

KARANATAKA STATE OPEN UNIVERSITY

DIPLOMA IN ELECTRONICS AND
TELECOMMUNICATION ENGINEERING

SEMESTER SYSTEM

SYLLABUS

**I YEAR SYLLBUS Basic Engineering
(Common to all Branches)**

Subject Code	Subject Title	Max Marks	Max Credits
Semester-I			
BE101	Communication English	100	4
BE102	Applied Mathematics-1	100	4
BE103	Engineering Physics-I	100	4
BE104	Engineering Chemistry-I	100	4
BE105	Computer Application Lab	100	2
BE106	Workshop Practice Lab	100	2
Semester -II			
BE201	Applied Mathematics-II	100	4
BE202	Engineering Physics-II	100	4
BE203	Engineering Chemistry-II	100	4
BE204	Engineering Graphics	100	4
BE205	Physics Lab	100	2
BE206	Chemistry Lab	100	2

**Electronics and Telecommunication Engineering
III Semester**

Subject Code	Subject Title	Max Marks	Max Credits
EC301	Electrical Circuits and Instrumentation	100	4
EC302	Electronic Devices	100	4
EC303	C Programming	100	4
EC304	Microprocessor	100	4
EC305	Electronic Devices Lab	100	2
EC306	Electrical Circuits and Instrumentation Lab	100	2

**Electronics and Telecommunication Engineering
IV Semester**

Subject Code	Subject Title	Max Marks	Max Credits
EC401	Linear and Digital ICs	100	4
EC402	Computer Hardware and Networking	100	4
EC403	Industrial Electronics	100	4
EC404	Object Oriented Programming	100	4
EC405	IC Lab	100	2
EC406	Industrial Electronics Lab	100	2

**Electronics and Telecommunication Engineering
V Semester**

Subject Code	Subject Title	Max Marks	Max Credits
EC501	VLSI	100	4
EC502	Microcontrollers	100	4
EC503	Communication Engineering - I	100	4
EC504	Robotics	100	4
EC505	VLSI Lab	100	2
EC506	Communication Engineering – I Lab	100	2

**Electronics and Telecommunication Engineering
VI Semester**

Subject Code	Subject Title	Max Marks	Max Credits
EC601	Embedded Systems	100	4
EC602	Communication Engineering – II	100	4
EC603	Television Engineering	100	4
EC604	Embedded Systems Lab	100	2
EC605	Project	400	8

Total Marks = 3800

Total Credits = 122

SEMESTER : I
Subject Code : BE 101
Subject Title : Communication English

Structure of the Course Content

BLOCK 1 Grammar (Non-Textual)

- Unit 1: Functional Analysis
- Unit 2: Voice and parts of speech
- Unit 3: Direct and indirect speech
- Unit 4: Preposition

BLOCK 2 Grammars

- Unit 1: One word substitute
- Unit 2: Articles and question tags
- Unit 3: Prefixes and suffixes
- Unit 4: Tenses

BLOCK 3 Compositions

- Unit 1: Comprehension
- Unit 2: Simple passage
- Unit 3: Moral story
- Unit 4: Science and technology

BLOCK 4 Letter and dialogue Writing

- Unit 1: Letter writing - personal
- Unit 2: Letter writing - official
- Unit 3: Dialogue writing
- Unit 4: Hints development

BLOCK 5 Proses

- Unit 1: An Astrloger's day – R.K. Narayanan
- Unit 2: The sun, the planets and the stars – C.Jones
- Unit 3: The continuing spell of Ramanujam
- Unit 4: On saying 'please' – A.G.Gardiner

Books:

1. Orient Longman, Anna Salai, Chennai-600002.
2. The Advanced Learners Dictionary of Current English by A.S.Hornby, Oxford University Press. 1973
3. High School English Grammar and Composition by Wren & Martin, S.Chand & Co Ltd., 2005
4. Vocabulary in Practice - Part 1 to 4 by Glennis Pye, Cambridge University Press,
5. Learn Correct English by Shiv K. Kumar & Hemalatha Nagarajan, Pearson Longman, 2005
6. Essential English Grammar by Raymond Murphy, Cambridge University Press,
7. Common Errors in English by M.Thomas, Lotus Press, New Delhi, 2006
8. Basic English Usage by Michael Swan, ELBS/OUP, 1989
9. Communication Skills for Engineers by Mishra, Ist Edition, Pearson Longman
10. Basic English Dictionary by Longman Longman Ist Edition, Pearson Longman

SEMESTER : I
Subject Code : BE 102
Subject Title : Applied Mathematics - I

Structure of the Course Content

BLOCK 1 Algebra

- Unit 1: Determinants
- Unit 2: Matrices
- Unit 3: Permutation and combination
- Unit 4: Binomial Theorem

BLOCK 2 Complex numbers

- Unit 1: Real and imaginary parts
- Unit 2: Demoivre's Theorem
- Unit 3: Finding the n^{th} roots of unity
- Unit 4: Solving equations

BLOCK 3 Analytical geometry

- Unit 1: Pair of straight lines
- Unit 2: Circles
- Unit 3: Family of circles
- Unit 4: Concentric circles

BLOCK 4 Trigonometry

- Unit 1: Compound angles
- Unit 2: Multiple angles
- Unit 3: Sub multiple angles
- Unit 4: Sum and product formulae

BLOCK 5 Differential calculus

- Unit 1: Limits
- Unit 2: Differentiation
- Unit 3: Differentiation methods
- Unit 4: Successive differentiation

Books :

1. Engineering Mathematics by Dr M.K.Venkatraman, National Publishing Co.
2. Engineering Mathematics by Dr P.Kandasamy, S.Chand & Co, New Delhi
3. Higher Engineering Mathematics by Ramana, Tata McGraw Hill, New Delhi
4. Engineering Mathematics by Singh, Tata McGraw Hill, New Delhi
5. Advanced Engineering Mathematics by N.Bali,M.Goyal,C.Watkins,Lakshmi Publications (Pvt) Ltd, New Delhi
6. Engineering Maths by T.Veerarajan, Tata McGraw Hill, New Delhi
7. Schaum's Outline of Technical Mathematics by Paul Calter, Tata McGraw Hill, New Delhi
8. Engineering Mathematics Vol-III by Dr. B. Krishna Gandhi , Dr. T.K.V Iyengar, S.Ranganatham, , S.Chand & Co, New Delhi
9. Introduction to Engineering Mathematics by H.K. Dass, Dr.Rama Verma, S.Chand & Co, New Delhi
10. Applied Engineering Mathematics Vol-II by H.K.Dass, S.Chand & Co

SEMESTER : I
Subject Code : BE 103
Subject Title : Engineering Physics - I

Structure of the Course Content

BLOCK 1 S I units and Statics

- Unit 1: Fundamental quantities
- Unit 2: Derived quantities
- Unit 3: Concurrent forces
- Unit 4: parallelogram Law of forces

BLOCK 2 Properties of matter

- Unit 1: Stress and strain
- Unit 2: Young's modulus
- Unit 3: Viscosity
- Unit 4: Surface Tension

BLOCK 3 Dynamics

- Unit 1: Projectile Motion
- Unit 2: Angle of projection
- Unit 3: Circular Motion
- Unit 4: Application of circular motion

BLOCK 4 Rotational motions of rigidity bodies

- Unit 1: Moment of Inertia
- Unit 2: Kinetic energy
- Unit 3: Angular Momentum
- Unit 4: Kepler's Law

BLOCK 5 Remote sensing and sound

- Unit 1: Active and Passive remote sensing
- Unit 2: Microwave remote sensing
- Unit 3: Types of sound waves
- Unit 4: Acoustics

Books :

1. Physics by Resnick and Hoilday ,Wisley Toppan Publishers – England
2. Mechanics by Narayana Kurup , S. Chand Publishers – New Delhi
3. Engineering Physics by B.L. Theraja , S. Chand Publishers – New Delhi
4. Remote sensing by Dr.M.Anji Reddy, Jawaharlal Nehru Technological University –Hyderabad.
5. Engineering Physics by V.Rajendran, Tata McGraw Hill, New Delhi
6. Engineering Physics by Vikram Yadav, Tata McGraw Hill, New Delhi
7. Schaum's Outline of Physics for Engineering and Science by Michael Browne, Tata McGraw Hill, New Delhi
8. Modern Engineering Physics by A.S.Vasudeva, S. Chand Publishers, New Delhi
9. Engineering Physics Fundamentals & Modern Applications by P.Khare and A.Swarup, Lakshmi Publications (Pvt) Ltd, New Delhi
10. Engineering Physics by Dipak Chandra Ghosh, Nipesh Chandra Ghosh, Prabir Kumar Haldar, Lakshmi Publications (Pvt) Ltd, New Delhi

