practice. Polytechnics have been arranging industrial training of students of various durations to meet the above objectives.

This document includes guided and supervised industrial training of a minimum of 6 weeks duration to be organised during the semester break starting after second year i.e. after IV Semester examinations. The concerned HODs along with other teachers will guide and help students in arranging appropriate training places relevant to their specific branch. It is suggested that a training schedule may be drawn for each student before starting of the training in consultation with the training providers. Students should also be briefed in advance about the organizational setup, product range, manufacturing process, important machines and materials used in the training organization.

Equally important with the guidance is supervision of students training in the industry/organization by the teachers. A minimum of one visit per week by the teacher is recommended. Students should be encouraged to write daily report in their diary to enable them to write final report and its presentation later on.

An internal assessment of 50 and external assessment of 50 marks have been provided in the study and evaluation scheme of V Semester. Evaluation of professional industrial training report through viva-voce/presentation aims at assessing students understanding of materials, industrial process, practices in industry/field organization and their ability to engage in activities related to problem solving in industrial setup as well as understanding of application of knowledge and skills learnt in real life situations. The formative and summative evaluation may comprise of weightage to performance in testing, general behaviour, quality of report and presentation during viva-voce examination. It is recommended that such evaluations may be carried out by a team comprising of concerned HOD, teachers and representative from industry.

Teachers and students are requested to see the footnote below the study and evaluation scheme of IV Semester for further details.

Course Outcome:

CO1: To emphasize further the importance of Industrial Training of students during their 3 years of studies at Polytechnics.

CO2: To emphasize that it is industrial training, which provides an opportunity to students to experience the environment and culture of industrial production units and commercial activities undertaken in field organizations.

CO3: It prepares student for their future role as diploma engineers in the world of work and enables them to integrate theory with practice. Polytechnics have been arranging industrial training of students of various durations to meet the above objectives.

Department of Electronics & Communication Engineering
SEMESTER-V

Course Title: Personality Development Camp
Course Code: ECE-516
L T P
0 0 4

Max. Marks: 50
Internal Assessment: 50

This is to be organized at a stretch for two to three days during fifth or sixth semester. Extension Lectures by experts or teachers from the polytechnic will be delivered on the following broad topics. There will be no examination for this subject.

1. Communication Skills

2. Correspondence and job finding/applying/thanks and follow-up

3. Resume Writing

4. Interview Techniques: In-Person interviews; telephonic interviews, panel interviews; group interviews and video conferencing etc.
5. Presentation Techniques
6. Group Discussions Techniques
7. Aspects of Personality Development
8. Motivation
9. Leadership
10. Stress Management
11. Time Management
12. Interpersonal Relationship
13. Health and Hygiene

Course Outcome:
CO1: To develop the overall personality of the students
CO2: To develop his confidence and communication skill
CO3: To understand the importance of time management & leadership qualities**.**

Department of Electronics & Communication Engineering
SEMESTER-VI

Course Title: Microwave and Radar Engineering
Course Code: ECE-601
L T P
4 0 0

Max.Marks: 100
External: 60
Internal Assessments: 40
Duration of exam: 3 Hrs

Objective

This subject includes an exposure to microwaves engineering, radar systems, fibre optics and satellite communication. In microwaves industry, job opportunities are available in of assembly, production, installation, repair and maintenance of microwave transmitters and receivers. The knowledge of radar systems allows opportunities with civil and defence organizations dealing with aircraft and shipping. Fibre optics is the latest thrust area in communication with vast opportunities in the private sector.

UNIT-I

Introduction to Microwaves and Microwave Devices

Introduction to microwaves and its applications, Classification on the basis of its frequency bands (HF,VHF, UHF, L, S, C, X, KU, KA, mm, SUB, mm)

Basic concepts of thermionic emission and vacuum tubes, Effects of inter-electrode capacitance Lead Inductance and Transit time on the high frequency performance of conventional vacuum tubes, and steps to extend their high frequency operations.