SEMESTER : I
Subject Code : BE 104
Subject Title : Applied Chemistry - I

Structure of the Course Content

BLOCK 1 Acids – Bases, Catalysis

- Unit 1: Theories of Acids and Bases
- Unit 2: Industrial application
- Unit 3: Positive and Negative catalyst
- Unit 4: Characteristics of Catalyst

BLOCK 2 Pollution

- Unit 1: Air Pollution
- Unit 2: Global warming
- Unit 3: Water Pollution
- Unit 4: Green Chemistry

BLOCK 3 Electro chemistry and corrosion

- Unit 1: Types of conductors
- Unit 2: Industrial applications of Electrochemistry
- Unit 3: Electrochemical theory
- Unit 4: Electroplating

BLOCK 4 Organic coatings

- Unit 1: Paint
- Unit 2: Varnish
- Unit 3: Adhesives
- Unit 4: Lubricants

BLOCK 5 Colloids and Ceramics

- Unit 1: Colloidal solution
- Unit 2: Brownian movement
- Unit 3: Water purification
- Unit 4: Ceramics

Books :

1. Inorganic chemistry by Soni PL, Sultan Chand & sons.
2. Organic chemistry by Soni PL, Sultan Chand & sons.
3. Engineering chemistry by Jain & Jain, Dhanpat rai & co
4. Engineering chemistry by Uppal , Khanna publishers
5. Environmental chemistry & Pollution control by Dara .SS, S. Chand & co
6. Environmental Pollution by . Tripathy .SN , Sunakar panda - Vrinda publication
7. Rain water Harvesting-hand book by Chennai Metro Water
8. Introduction to Engineering Chemistry by Minaxi B Lohani, Upma Misra, S.Chand & Co, New Delhi
9. Engineering Chemistry by Dr.A.K.Pahari, Dr.B.S.Chauhan, Lakshmi Publications (Pvt) Ltd, New Delhi
10. Advanced Engineering Chemistry by M.Senapati, Lakshmi Publications (Pvt) Ltd, New Delhi

SEMESTER : I
Subject Code : BE 105
Subject Title : Computer Application Lab

Practicals Windows

- 1.a. Starting a program, running a program.
- b. Starting the Windows in safe mode
- c. Running multiple Programs and switching between windows.
- d. Moving the windows, and the task bar.
- e. Startup to MS-DOS prompts.
- 2.a. Creating and removing a folder.
- b. Making the taskbar wider, arranging icons on the Desktop.
- c. Displaying and hiding the taskbar clock.
- d. Controlling the size of start menu options.
- e. Creating shortcuts.
- 3.a. Installing a screen saver.
- b. Assigning Wallpaper to Desktop.
- c. Adding a program to the start menu.
- d. Recovering files and folders from Recycle bin.
- e. Customizing the mouse settings.
- 4 a. Expanding and collapsing a folder.
- b. Recognizing file types using icons.
- c. Running a program from explorer.
- d. Renaming a file or folder.
- e. Selecting two or more files for an operation.
- 5.a. Displaying the properties for a file or folder.
- b. Using cut and paste operations to copy a file.
- c. Using copy and paste operations to copy a file.
- d. Moving and copying files with mouse.
- e. Sorting a folder.
- 6.a. Finding a file or folder, by name.
- b. Defragmenting the disk using disk defragmenter.

- c. Compressing a file using WinZip.
- d. Controlling the speaker volume.
- e. Recording and saving an audio file.

MS Word

- a. Prepare a newsletter with borders, two columns text, header and footer and a graphic image and spell check the document.
- b. Create a table to show the paradigm of the verb “eat” in all 12 tenses

Tense		Present	Past	Future
Simple	He	Eats	Ate	Will eat
	I	Eat	Ate	Will eat
	You/They	Eat	Ate	Will eat
Continuous	He	Is eating	Was eating	Will be eating
	I	Am eating	Was eating	Will be eating
	You/They	Are eating	Was eating	Will be eating
Perfect	He	Has eaten	Had eaten	Will have eaten
	I	Have eaten	Had eaten	Will have eaten
	You/They	Have eaten	Had eaten	Will have eaten
Perfect continuous	He	Has been eating	Had been eating	Will have been eating
	I	Have been eating	Had been eating	Will have been eating
	You/They	Have been eating	Had been eating	Will have been eating

- c. Prepare your Bio-data/Resume
- d. Do the mail merge operation for sending applications to many companies with your resume

MS EXCEL

1. Create a worksheet in Excel for a company:
 - a. Copy, Move and Merge the cells
 - b. Adding Comments
 - c. Adding, Deleting the cells, Rows and Columns
 - d. Hiding and Unhiding the columns, Rows and gridlines.
2. Using formula and functions prepare worksheet for storing subject marks of ten

students and perform the following:

- a. Calculate the student wise total and average
 - b. Calculate the subject wise total and average
 - c. Calculate the overall percentage and also individual percentage of the student.
3. Create Bar Graph and Pie Chart for various data

MS Power Point

- a. Create a simple presentation with atleast 5 slides to introduce your friend and include sounds in slides.
- b. Create a presentation with 5 slides for the essay Astrologer's Day by R.K Narayanan

Internet

- a. Creating an E-Mail account.
- b. Sending an E-Mail to a known Address
- c. Viewing an E-Mail received from your friend/relative.
- d. Printing an E-Mail received
- e. Use of Attachment Facility
- f. Use of Address Book Facility
- g. Use of Sent Folder
- h. Use of Save Draft Folder
- i. Use of Trash Folder
- j. Browse a given web-site address.
- k. Search a Particular topic through a Search engine.

SEMESTER : I
Subject Code : BE 106
Subject Title : Workshop Practice

Fitting

1. Fitting
2. V - Joint
3. L - Joint
4. T - Joint
5. Half round joint
6. Dovetail Joint
7. U – Joint
8. Hexagonal – Joint
9. Step - Joint
10. Drilling and Tapping M8
11. Drilling and Tapping M10

Wiring

1. Single lamp controlled by single switch.
2. Two Lamps controlled by Two independent switches.
3. Stair case Wiring
4. Fluorescent lamp circuit.
5. Circuit diagram of a fan
6. Circuit diagram of an iron box
7. Circuit diagram of a mixie
8. Soldering practice

Sheet Metal

1. Hemming
2. Seaming
3. Tray
4. Cylinder
5. Cone
6. Hopper
7. Dust Pan
8. Funnel

SEMESTER : II
Subject Code : BE 201
Subject Title : Applied Mathematics - II

Structure of the Course Content

BLOCK 1 Vector Algebra

- Unit 1: Introduction
- Unit 2: Vector Properties
- Unit 3: Product of Vectors
- Unit 4: Application of Vectors

BLOCK 2 Integral Calculus

- Unit 1: Integration
- Unit 2: Standard Integrals
- Unit 3: Integration by parts
- Unit 4: Bernoulli's Theorem and Applications

BLOCK 3 Differentiation

- Unit 1: Velocity and Acceleration
- Unit 2: Tangents and Normals
- Unit 3: Maxima and Minima
- Unit 4: Partial differentiation

BLOCK 4 Application of Integration

- Unit 1: Definite Integral.
- Unit 2: Area and Volume
- Unit 3: Solution of differential equations
- Unit 4: Second order differential equation with constant coefficients

BLOCK 5 Probability Distributions

- Unit 1: Continuous random variable
- Unit 2: Discrete random variable
- Unit 3: Discrete Distributions (Binomial, Poisson)
- Unit 4: Continuous Distribution

Books :

1. Engineering Mathematics by Dr M.K.Venkatraman, National Publishing Co.
2. Engineering Mathematics by Dr P.Kandasamy, S.Chand & Co, New Delhi
3. Higher Engineering Mathematics by Ramana, Tata McGraw Hill, New Delhi
4. Engineering Mathematics by Singh, Tata McGraw Hill, New Delhi
5. Advanced Engineering Mathematics by N.Bali,M.Goyal,C.Watkins,Lakshmi Publications (Pvt) Ltd, New Delhi
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7. Schaum's Outline of Technical Mathematics by Paul Calter, Tata McGraw Hill, New Delhi
8. Engineering Mathematics Vol-III by Dr. B. Krishna Gandhi , Dr. T.K.V Iyengar, S.Ranganatham, , S.Chand & Co, New Delhi
9. Introduction to Engineering Mathematics by H.K. Dass, Dr.Rama Verma, S.Chand & Co, New Delhi
10. Applied Engineering Mathematics Vol-II by H.K.Dass, S.Chand & Co