Constructional, characteristics, operating principles and typical applications of the following devices (No mathematical treatment)

Multi cavity klystron, Reflex klystron, Multi-cavity magnetron, Traveling wave tube, Gunn diode and, Impatt diode

UNIT-II

Wave guides and Microwave Components

Rectangular and circular wave guides and their applications. Mode of wave guide; Propagation constant of a rectangular wave guide, cut off wavelength, guide wavelength and their relationship with free space wavelength (no mathematical derivation). Impossibility of TEM mode in a wave guide. Field configuration of TE_{10}, TE20 and TM_{11} modes.

Constructional features, characteristics and application of tees, bends, matched termination, twists, detector, mount, slotted section, directional coupler, fixed and variable attenuator, isolator, circulator and duplex, coaxial to wave guide adapter.

UNIT-III

Microwave Communication systems

Block diagram and working principles of microwave communication link.Troposcatter

Communication: Troposphere and its properties, Tropospheric duct formation and propagation, Troposcatter propagation.

UNIT-IV

Radar Systems

Introduction to radar, its various applications, radar range equation (no derivation) and its applications.

Block diagram and operating principles of basic pulse radar. Concepts of ambiguous range, radar area of cross-section and its dependence on frequency. Block diagram and operating principles of CW (Doppler) and FMCW radars, and their applications. Block diagram and operating principles of MTI radar. Radar display- PPI

UNIT-V

Satellite communications and Microwave antennas:

Basic idea, passive and active satellites, Meaning of the terms; orbit, apogee, perigee, Geo-stationary satellite and its need. Block diagram and explanation of a satellite communication link. Microwave antennas, Structure characteristics and typical applications of Horn and Dish antennas.

Course outcome

After completing this course Students will be

CO1: Able to understand the concept of Gunn diode

CO2:Able to understand the concept of PIN diode.

CO3: Able to understand the concept of radar

CO4: Able to understand the concept of echo signal

RECOMMENDED BOOKS

1. Microwave Communication by Wheeler
2. Microwave Communication by Samuel y Liao
3. Radar Systems by Skolnik
4. Communication Systems by Kennedy

NOTE FOR PAPER SETTER: The question paper shall comprise of 80 marks. Two questions will be set from each unit; the student has to attempt five questions, at least one from each unit.

Department of Electronics & Communication Engineering
SEMESTER-VI

Course Title: Wireless and Mobile Communication
Course code: ECE-602
L T P
4 0 0

Max.Marks: 100
External: 60
Internal Assessments: 40
Duration of exam: 3 Hrs

UNIT-I
Introduction to Digital Communication / Mobile Communication.
Digital Modulation Techniques: Basic block diagram and principle of working of the following: Amplitude shift keying (ASK); Interrupted continuous wave (ICW), two tone modulation. Frequency shift keying (FSK), Phase shift keying (PSK).
Mobile Communication Systems: Mobile communication systems: Two way mobile radio – cordless telephone – Cellular radio – Analog and Digital systems standards – Personal Communication systems (PCS) and Mobile personal Computers MPC – One way mobile.

UNIT-II
Radio Propagation
Radio Propagation Concepts: Fundamentals of radio propagation and system concepts – causes for prorogation path loss – fading – Doppler spread – time delay path loss – foliage loss – path loss measurement from point to point prediction model.

UNIT-III
Frequency Management.
Frequency management – Frequency bands for mobile communication – frequency reuse techniques – FDMA. TDMA and CDMA techniques.-Comparison between GSM and CDMA.

UNIT-IV
Radio Interference
Mobile radio interference: Noise limited and interference limited environment – co-channel and adjacent channel environment – inter-modulation – Near –end and far-end ratio.

UNIT-V
Design Parameters
Design parameters: Design characteristic at base station and mobile unit- Mobile communication satellites – Mobile communication satellites at Geo-synchronous orbits – IRIDIUM satellites-ODYSSEY satellites.