SEMESTER : II
Subject Code : BE 202
Subject Title : Engineering Physics - II

Structure of the Course Content

BLOCK 1 Heat

- Unit 1: Heat - Kinetic Theory of Gases:
- Unit 2: Specific Heat
- Unit 3: Isothermal Changes
- Unit 4: Adiabatic Changes

BLOCK 2 Gases & Non Conversional Energy

- Unit 1: Liquefaction of Gases
- Unit 2: Joule Thomson Effect & Linde's process
- Unit 3: Renewable and Non-renewable sources
- Unit 4: Alternate sources of Energy-

BLOCK 3 Light & Magnetism

- Unit 1: Optical Instruments
- Unit 2: Lasers
- Unit 3: Basic definitions of Magnetism
- Unit 4: Hysteresis Loop

BLOCK 4 Electricity

- Unit 1: Basic laws
- Unit 2: Force on a moving charge
- Unit 3: Measuring Instruments
- Unit 4: Heating Effect of Electric Current

BLOCK 5 Dielectric effect & Electronics

- Unit 1: Chemical Effect of Electric Current
- Unit 2: Capacitor
- Unit 3: Semiconductors , PN Junction & Transistors
- Unit 4: Logic Gates

Books :

1. Physics by Resnick and Hoilday ,Wisley Toppan Publishers – England
2. Mechanics by Narayana Kurup , S. Chand Publishers – New Delhi
3. Engineering Physics by B.L. Theraja , S. Chand Publishers – New Delhi
4. Remote sensing by Dr.M.Anji Reddy, Jawaharlal Nehru Technological University –Hyderabad.
5. Engineering Physics by V.Rajendran, Tata McGraw Hill, New Delhi
6. Engineering Physics by Vikram Yadav, Tata McGraw Hill, New Delhi
7. Schaum's Outline of Physics for Engineering and Science by Michael Browne, Tata McGraw Hill, New Delhi
8. Modern Engineering Physics by A.S.Vasudeva, S. Chand Publishers, New Delhi
9. Engineering Physics Fundamentals & Modern Applications by P.Khare and A.Swarup, Lakshmi Publications (Pvt) Ltd, New Delhi
10. Engineering Physics by Dipak Chandra Ghosh, Nipesh Chandra Ghosh, Prabir Kumar Haldar, Lakshmi Publications (Pvt) Ltd, New Delhi

SEMESTER : II
Subject Code : BE 203
Subject Title : Applied Chemistry - II

Structure of the Course Content

BLOCK 1 Nuclear Chemistry

- Unit 1: Radio activity and definitions
- Unit 2: Half life period & Nuclear fission & fusion
- Unit 3: Applications of radioactive isotopes
- Unit 4: Abrasives

BLOCK 2 Fuels and Refractory's

- Unit 1: Fuels - classification
- Unit 2: Solid and Liquid Fuels
- Unit 3: Gas Fuels
- Unit 4: Refractory's

BLOCK 3 Water Treatment

- Unit 1: Water Treatment Methods
- Unit 2: EDTA Method
- Unit 3: Water -purification
- Unit 4: Lime and manufacturing process

BLOCK 4 Plastics and Rubber

- Unit 1: Thermoplastics,
- Unit 2: Thermo set plastics
- Unit 3: Natural rubber-
- Unit 4: Synthetic rubber

BLOCK 5 Metallurgy

- Unit 1: Tungsten & Titanium
- Unit 2: Powder metallurgy
- Unit 3: Purpose of alloying
- Unit 4: Non ferrous alloys

Books :

1. Inorganic chemistry by Soni PL, Sultan Chand & sons.
2. Organic chemistry by Soni PL, Sultan Chand & sons.
3. Engineering chemistry by Jain & Jain, Dhanpat rai & co
4. Engineering chemistry by Uppal , Khanna publishers
5. Environmental chemistry & Pollution control by Dara .SS, S. Chand & co
6. Environmental Pollution by . Tripathy .SN , Sunakar panda - Vrinda publication
7. Rain water Harvesting-hand book by Chennai Metro Water
8. Introduction to Engineering Chemistry by Minaxi B Lohani, Upma Misra, S.Chand & Co, New Delhi
9. Engineering Chemistry by Dr.A.K.Pahari, Dr.B.S.Chauhan, Lakshmi Publications (Pvt) Ltd, New Delhi
10. Advanced Engineering Chemistry by M.Senapati, Lakshmi Publications (Pvt) Ltd, New Delhi

SEMESTER : II
Subject Code : BE 204
Subject Title : Engineering Graphics

Structure of the Course Content

BLOCK 1 Drawing Office Practice

- Unit 1: Basics of Engg Drawing
- Unit 2: Dimensioning
- Unit 3: Scales
- Unit 4: Geometrical Constructions, conics and geometrical curves

BLOCK 2 Projection

- Unit 1: Orthographic Projection
- Unit 2: Projection of simple solids
- Unit 3: Section of Solids
- Unit 4: Half & Full Sectioning

BLOCK 3 Pictorial drawings

- Unit 1: Introduction
- Unit 2: Isometric Drawings
- Unit 3: Conversion of orthographic views

BLOCK 4 Development of Surfaces:

- Unit 1: Cube, Cylinder
- Unit 2: Prism
- Unit 3: Pyramids
- Unit 4: Tee and Elbow

BLOCK 5 AutoCAD

- Unit 1: Introduction
- Unit 2: AutoCAD commands
- Unit 3: Drawing -line, circle, arc, polygon,
- Unit 4: Drawing - ellipse, rectangle

Books :

1. Engineering Drawing by Gopalakrishnan.K.R., (Vol.I and Vol.II), Dhanalakshmi publishers, Edition 2, 1970
2. First Year Engineering Drawing by Barkinson & Sinha, Pitman Publishers, London, Edition 3, 1961
3. A Book on AutoCAD Release 2007.
4. Engineering Drawing by Shah/Rana, 1st Edition Pearson Longman
5. Machine Drawing with AutoCAD by Pohit/Ghosh, 1st Edition Pearson Longman
6. Engineering Graphics by Prof.P.J.Shah, S.Chand & Co, New Delhi
7. Computer Graphics including CAD,AUTOCAD &C by A.M.Kuthe, S.Chand & Co, New Delhi
8. Engineering Graphics by Dhawan R.K, S.Chand & Co, New Delhi
9. Auto CAD 2005 for Engineers by Ionel Simon, Lakshmi Publications (Pvt) Ltd, New Delhi
10. Engineering Drawing by Agrawal, Tata McGraw Hill, New Delhi