Course outcome

After completing this course Students will be

CO1: Able to identify the most important components and functions of a mobile communication system in physical, link and network layer.

CO2: Able to explain & compare the differences in characteristics between different types of mobile communication systems and areas of applications for different mobile communication systems.

CO3: Able to define & calculate the trade-offs & key performance metrics between different mobile communication technologies & Systems.

CO4: Able to apply previous knowledge from statistics, modelling, programming and data/telecommunications in the area of mobile communications.

CO5: Able to independently plan, perform and document a research oriented project in the area of mobile communications.

RECOMMENDED BOOKS:

1. William C.Y.Lee: Mobile Cellular Telecommunications Analog and Digital Systems, 2nd Edition, McGrawHill, 1995.
2. Kamilo Fether: Wireless digital communication modulation and spread spectrum applications-Prentice Hall, 1995.
3. Tom Logsdom: Mobile communication satellites theory and applications – McGraw Hill, 1995.
4. William C.Y.Lee: Mobile Communication Design Fundamentals – McGraw Hill, 1993.
5. To Generate ASK and demodulate it.
6. To generate FSK and develop it.

NOTE FOR PAPER SETTER: The question paper shall comprise of 80 marks. Two questions will be set from each unit; the student has to attempt five questions, at least one from each unit.

Department of Electronics & Communication Engineering

SEMESTER-VI

Course Title: Microcontrollers and Embedded System	Max.Marks: 100
Course code: ECE-603	External: 60
L T P	Internal Assessments: 40
4 0 0	Duration of exam: 3 Hrs

Objective:

Embedded systems and Micro-controllers have also assumed a great significance in the electronic and consumer goods industry and are a very vital field. The subject aims expose students to the embedded systems besides giving them adequate knowledge of Micro controllers.

UNIT-I

Microcontroller Series (MCS) – 51 Overview

Architecture of 8051/8031 Microcontroller:

Pin details, I/O Port structure, Memory Organization, Special Function Registers (SFRs), External Memory

UNIT-II

Instruction Set; Addressing Modes, Instruction types

Timer operation, Serial Port operation, interrupts

UNIT-III

Assembly language programming

Assembler directives, Assembler operation

UNIT-IV

Design and Interface

Examples like: keypad interface, 7- segment interface etc

UNIT-V

Embedded systems

Introduction and Applications of Embedded systems

Course outcome

After completing this course Students will be

CO1: Able to understand 8051 pin configuration

CO2: Able to understand the architecture.

CO3: Able to understand the instruction set.

CO4: Able to make the small programs.

CO5 :Able to interface 8051 etc.

RECOMMENDED BOOKS:

1. Microcontrollers by Ayala
2. Microcontrollers by Mazidi
3 Microcontrollers by Neil Makanzie
4. Micrcontrollers by Deshmukh

NOTE FOR PAPER SETTER: The question paper shall comprise of 80 marks. Two questions will be set from each unit; the student has to attempt five questions, at least one from each unit.

Department of Electronics & Communication Engineering
SEMESTER-VI

Course Title: Digital Signal Processing
Course Code: ECE-604
L T P
4 0 0

Max.Marks: 100
External: 60
Internal Assessments: 40
Duration of exam: 3 Hrs

Objective
Digital signal processing (DSP) is an emerging area, which has a great scope and a lot of job potential in the industry. DSP chips are being widely used in communication industry, consumer electronics etc.

UNIT-I
Introduction
Signal systems Basic elements of a digital signal processing system. Classification of signals, continuous time versus discrete time signals
Concept of frequency in continuous time and discrete time signals

UNIT-II
Discrete time signals and systems:
Block diagram representation of discrete time systems, Linearity, Stability and Causality. Convolution and correlation of signals.
Implementation of discrete time systems, Recursive and non-recursive FIR systems

UNIT-III
Z-transform:
Z transform and its application to LTI systems: Direct and inverse Z transform, properties of Z transform.