Drawing Practices

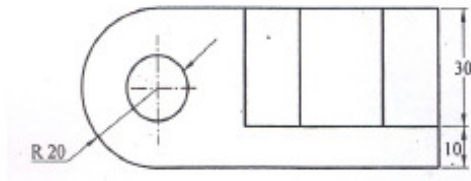


Fig - 1

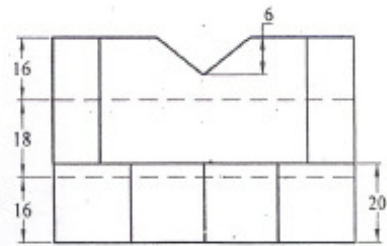


Fig- 2

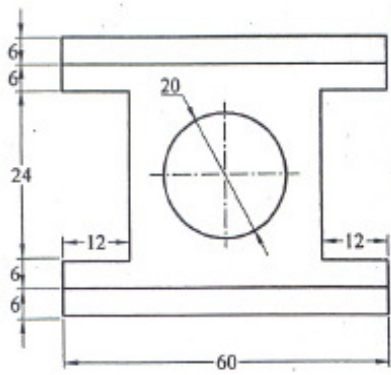


Fig. 3

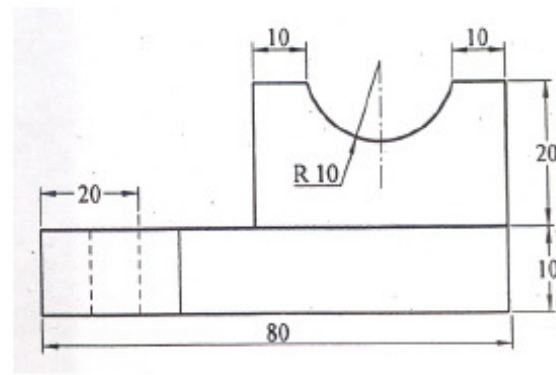


Fig. 4

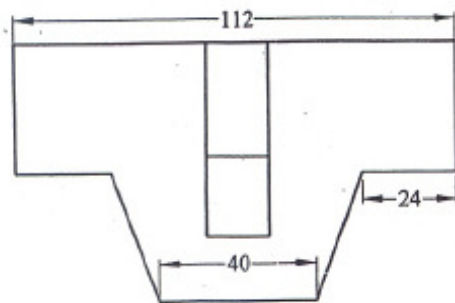


Fig. 5

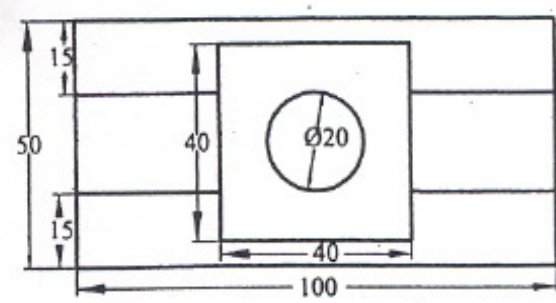


Fig. 6

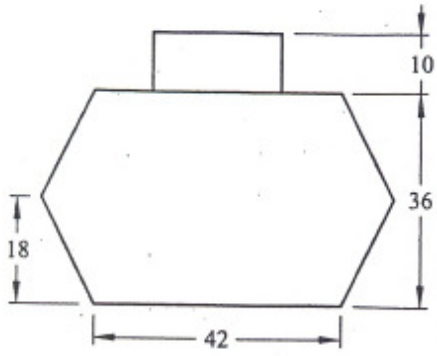


Fig. 7

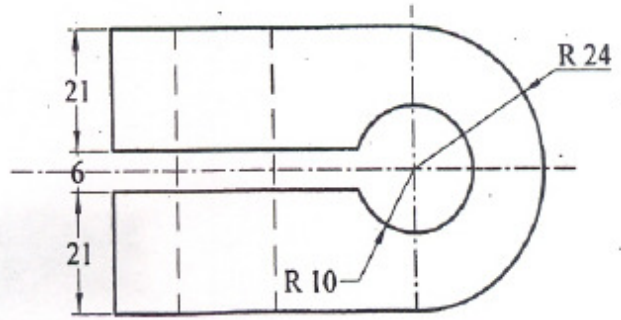


Fig. 8

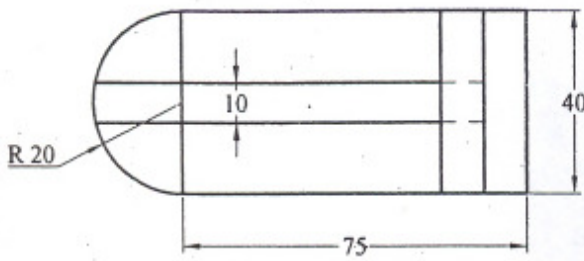


Fig. 9

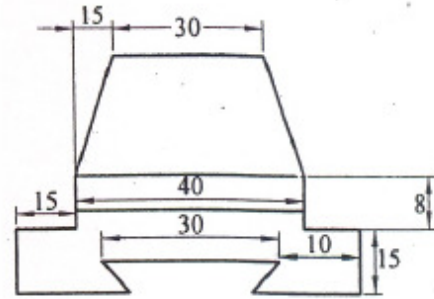


Fig. 10

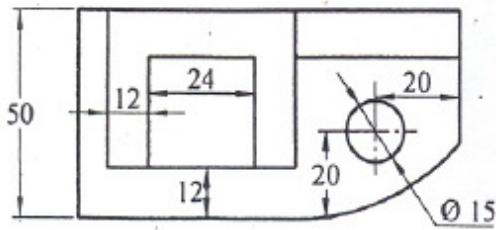


Fig.11

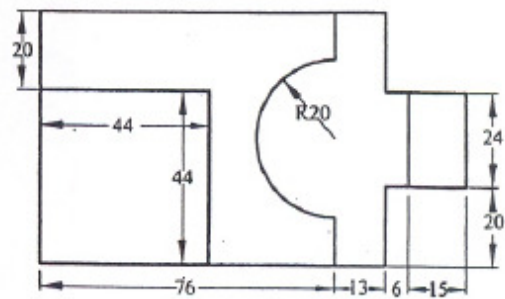


Fig. 12

SEMESTER : II

Subject Code : BE 205

Subject Title : Engineering Physics Lab

List of Experiments

1 VERNIER CALIPERS - To find the volumes of the solid cylinder and hollow cylinder using vernier callipers.

2 SCREW GAUGE – To find the thickness of (a) glass plate (b) given sphere using screw gauge. Hence calculate the volume of the glass plate and the sphere.

3 SIMPLE PENDULUM – To find the acceleration due to gravity in the laboratory, using simple pendulum. Calculate the acceleration due to gravity, by $L-T^2$ graph.

4 CONCURRENT FORCES -To verify the parallelogram law of forces and Lami's theorem.

5 COPLANAR – PARALLEL FORCES – To verify the conditions of the Co-planar parallel forces.

6 TORSION PENDULUM – To find the rigidity modulus of the thin wire and moment of inertia of the disc by using symmetric masses.

7 COMPARISON OF VISCOSITIES – To compare the coefficient of viscosities of two liquids by capillary flow method.

8 VISCOSITY OF A HIGHLY VISCOUS LIQUID – To find the coefficient of viscosity of a highly viscous liquid.

9 SURFACE TENSION: To find the surface tension of the given liquid by capillary

rise method

10 YOUNG'S MODULUS – To find the young's modulus of the material of the given metre scale.

11 SPECTROMETER – 1. To find the angle of the prism.

12 SPECTROMETER – 2. To find the refractive index of the material of the prism.

13 DEFLECTION MAGNETOMETER – To compare the magnetic moments of two given magnets by (a) Equal distance method and (b) Null method.

14 SONO METER – To find the frequency of the given tuning fork.

15 JOULE'S CALORIMETER – To determine the specific heat capacity of the given liquid.

16 COPPER VOLTAMETER – To determine electro – chemical – equivalent of copper.

17 OHM'S LAW – To determine the resistance of two given coils of wire using Ohm's law. Also verify the laws of resistances.

18 POTENTIO METER – To compare the e.m.fs of two given cells.

19 PN JUNCTION DIODE – For the given semiconductor diode draw (a) Forward bias (b) Reverse bias characteristic curves.

20 SOLAR CELLS – V. I. Characteristics.

SEMESTER : II

Subject Code : BE 206

Subject Title : Applied Chemistry Lab

List of Experiments

1. Qualitative Analysis

Acid radicals : Chloride, Carbonate, Sulphate, Nitrate

Basic radicals: Lead, Cadmium, Copper, Aluminium, Zinc, Calcium, Magnesium, Ammonium

Identification of acid and basic radicals in

1. Lime Stone (Calcium Carbonate)
2. Pollutant (Lead nitrate or Cadmium Carbonate)
3. Fertilizer (Ammonium sulphate)
4. Electrolyte (Ammonium Chloride)
5. Fungicide (Copper sulphate)
6. Coagulant (Aluminium Sulphate)
7. Mordant (Zinc Sulphate)
8. Gypsum (Calcium Sulphate)
9. Epsom (Magnesium Sulphate)
10. Analysis of an Effluent (containing pollutants like Lead, Cadmium, Zinc, and Copper). Students may be given above four pollutants, in four separate test tubes in solution form and asked to report metallic pollutants with procedure (Basic Radical Analysis Procedure) and their harmful effects.

2. VOLUMETRIC ANALYSIS (DOUBLE TITRATIONS)

ACIDIMETRY AND ALKALIMETRY

1. Estimation of Hydrochloric acid
2. Estimation of Sodium Hydroxide
3. Estimation of Sodium Carbonate
4. Comparison of Strengths of two bases

PERMANGANIMETRY

5. Estimation of Ferrous Ammonium Sulphate
6. Estimation of Ferrous Sulphate
7. Comparison of Potassium Permanganate.

WATER ANALYSIS

8. Estimation of Total Hardness by EDTA method.
9. Calculation of pH of four sample solutions and calculation of H⁺ Ion concentration for a particular sample solution.