UNIT-IV
Design and application of Filters
Design of Filter structures-Direct Form I, II, cascade and Parallel form
Introduction to IIR and FIR filters, Application of DSP baffles system

UNIT-V
Introduction to Fourier Transform and Fast Fourier Transform
Discrete Fourier transforms properties of DFT (No proof), Multiplication of time DPTS and circular convolution, and use of DFT in linear filtering, Fast Fourier transforms: Efficient computation of DFT; FFT, DIT algorithm

Course Outcome:
CO1:To understand the concept of Digital signals processing.
CO2: To make the student familiar with the analysis of digital signal and systems.
CO3: To study the various operation performed on digital systems

RECOMMENDED BOOKS

1. Theory and Applications of Digital Signal Processing by Rabiner and Gold; Prentice Hall of India
2 Digital Signal Processing Using MATLAB by Vinay K Ingle and John G Proakis; Vikas Publishing House, New Delhi
3 Digital Signal Processing (Principles, Algorithms and Applications) by John G. Proakis and G Monolakis; Prentice Hall of India
4. Digital Signal Processing by AV Oppenheim and RW Ronald W Schafer; Prentice Hall of India
5. DSP a computer based approach Mitra Sanjit TMH Publication
6. DSP a Practical approach by Ifeachor, Emmanual Pearson Education.

NOTE FOR PAPER SETTER: The question paper shall comprise of 80 marks. Two questions will be set from each unit; the student has to attempt five questions, at least one from each unit.

Department of Electronics & Communication Engineering
SEMESTER-VI

Course Title: Basics of Management	Max. Marks: 100
Course Code: CE/EE/ME/ECE -605	External: 60
L T P	Internal Assessment: 40
4 0 0	Duration of Exam: 3Hrs

Objective

The diploma holders are generally expected to take up middle level managerial positions, their exposure to basic management principles is very essential. Topics like Structure of Organization, Leadership, Motivation, Ethics and Values, Customer Relationship Management (CRM), Legal Aspects of Business, Total Quality Management (TQM), Intellectual Property Rights (IPR) etc. have been included in the subject to provide elementary knowledge about these management areas.

UNIT- I

Principles of Management

Introduction, definition and importance of management.

Functions of Management: Planning, Organizing, Staffing, Coordinating, Directing, Motivating and Controlling

Concept and Structure of an organization

Types of industrial organization

a) Line organization
b) Functional organization
c) Line and Functional organization

Hierarchical Management Structure: Top, middle and lower level management

Departmentalization: Introduction and its advantages.

UNIT- II

Leadership and Motivation

Leadership

a) Definition and Need of Leadership
b) Qualities of a good leader
c) Manager vs. leader

Motivation

d) Definition and characteristics of motivation
e) Factors affecting motivation

f) Maslow's Need Hierarchy Theory of Motivation

Job Satisfaction

UNIT -III

Introduction and need of Legal Aspects of Business and Work Culture:

Labour Welfare Schemes

a) Wage payment : Definition and types
b) Incentives: Definition, need and types

Factory Act 1948

Minimum Wages Act 1948

Introduction and importance of Healthy Work Culture in organization

Components of Culture

Importance of attitude, values and behaviour

Behavioural Science – Individual and group behaviour

Professional ethics – Concept and need of Professional Ethics

UNIT –IV

Management Scope in different Areas

Human Resource Development

a) Introduction and objective
b) Manpower Planning, recruitment and selection
c) Performance appraisal methods

Material and Store Management

a) Introduction, functions and objectives of material management
b) Purchasing: definition and procedure
c) Just in time (JIT)

Marketing and Sales

a) Introduction, importance and its functions
b) Difference between marketing and selling
c) Advertisement- print media and electronic media
d) Market-Survey and Sales promotion.

Financial Management – Introduction

a) Concept of NPV, IRR, Cost-benefit analysis
b) Elementary knowledge of Income Tax, Sale Tax, Excise duty, Custom duty, Provident Fund

Maintenance Management

a) Concept
b) Preventive Maintenance

UNIT -V

Miscellaneous topics

Customer Relationship Management (CRM)

a) Definition and Need
b) Types of CRM
c) Customer satisfaction

Total Quality Management (TQM)

a) Inspection and Quality Control
b) Concept of Quality Assurance
c) TQM

Intellectual Property Rights (IPR)

a) Introduction, definition and its importance
b) Infringements related to patents, copyright, trade mark

INSTRUCTIONAL STRATEGY

It is observed that the diploma holders generally take up middle level managerial positions, therefore, their exposure to basic management principles is very essential. Accordingly students may be given conceptual understanding of different functions related to management. Some of the topics may be taught using question answer, assignment or seminar method. The teacher will discuss success stories and case studies with students, which in turn, will develop appropriate managerial qualities in the students. In addition, expert lectures may also be arranged from within the institutions or from management organizations. Appropriate extracted reading material and handouts may be provided.

Course Outcome:

CO1: To make them understand the middle level managerial skills.

CO2: To understand the basic management principles .

CO3: To understand the topics like Structure of Organization, Leadership, Motivation, Ethics and Values, Customer Relationship Management (CRM), Legal Aspects of Business, Total Quality Management (TQM), Intellectual Property Rights (IPR) etc. have been included in the subject to provide elementary knowledge about these management areas.

RECOMMENDED BOOKS

1. Principles of Management by Philip Kotler TEE Publication
2. Principles and Practice of Management by Shyamal Bannerjee: Oxford and IBM Publishing Co, New Delhi.
3. Financial Management by MY Khan and PK Jain, Tata McGraw Hill Publishing Co., 7, West Patel Nagar , New Delhi.
4. Modern Management Techniques by SL Goel: Deep and Deep Publications Pvt Limited , Rajouri Garden, New Delhi.
5. Management by James AF Stoner, R Edward Freeman and Daniel R Gilbert Jr. : Prentice Hall of India Pvt Ltd, New Delhi.
6. Essentials of Management by H Koontz, C O' Daniel , McGraw Hill Book Company, New Delhi.
7. Marketing Management by Philip Kotler, Prentice Hall of India, New Delhi

8. Total Quality Management by DD Sharma, Sultan Chand and Sons, New Delhi.
9. Intellectual Property Rights and the Law by Dr. GB Reddy.
10. Service Quality Standards, Sales & Marketing Department, Maruti Udyog Ltd.
11. Customer Relationship Management: A step-by-step approach, Mohamed & Sagadevan Oscar Publication, Delhi

NOTE FOR PAPER SETTER: The question paper shall comprise of 60 marks. Two questions will be set from each unit. The student has to attempt five questions, at least one from each unit

Department of Electronics & Communication Engineering
SEMESTER-VI

Course Title: Digital System Design
Course Code: ECE-604
L T P
4 0 0

Max.Marks: 100
External: 60
Internal Assessments: 40
Duration of exam: 3 Hrs

UNIT-I
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), 2 bit magnitude comparator, Code Convertors-5421 to 2421, 8421 to 5421, BCD adder Shift register, ROM Types of ROM, PLD-PAL and PLA, ROM/PLA design (LSI approach), Sequential programmable device-SPLD, CPLD and FPGA

UNIT-II
Sequential Circuits:
Essential components of a sequential circuit, synchronous and asynchronous sequential circuits. Classification of sequential circuits (Mealy & Moore Machines).
Flip-Flop as memory element: RS, D, JK (including master slave), T, their excitation and characteristic (Truth tables).

UNIT-III
Design of Sequential Circuits
Conversion of JK to D and T. Generation of primitive state table/ diagram. Its minimization of states, state assignment, choice of memory elements. Design of next state decoder, output decoder (SSI, MSI approach). Worked examples for sequential system design, Design of counter(synchronous) using JK flip flop-Modulo -5,modulo-6,modulo -10 etc, Design of counter using D flip flop and T flip flop.