SEMESTER : II
Subject Code : EC301
Subject Title : ELECTRICAL CIRCUITS & INSTRUMENTATION

Structure of the Course Content

BLOCK 1 D.C. CIRCUITS AND THEOREMS

- Unit 1: Ohm's Law, KVL, KCL & Simple Problems
- Unit 2: Series and Parallel Circuits
- Unit 3: Thevenin's, Norton's Theorem
- Unit 4: Superposition & Maximum power Theorem

BLOCK 2 A.C. CIRCUITS AND RESONANCE

- Unit 1: Inductance and Capacitance
- Unit 2: Reactance, Susceptance, Conductance, Impedance and Admittance
- Unit 3: Series and Parallel RL, RC and RLC circuits
- Unit 4: Three phase supply & star and delta connection

BLOCK 3 TRANSFORMERS AND MACHINES

- Unit 1: EMF equation of transformers
- Unit 2: Core and Cu losses & OC, SC tests
- Unit 3: D.C Generator & Motor working principle & Types
- Unit 4: Capacitor start induction motor – stepper motor – uses

BLOCK 4 MEASURING INSTRUMENTS AND CRO

- Unit 1: Basic force for indicating instrument
- Unit 2: Permanent magnet & moving coil Instruments & DC meters
- Unit 3: Multi meter for DC & AC Parameters and Bridges
- Unit 4: CRO Working Principle, Block Diagram, Types and applications

BLOCK 5 RECORDERS, TRANSDUCERS & DIGITAL TEST INSTRUMENTS

- Unit 1: X-Y & Strip Chart Recorder Introduction and Classification
- Unit 2: Strain Gauge-Construction, Types and Application
- Unit 3: Capacitive, Inductive, Displacement Transducers and LVDTs
- Unit 4: DVM, Operation, Blocks & Digital Multimeter

Books :

1. Electric Circuit theory by Dr. M. Arumugam and N. Premkumaran.
2. Modern Electronic Instrumentation and Measurements Techniques by Albert D.Helfrick and William David Cooper-PHI
3. Electronic Devices and Circuit theory by Boylestead and Nashelsley
4. Electronic Instrumentation by G.K.Mithal, Khanna Publishers
5. A Text book of Electrical Technology by B.L. Theraja
6. Electrical & Electronic - Measurements & Instrumentation by Sawheney, Dhanpatrai & Sons, New Delhi
7. Electrical & Electronic - Measurements & Instrumentation by Umesh Sinha, Sathyaprakashan Tech
8. Electric Circuit Theory By Dr M. Arumugam, Dr N. Premkumar, Khanna Publishers
9. Electric Circuits By Joseph Edminister, Schaum Series
10. Circuits and Networks by A.Sudhakar, Shyammohan S Palli, Tata MC Publishers

SEMESTER - III
Subject Code : EC302
Subject Title : Electronic Devices

Structure of the Course Content

BLOCK 1 Component and Diodes

Unit 1: Resistor
Unit 2: Diode
Unit 3: Rectifiers
Unit 4: Filters

BLOCK 2 Bipolar Junction Transistors

Unit 1: Transistor Biasing
Unit 2: Transistor Configuration
Unit 3: RC Coupled Amplifier
Unit 4: Feedback Amplifiers

BLOCK 3 Transistor Oscillators and FET, UJT

Unit 1: Oscillator
Unit 2: FET
Unit 3: FET Amplifiers and choppers
Unit 4: UJT

BLOCK 4 Thyristors

Unit 1: SCR
Unit 2: DIAC
Unit 3: TRIAC
Unit 4: MOSFET and IGBT

BLOCK 5 Opto Electronic Devices and Wave shaping Circuits

Unit 1: LDR, LED and LCD
Unit 2: Opto Coupler, Interrupter
Unit 3: Clipping and Clamping Circuits
Unit 4: Multivibrators

Books :

- 1.Principle of Electronics By VK Metha
- 2.Electronic Principles by Malvino, Tata MC Publishers
3. Electronics Devices and Circuits by Allen Mottershed, Tata McGraw – Hill
4. Electronics Devices and Circuits by Jacob Millman and Halkies, Tata McGraw Hill
5. Optical Fiber Communication by Gerd Keiser
6. Electronics Devices and Circuits by Sachin S Saharma by Lakshmi Publications Pvt Ltd, New Delhi
7. Electronics Devices and Circuits by Balwinder Singh, Ashish Dixit, Balwant Raj by Lakshmi Publications Pvt Ltd, New Delhi
8. Analog and Digital Electronics by Bhupesh Bhtia, Sunil Paliwal, Balvir Singh, Navneet Sharma, Lakshmi Publications Pvt Ltd, New Delhi
9. Basic Electronics by Rakesh Kumar Garg, Asish Dixit, Pawan Yadav, Lakshmi Publications Pvt Ltd, New Delhi
10. Basic Electronics Engineering & Devices by Dr.R.K.Singh, Asish Dixit, Lakshmi Publications Pvt Ltd, New Delhi

SEMESTER - III
Subject Code : EC303
Subject Title : C- Programming

Structure of the Course Content

BLOCK 1 Programming Introduction

Unit 1: Keywords, Constants, Variables and Data types
Unit 2: Operations and Expressions
Unit 3: I/O Statements
Unit 4: Functions

BLOCK 2 Conditional and Branching Statements

Unit 1: Simple If statement
Unit 2: Decision making statements
Unit 3: Branching
Unit 4: Looping

BLOCK 3 Arrays & Characters

Unit 1: Arrays
Unit 2: Handling of Characters
Unit 3: Handling of Character Strings
Unit 4: Functions

BLOCK 4 Special Types

Unit 1: Structures
Unit 2: Unions
Unit 3: Macro Substitution
Unit 4: Compiler Controlled Directives

BLOCK 5 Pointer and File management

Unit 1: Introduction to Pointers
Unit 2: Pointers for Various Data Types
Unit 3: Introduction to File management and file inclusion
Unit 4: Different File I/O functions and statements

Books :

1. Programming in ANSI C by E. Balagurusamy TMGH, New Delhi
2. Programming with C by Byron Gottfried. Schaum Series -TMGH
3. Let us C by Yashavent Kanethar BPB Publication, 2005, New Delhi
4. Programming in C by Schaum Series, McGraw Hills Publishers
5. Data Structures by Lipschutz Schaum Series
6. Introduction to Data structures by Bhagat Singh, TMGH, New Delhi
7. Introduction to Data structures with applications by Trembley and Sorenson, TMGH
8. Data Structure using 'C' by Dr.Prabhakar Gupta, Vineet Agarwal,Manish Varshney, Lakshmi Publications (Pvt) Ltd, New Delhi
9. Data Structure using 'C++' by N.Jayalakshmi, Lakshmi Publications (Pvt) Ltd, New Delhi
10. Introduction to Data Structure using C by Venkatesh N.Baitipuli, Lakshmi Publications (Pvt) Ltd, New Delhi

SEMESTER - III
Subject Code : EC304
Subject Title : Microprocessor

Structure of the Course Content

BLOCK 1 Introduction

- Unit 1: Evolution of Microprocessors
- Unit 2: Advantages of Microprocessors
- Unit 3: Various MPU Families (SSI, LSI, VLSI, SLSI)

BLOCK 2 8085

- Unit 1: Introduction
- Unit 2: Architecture of 8085
- Unit 3: Block and Pin Diagram of 8085 and its functions
- Unit 4: BUS Details

BLOCK 3 8085 Programming

- Unit 1: Instruction formats & Addressing Modes
- Unit 2: Instruction Set and Its Cycle
- Unit 3: Timing Diagrams and Status Signals
- Unit 4: Simple Programs

BLOCK 4 8085 Interfacing

- Unit 1: Memory mapping
- Unit 2: Interrupts
- Unit 3: I/O Peripheral Interfacing

BLOCK 5 16 bit Microprocessor

- Unit 1: Introduction to 8086
- Unit 2: Architecture of 8086
- Unit 3: Block and Pin Diagram of 8086 and its functions
- Unit 4: BUS Details

Books :

1. 8085 Microprocessor and its applications by Ramesh Gaonkar, Penram Publishers
2. 8086 Microprocessor by Douglas Hall
3. Advanced Microprocessor and Microcontrollers by N.Parasuraman, N.V.Publications
4. www.Intel.com
5. Microprocessors and Interfacing by Douglas V.Hall and Hebbler, K.M, Tata McGraw-Hill
6. Advanced Microprocessors & Peripherals by Dr. Ajoy Kumar Ray and K.M.Burchandi, Tata McGraw-Hill
7. Advanced Microprocessors and Interfacing by Badri Ram, Tata McGraw-Hill
8. Introduction to Microprocessors by A.P.Mathur, Tata McGraw-Hill
Microprocessor 8085 by G.T.Swamy, Lakshmi Publications (Pvt) Ltd, New Delhi
9. Advanced Microprocessor and Microcontrollers by Prof S.K.Venkata Ram, Lakshmi Publications (Pvt) Ltd, New Delhi
10. VLIW Microprocessor Hardware Design by Lee Weng Fook, Tata McGraw-Hill

SEMESTER - III

Subject Code : EC305

Subject Title :ELECTRONIC DEVICES Lab

LIST OF EXPERIMENTS

1. VI Characteristics of PN JN Diode
2. VI Characteristics of Zener diode.
3. HW, FW with and without filter.
4. Bridge Rectifier with and without filters.
5. VI characteristics of Regulator.
6. Input/output characteristics of CE Transistor.
7. Frequency response of RC coupled amplifier.
8. Emitter follower.
9. Negative feedback amplifier.
10. RC phase shift oscillator.
11. Hartley and Colpitts oscillator.
12. JFET characteristics.
13. Common source amplifier.
14. UJT characteristics.
15. UJT relaxation oscillator.
16. SCR characteristics.
17. DIAC and TRIAC characteristics.
18. Clipper, clamper and voltage doubler.
19. LDR, Photo diode and Photo transistor characteristics.
20. Solar cell and opto coupler.