UNIT-IV
Asynchronous Finite State Machine Analysis: Design and Issues
Need for asynchronous Circuits, Spikes in output and their removal. Design approach to asynchronous circuits, definitions of cycles races -plotting and reading the excitation map- hazards –map approach to asynchronous design-Contemporary approach to asynchronous Design- Hazard in the circuit developed by MEV method.

UNIT-V
HDL Language:
Introduction to HDL-verilog Language. Different modeling techniques-Gate Level modeling, Data Flow modeling and Behavioral modeling, simple Problems on HDL language-full adder, multiplexer, half adder, half subtractor, full subtractor, demultiplexer.

Course outcome

After completing this course Students will be

CO1: Able to find DFT of a given signal through Fast Fourier Transform Techniques.

CO2: Able to design FIR and IIR type digital filters.

CO3: Able to identify filter structures and evaluate the coefficient quantization effects.

CO4: Able to understand sample rate conversion techniques.

CO5: Able to compare the architectures of DSP and General Purpose Processors

REFERENCE BOOKS

1. Digital System Design And Microprocessors By Hayes, John TMH Publication
2. Digital Systems, Hardware Organization And Design By Hill, Fedrick Willey Publication
3. Digital System Design Using Vhdl By Roth,Charles H Books/Thomson Learning
4. Digital System,Principles And Application By Tocci, Ronald PHI Publication
5. Engineering Approach To Digital Design By Wiiliam Fletcher PHI Publication
6. Digital Design By Morris Mano
7. Digital Logic Design Principles By Norman Balabanian & Bradley Carlson
8. Modern Digital Electronics By R.P. Jain

NOTE FOR PAPER SETTER: The question paper shall comprise of 80 marks. Two questions will be set from each unit; the student has to attempt five questions, at least one from each unit.

Department of Electronics & Communication Engineering
SEMESTER-VI

Course Title: Wireless and Mobile Communication -Lab
Course Code: ECE-611
L T P
0 0 2

Max.Marks: 50
External: 25
Internal Assessments: 25
Duration of exam: 3 Hrs

LIST OF PRACTICALS

1. Study the features of cordless telephone.

2. Study the features of cellular Mobile.

3. Troubleshooting of cordless telephone.

4. Troubleshooting of cellular mobile.

5. Add experiments to make list of 8-10 experiments

Course Outcome:

Students will be able to :
CO1: Understand the basics working principle of cellular, cordless and landline phones.
CO2: Analyse the various faults in cellular , cordless and landline phones.
CO3: Able to perform the troubleshooting of these devices**.**

Department of Electronics & Communication Engineering
SEMESTER-VI

Course Title: Microcontrollers and Embedded System -Lab
Course Code: ECE-612
L T P
0 0 2

Max.Marks: 50
External: 25
Internal Assessments: 25
Duration of exam: 3 Hrs

LIST OF PRACTICALS

1. Familiarization with Micro-Controller Kit
2. Assembly Language Programming
3. Use of Assembler for making program
4. Interfacing of key Board and 7 Segment Display with Micro Controller PLCs

Course Outcome:
Students will be
CO1: Able to make small projects on 8051.
CO2:Able to interface 8051
CO3: able to make small programs.
CO4: Able to get the output.

Department of Electronics & Communication Engineering
SEMESTER VI

Course Title: Digital Signal Processing -Lab
Course Code: ECE-613
L T P
0 0 2

Max. Marks: 50
External: 25
Internal Assessments: 25
Duration of exam: 3 Hrs

LIST OF PRACTICALS

1. Plotting of different Discrete Signals using MATLAB
2. Convolution using Mat Lab or C program
3. Correlation using Mat Lab or C program
4. Divide and conquer Mat Lab or C program
5. Introduction to ADSP 21 XX DSP Chip
6. Demo programs of ADSP 21 XX
7. Building and Simulations small programs (5 programs) using 21 XX simulator

Students will have the
CO1: Ability to analyze sampled Sinusoidal signal, various sequences and different arithmetic operations, convolution properties of convolution, circular convolution, differentiation between linear and circular convolutions, sectioned convolution.
CO2: Understand and analyze z-transform of various sequences - verification of the properties.
CO3: Acquired knowledge of Twiddle factors, DFT, FFT, and IDFT.
CO4: Ability to design of Butterworth Filter design with different set of design parameters, using Rectangular, Hamming, Hamming, Bartlett windows and comparisons of these designs.
CO5: Acquired knowledge of Hardware Laboratory using DSP Processors.