SEMESTER - III

Subject Code : EC306

**Subject Title : ELECTRICAL CIRCUITS & INSTRUMENTATION
LAB**

LIST OF EXPERIMENTS

1. Verification of Ohm's Law
2. Verification of Kirchoff's Voltage and current Law
3. Verification of Superposition theorem
4. Verification of Thevenin's theorem
5. Verification of Norton's Theorem
6. Verification of maximum Power transfer theorem
7. To Conduct OC and SC test to determine the efficiency of transformer
8. To Calibrate of ammeter and Voltmeter
9. To Construct and test the performance of Wheatstone bridge
10. To Construct and test the performance of Wien bridge
11. To Construct RLC bridge to measure R , L and C
12. To measure the amplitude and frequency using dual trace CRO
13. To measure frequency and phase angle using CRO by Lissajous Figure
14. To Construct and test the performance of photoelectric transducer
15. To measure displacement using LVDT
16. To measure the strain using load cell
17. To measure the strain using strain gauge
18. To measure the temperature using thermistor

SEMESTER - : IV
Subject Code : EC401
Subject Title : LINEAR and DIGITAL ICs

Structure of the Course Content

BLOCK 1 Linear IC

Unit 1: OP Amp
Unit 2: Timer Circuits
Unit 3: Multivibrators
Unit 4: Voltage Regulators

BLOCK 2 Boolean algebra

Unit 1: Number Systems
Unit 2: Basic Laws and Theorems
Unit 3: Basic Logic Gates
Unit 4: Karnaugh Maps

BLOCK 3 Combinational logic

Unit 1: Arithmetic Circuits
Unit 2: Adders
Unit 3: Encoders and Decoders
Unit 4: IC Families (TTL, CMOS, LS)

BLOCK 4 Sequential logic

Unit 1: Flip Flops
Unit 2: Counters
Unit 3: State Diagram
Unit 4: Shift Registers

BLOCK 5 D/A, A/D and Memory

Unit 1: D/A Converter
Unit 2: R-2R ladder Network
Unit 3: A/D Converters
Unit 4: Memories

Books :

- 1.Modern Digital Electronics By RP Jain, TataMcHill Publishers
- 2.Digital Principles and Applications By AP Malvino and Leach TataMcHill Publishers
- 3.Digital Electronics by Roger L. Tokheim Macmillan, TataMcHill Publishers
- 4.Digital Electronics – An introduction to theory and practice by William H.GothMann, PHI
- 5.Electronic devices, Applications and Integrated Circuits by Satnam P.Mathur and others, Umesh Publications
- 6.Linear Integrated Circuits by Salivahanan, Tata McGraw Hill, New Delhi
- 7.Linear Integrated Circuits(Sigma) by Bali, Tata McGraw Hill, New Delhi
- 8.Design with Operational Amplifiers & Analog Integrated Circuits by Franco, Tata McGraw Hill, New Delhi
- 9.Design of Analog CMOS Integrated Circuits by Razavi, Tata McGraw Hill,
- 10.Analog and Digital Electronics by Bhupesh Bhatia, Sunil Paliwal, Balvir Singh, Navneet Sharma, Lakshmi Publications Pvt Ltd, New Delhi

SEMESTER - : IV
Subject Code : EC402
Subject Title : Computer Hardware and Networking

Structure of the Course Content

BLOCK 1 Mainboards and Processors

Unit 1: Introduction to Computers
Unit 2: Mainboard and Chipsets
Unit 3: Interface Bus Standards
Unit 4: Processors

BLOCK 2 Peripherals

Unit 1: Input Devices
Unit 2: Output Devices
Unit 3: Storage Devices (HDD)
Unit 4: Removable Storage Devices (CD/DVD, FDD)

BLOCK 3 I/O Ports and External Peripherals

Unit 1: Video Capture and Sound Card
Unit 2: Serial and Parallel Ports and Power Supply Unit
Unit 3: Modem, Digital Cameras
Unit 4: Printer and Scanners

BLOCK 4 PC assembling and testing

Unit 1: PC assembly
Unit 2: CMOS Setup
Unit 3: POST
Unit 4: Diagnostic Software and Anti Virus

BLOCK 5 Computer Network and Installation

Unit 1: Network Basics
Unit 2: LAN
Unit 3: Media and Hardware
Unit 4: Network Administration

Books :

1. IBM PC and CLONES by B.Govindrajalu, Tata McGraw-Hill Publishers
2. Computer Installation and Servicing by D.Balasubramanian, Tata McGraw Hill ,
3. Computer Installation and Troubleshooting by M.Radhakrishnan, ISTE- Learning Materials 2001
4. The complete PC upgrade and Maintenance by Mark Minasi, BPB Publication
5. Inside the PC by Peter Norton, Tech Media
6. Troubleshooting, Maintaining and Repairing PCs by Stephen J Bigelow, Tata McGraw Hill Pub 2001
7. Basic Refrigeration and Air-Conditioning by Ananthanayanan P.N, Tata McGraw-Hill
- 8.PC hardware by Balvir Singh, Lakshmi Publications (Pvt) Ltd, New Delhi
- 9.PC Repair and Maintenance: A Practical Guide by Joel Rosenthal, Kevin Irvin, Lakshmi Publications (Pvt) Ltd, New Delhi
- 10.PC Architecture and Peripherals-I by Dinesh Maidasani, Lakshmi Publications (Pvt) Ltd, New Delhi

SEMESTER - : IV
Subject Code : EC403
Subject Title : INDUSTRIAL ELECTRONICS

Structure of the Course Content

BLOCK 1 THYRISTORS and PHASE CONTROL CIRCUITS

- Unit 1: SCR, MOSFET, IGBT, SIT and GTO
- Unit 2: Gate Trigger Circuits DC & AC Circuits
- Unit 3: Pulse transformer in trigger circuit & Electrical isolation
- Unit 4: Ssynchronized UJT triggering, Ramp and Pedestal trigger

BLOCK 2 CONVERTERS AND CHOPPERS

- Unit 1: Single Phase converters with R, RL and fly wheel diode
- Unit 2: Line commutation
- Unit 3: 3 phase Half and full converters
- Unit 4: Chopper DC & AC , MOSFET Chopper, PWM Control Circuit

BLOCK 3 POWER SUPPLIES

- Unit 1: Inverters (1 Φ & 3 Φ using Thyristors with R and L load)
- Unit 2: MOSFET and IGBT Inverters & Applications of Inverters
- Unit 3: SMPS Working Principles, Circuit Blocks & Types
- Unit 4: UPS Types Comparison & Applications

BLOCK 4 PLC AND PROGRAMMING

- Unit 1: Introduction of PLC, Blocks of PLC
- Unit 2: I/O modules of PLC
- Unit 3: Communication & Logic Functions
- Unit 4: Ladder programming Bit instruction, Timer/Counters

BLOCK 5 CNC

- Unit 1: Basic concept of numerical control
- Unit 2: DC & Stepper Motors, Data Processing
- Unit 3: Part Programming, Post processor Elements, APT
- Unit 4: ADAPT/EXAPT, ACC, ACO, Basic concepts of Robotics

Books :

1. Industrial and Power Electronics by Harish C. Rai Umesh Publication
2. Power Electronics by Dr. P.S. Bimbhra, Khanna Publications
3. Programmable Logic Controller by Pradeep Kumar & Srivashtava – BPB
4. Power Electronics by M.H. Rashid, PHI Publication Pvt. Ltd. New Delhi.
5. Power Electronics – M.D. Singh & K.B. Khan Cahndani, TMH
6. Programmable Contollers by Richard A. Cox Vikas Publishing Houses
7. Numerical Control of Machines Yoram Korean and Joseph Ben
8. Industrial Electronics and Control by TTTI, Tata McGraw Hill, New Delhi
9. Power electronics by Sen, Tata McGraw Hill, New Delhi
10. Power electronics by Singh, Tata McGraw Hill, New Delhi

SEMESTER - IV
Subject Code : EC404
Subject Title : OBJECT ORIENTED PROGRAMMING

Structure of the Course Content

BLOCK 1 Introduction to OOPs

- Unit 1: Limitation of Procedural Languages
- Unit 2: Object Oriented approach
- Unit 3: Analogy; Approach to Organisation
- Unit 4: characteristics of Object Oriented Languages

BLOCK 2 Encapsulation

- Unit 1: Introduction
- Unit 2: Types of Encapsulation
- Unit 3: Objects
- Unit 4: Classes

BLOCK 3 Data abstraction

- Unit 1: Introduction
- Unit 2: Types of Data Abstraction
- Unit 3: Binding
- Unit 4: Types of Binding

BLOCK 4 Inheritance

- Unit 1: Introduction
- Unit 2: Types of Inheritance
- Unit 3: Characteristics
- Unit 4: Programs

BLOCK 5 Polymorphism

- Unit 1: Introduction
- Unit 2: Types of Polymorphism
- Unit 3: Over Loading
- Unit 4: Application of OOPS

Books :

1. Programming in 'C' (with CD) by Balagurusamy E, Tata McGraw Hill Publishing Company, New Delhi
2. Computer Programming in C by Rajaraman V , Prentice Hall of India (P),Ltd.,
3. Object Oriented Programming with C++ by Balagurusamy E , Tata McGraw Hill Publishing Company, New Delhi
4. Programming with C++ by Astrchan, Tata McGraw Hill Publishing Company,
5. Programming with C++ by Hubbard, Tata McGraw Hill Publishing Company,
6. Programming in C++ by Cohoon, Tata McGraw Hill Publishing Company,
7. Programming with C++ by Ravichandran, Tata McGraw Hill Publishing Company, New Delhi
8. Programming in C++ by J.B.Dixit, Lakshmi Publications, New Delhi
9. Object Oriented C++ Programming by Hirday Narayan Yadav, Lakshmi Publications, New Delhi
10. Basics of C++ Programming by Nishant Kundalia, Lakshmi Publications, New Delhi

SEMESTER - IV
Subject Code : EC405
Subject Title : IC Lab

LIST EXPERIMENTS

1. Construct and test a) Inverting Amplifier and b) Non inverting amplifier using Op- --Amp.
2. Construct and test a) Scale changer circuit b) Summer circuit using Op.Amp.
3. Construct and test a) Differentiator circuit b) Integrator circuit using Op. Amp.
4. Construct and test a) Astable Multivibrator using IC 555 and test its performance.
5. Construct and test a) Monostable Multivibrator using IC 555 and test its performance.
6. Verify the truth table for the following gates AND, OR, NOT, NAND, NOR, EX-OR USING 74XX Ics.
7. Construct other gates using NAND gates.
8. Construct a Half Adder using 7408, 7432, 7486, Ics and verify its truth table.
9. Construct Full Adder and verify the truth table using 74XX Ics.
10. Construct Half Subtractor and verify its truth table using 74XX Ics.
11. Construct Full Subtractor and verify its truth table using 74XX Ics.
12. Construct and verify the truth table of RS,D and JKM FFS.
13. Construct a 4 bit BCD counter using 7473 Ics and observe the output waveform.
14. Construct a Decade counter using 7473 Ics and observe the output waveform.
15. Construct and verify the performance of a 1 digit counter using 7490, 7447, 7475 and seven segment LEDs.
16. Construct a 4 bit weighted Resistor D/A converter and test its performance.
17. Construct a 4 bit r-2R Ladder D/A converter and test its performance.
18. Verify the operation of ADC.

SEMESTER - IV

Subject Code : EC406

Subject Title : INDUSTRIAL ELECTRONICS LAB

LIST EXPERIMENTS

1. Determine the phase control characteristics of SCR.
2. Construct and test commutation circuits of SCR.
3. Construct and test a single phase inverter.
4. Construct and test a MOSFET based PWM chopper circuit.
5. Construct and test a multiple pulse sine wave inverter.
6. Construct and test an IC based buck converter using PWM.
7. Write and implement a simple ladder logic program using digital inputs and outputs for PLC.
8. Write the implement a simple ladder logic program using timer and counter with branching and subroutines with PLC.
9. Write and implement a simple ladder logic program for interfacing a lift control with PLC.
10. Write and implement a simple ladder logic program for interfacing a conveyor control with PLC.
11. Write and implement a program for CNC lathe involving linear position, circular interpolation and repeat cycle.
12. Write and implement a program for CNC milling for a simple component involving linear position and interpolation.

SEMESTER - V
Subject Code : EC501
Subject Title : VLSI

Structure of the Course Content

BLOCK 1 NUMBER SYSTEM & LOGIC GATES

- Unit 1: Number Systems
- Unit 2: Unsigned and Signed Binary Numbers
- Unit 3: Alphanumeric Codes & Error Correction and Detection
- Unit 4: Basic Gates & CMOS Gates, Three State Gates

BLOCK 2 COMBINATIONAL & SEQUENTIAL LOGIC DESIGN

- Unit 1: Designing Combinational Circuits , Karnaugh Maps
- Unit 2: Adders, Subtractors, Comparators, MUX and Encoders
- Unit 3: Storage Elements, Flip-Flops, Registers & Sequential Circuits design
- Unit 4: State Machines, Mealy and Moore Machines, Static RAM

BLOCK 3 PROGRAMMABLE LOGIC DEVICES

- Unit 1: ROM, NOR Imp
- Unit 2: Distributed and Array Programmability, ROM variants
- Unit 3: Flash, PAL and PLA
- Unit 4: 3 State Outputs, Macro cells & Programmable Registers

BLOCK 4 VHDL PROGRAMMING

- Unit 1: Intro to VHDL, Entity, Architectures, Concurrent Signal,
- Unit 2: Events, Structural Designs, Sequential Behavior, Process
- Unit 3: Sequential, Architecture, Configuration Statements
- Unit 4: Behavioral Modelling, Sequential Processing, Subprograms

BLOCK 5 CPLD & FPGA ARCHITECTURE

- Unit 1: CPLDs and FPGAs & Generic PLD Architecture
- Unit 2: Complex Programmable Logic Devices
- Unit 3: CPLD Architecture Description & Cool Runner CPLDs
- Unit 4: Generic FPGA Architecture & Spartan-3 FPGAs

Books :

1. Fundamentals of Digital Logic and Microcomputer Design by M. Rafiqzaman, Wiley Eastern
2. VHDL Programming by Example “ by Douglas L. Perry – Fourth Edition
3. Digital Design and Implementation with Field Programmable Devices by Zainalabedin Navabi
4. Digital Electronics with PLD Integration by Nigel P. Cook
5. Programmable Logic Design Quick Start Hand Book By Karen Parnell & Nick Mehta
6. Programmable Logic Handbook: PLDs, CPLDs, and FPGAs by Ashok K. Sharma
7. Digital Logic Simulation and CPLD Programming with VHDL by Steve Waterman
8. HDL Programming Fundamentals: VHDL and Verilog by Nazeih M. Botros
9. Spartan-3 Platform FPGA Handbook by Marc Baker, Kim Goldblatt, Steven Knapp
10. Stephen Brown and Zvonko Vranesic, “ Fundamentals of Digital Logic Design with VHDL “. Second Edition McGraw Hill International, Singapore

SEMESTER - V
Subject Code : EC502
Subject Title : MICROCONTROLLER

Structure of the Course Content

BLOCK 1 ARCHITECTURE OF 8051

- Unit 1: Evolution of MPU
- Unit 2: MPU Vs Microcontrollers
- Unit 3: Architecture, Block Diagram and Pin Details of 8051
- Unit 4: Functions of Blocks and Pins

BLOCK 2 SFR

- Unit 1: ALU and Special Functional Registers (SFR) Blocks
- Unit 2: PC,PSW, Memory Mapping
- Unit 3: I/O Ports, Timers and Interrupts
- Unit 4: Clock, Serial Port, Instruction Set & it's Cycle