Department of Electronics & Communication Engineering
SEMESTER-VI

Course Title: Major Project Work (Industry oriented –Practice based) Max.Marks: 200
Course Code: ECE-614 External: 100
L T P Internal Assessments: 100
0 0 10 Duration of exam: 3 Hrs

Each teacher is expected to guide the project work of 4-5 students at a time. The project assignments may consist of:

- Projects related to designing small electronic equipment / instruments.
- Projects related to increasing productivity in electronic manufacturing areas.
- Projects related to quality assurance.
- Projects connected with repair and maintenance of plant and equipment.
- Projects related to design of PCBs.
- Projects related to suggesting substitutes of electronics components being used.
- Projects related to design of small oscillators and amplifier circuits.
  Projects related to design, fabrication, testing and application of simple digital circuits and components.
- Projects related to microprocessor based circuits/ instruments.

Some of the projects based on above areas are listed below for the benefit of students:

1. Microprocessor based rolling display/bell and calendar
2. Microprocessor based stepper motor control.
3. Speed control of DC Machines by Microprocessors.
4. Temperature monitoring using microprocessor based systems.
5. Microprocessor based liquid level indicator and control/solar tracking system
6. Fabrication and assembling of digital clock.
7. Design and fabrication of timing circuits using 555 and counters.
8. Design and fabrication of amplifiers and oscillators circuits.
9. Fabrication of demonstration type Radio receiver

10. Fabrication of PCB circuits using ORCAD/ Fagu Software.
11. Fabrication of ON line/OFF line UPS of different ratings and inverters
12. Design, fabrication and testing of different types of experimental boards as per the curriculum of Electronics and Communication Engineering.
13. Repair of X-Ray Machines, ECG, EEG, EMG, Calorimeter and Centrifuge etc.
14. Repair and fault location of telephone exchanges and intercom system.
15. Repair of oscilloscope, function generator, Power supply
16. Design and developing web sites of organizations
17. Installation of computer network (LANS).
18. Microprocessor based solar tracking system
19. Car or home security system
20 Bank token display
21. Printer sharing unit
22. Caller Identification unit for phone
23. LCR-Q meter and frequency meter
24. µP-Based A/D converter
25. µP-Based D/A converter
26. Simulation of half wave and full wave rectifiers using ORCAD
27. Simulation of following circuits:

    Integrator, differentiator, adder, subtractor, V-I converter comparator etc. using Op- Amps.
28. Simulation of class A, Class B, Class AB and Class C amplifiers
29. Simulation of different wave forms like sine, square, triangular waves etc.

Course Outcome:

CO1: Able to solve the real world problems
CO2:Able to understand the concepts of design methodologies & its implementation
CO3: Able to implement the testing methodologies.
CO4: Able write a Technical report
CO5: Able to increase exposure to industries.
CO6: Able to be accustomed with working environment in industries.
CO7: Able to get the opportunity to work with live projects

Department of Electronics & Communication Engineering
SEMESTER-VI

Course Title: Student Centred Activities
Course Code: ECE-614
L T P
0 0 4

Max. Marks: 50
Internal Assessment: 50

SCA will comprise of co-curricular activities like extension lectures, library studies, games, hobby clubs e.g. photography, painting, singing, seminars, declamation contests, educational field visits, N.C.C., NSS, Cultural Activities, Civil Defence/ Disaster Management activities etc.