BLOCK 3 INSTRUCTION SET AND PROGRAMMING

- Unit 1: Assembling and running an 8051 program
- Unit 2: Addressing Modes, Data Transfer, Arithmetic & Logical Inst
- Unit 3: Rotate and Branching Instructions
- Unit 4: Call, Delay, PC Instructions

BLOCK 4 I/O, TIMER, INTERRUPT & SERIAL Programming

- Unit 1: I/O & Memory Programming
- Unit 2: Timer Programming
- Unit 3: Serial Programming
- Unit 4: Interrupt Configuration for Internal and External & Programing

BLOCK 5 INTERFACING EXTERNAL DEVICE WITH 8051

- Unit 1: Memory Interfacing
- Unit 2: 8255, ADC/ DAC Interfacing
- Unit 3: Relays & Opto Isolators, Sensors Interfacing
- Unit 4: Seven Segment, LCD, Stepper Motor PWM RTC Interfacing

Books :

1. Microprocessor and Microcontroller by R.Theagarajan, Sci tech Publications
2. The 8051 Microcontroller By Kenneth J Ayala, Penram Internationa Publication
3. 8085 Microprocessor and its applications by Ramesh gaonkar, Penram Publishers
4. 8086 Microprocessor by Douglas hall
5. Microprocessors and Interfacing by Douglas V.Hall and Hebbber,K.M, Tata McGraw-Hill
6. Advanced Microprocessors & Peripherals by Dr. Ajoy Kumar Ray and K.M.Burchandi, Tata McGraw-Hill
7. Advanced Microprocessors and Interfacing by Badri Ram, Tata McGraw-Hill
8. Introduction to Microprocessors by A.P.Mathur, Tata McGraw-Hill
9. Microprocessor 8085 by G.T.Swamy, Lakshmi Publications (Pvt) Ltd, New Delhi
10. Advanced Microprocessor and Microcontrollers by Prof S.K.Venkata Ram, Lakshmi Publications (Pvt) Ltd, New Delhi

SEMESTER - V
Subject Code : EC503
Subject Title : COMMUNICATION ENGINEERING - I

Structure of the Course Content

BLOCK 1 NETWORKS, ANTENNA AND PROPAGATION

Unit 1: N/w Characteristics, Z_{oc} , Z_{sc} of T & JI N/w, Z_{i1} , Z_{i2} of T & L N/w
Unit 2: Equalisers, Attenuators, Filters, TX Line
Unit 3: Antennas
Unit 4: Wave Propagation

BLOCK 2 AMPLITUDE MODULATION

Unit 1: Modulation
Unit 2: Amplitude modulation
Unit 3: AM Transmitter
Unit 4: AM Receiver

BLOCK 3 ANGLE AND PULSE MODULATION

Unit 1: FM
Unit 2: FM Transmitters & Receivers
Unit 3: PM
Unit 4: Pulse Modulation

BLOCK 4 AUDIO SYSTEMS

Unit 1: Microphones
Unit 2: Loud speakers
Unit 3: Audio recording
Unit 4: Audio reproduction

BLOCK 5 TELEGRAPH AND TV FUNDAMENTALS

Unit 1: Telegraphy
Unit 2: Monochrome Television
Unit 3: Colour TV
Unit 4: Principles of Handy cam, LCD projector, CCTV and cable TV

Books :

1. Networks lines and fields by John D.Ryder, PHI
2. Electronic communication Systems by Kennedy, TMH
3. TV and Video Engineering by Arvind M.Dhake ,TMH
4. Electronic Communication by Dennis Roddy and John colen, PHI
5. Radio Engineering by Terman, MGH
6. Fundamentals of Acoustics by Kingsler & frey , Wiley Eastern ltd.
7. Transmission lines & Networks by Umesh sinha , Sathya prakashan publications
8. Radio engineering by G.K.Mithal, Khanna publishers
9. Microwave Transmission Networks by Lehpamer, TMH
10. Introduction to RADAR Systems by Skolnik, TMH

SEMESTER - V
Subject Code : EC504
Subject Title : ROBOTICS
Structure of the Course Content

BLOCK 1 BASIC CONFIGURATION OF ROBOTICS AND ITS WORKING

- Unit 1: Introduction & basic Configuration
- Unit 2: Components & Blocks, SCARA
- Unit 3: Classification & Characteristics of Robot
- Unit 4: Rotations and Conversions of various motions

BLOCK 2 ROBOT CONTROLLER, SERVO SYSTEM

- Unit 1: Level of Controller, Open & Closed Loop Controller
- Unit 2: MPU based controller, path & Point Control
- Unit 3: Sensor based controller & Programming
- Unit 4: Drives and Devices for Controllers

BLOCK 3 ROBOT MOTION ANALYSIS

- Unit 1: Robot motion analysis, kinematics, dynamics
- Unit 2: Gripper design & Types
- Unit 3: Transducers & Sensors
- Unit 4: MDI & Computer Control

BLOCK 4 ROBOT PROGRAMMING

- Unit 1: Robot programming
- Unit 2: Lead through methods and Textual robot languages
- Unit 3: Motion specification - motion interpolation
- Unit 4: Robot language structure, Basic commands, Artificial intelligence

**BLOCK 5 ROBOT APPLICATION IN MANUFACTURING AND AUTO
ELECTRONICS**

- Unit 1: Material handling, Assembly finishing
- Unit 2: Characteristics & Selection stages
- Unit 3: Fuel Tank, Water Level, Temp, Pressure Sensors
- Unit 4: Speed, Heat, Pressure & Door Lock Warning Systems

Books :

1. Industrial Robotics - Technology – Programming and Applications by Mikell P. Groover, Mite chell weiss, Roger Negal and Nicholes G. Odress.
2. Robotics – An Introduction by Doughales, R. Halconnjr
3. Robotics Technology and Flexible Automation by Deb, TMH
4. Robotics: Control,Sensing,Vision an Intelligence by Fu, TMH
5. Industrial Robtics by Groover, TMH
6. Robtics and Control by Mittal and Nagrath, TMH
7. Introduction to Robotics by Saha, TMH
8. Modern Electric Equipments for Automobile by JUDGE. AW, Chapman & Hall London

SEMESTER - V

Subject Code : EC505

Subject Title : VLSI Lab

LIST EXPERIMENTS

1. Write simple VHDL Codes for
 - a. Addition,
 - b. Subtraction
 - c. Multiplication
 - d. Division and implement on FPGA kit.

2. Write a VHDL Code for
 - a. 8 Bit Digital output using LEDs
 - b. 8 Bit Digital inputs using

3. Write VHDL Code for 4 x 4 matrix keypad interface.
4. Write a VHDL Code for
 - a. Relay interface
 - b. Buzzer Interface

5. Write a VHDL code for 7 Segment LED display interface
6. Write a VHDL code for Stepper motor interface
7. Write a VHDL code for Traffic light control
8. Write a VHDL code for 4 bit binary counter and study all signals using simulation software
9. Write a VHDL code for LCD display to display a text message.
10. Write a VHDL code to generate PWM signals for DC Motor control
11. Write a VHDL code & implement on FPGA kit for MUX & DEMUX
12. Write a VHDL Program & implement on FPGA kit for Encoder, Decoder & Shift

SEMESTER - V

Subject Code : EC506

Subject Title : COMMUNICATION LAB

LIST EXPERIMENTS

1. To construct a transistor video amplifier and to find its frequency response characteristics.
2. To construct a sync separator circuit and test its performance.
3. To construct a sample and hold circuit and trace the waveforms.
4. PSK modulation – Trace the output waveform.
5. PSK demodulation – Trace the output waveform.
6. Setting up a fiber optic analog link.
7. Setting up a fiber optic digital link.
8. To measure the bending loss and propagation loss in fiber optics.
9. TDM of signals
10. Analog transmitter and receiver.
11. FSK transmitter and receiver.
12. ASK modulation - Trace the output waveform.
13. PWM modulation - Trace the output waveform.
14. To find Deflection sensitivity of CRT.
15. To measure the output at various points in sound section.
16. To measure the output at various points in video section.
17. To measure the output at various points in picture tube deflection section.
18. Assembling and testing of Yagi antenna.

SEMESTER - VI

Subject Code : EC601

Subject Title : EMBEDDED SYSTEMS

Structure of the Course Content

BLOCK 1 Introduction to Embedded System and LPC 2148 ARM Controller

Unit 1: Introduction, Types & Features of Embedded Systems

Unit 2: LPC 2148 Architecture & Blocks, ARM 7 TDMI-S,

Unit 3: Memory map, CPU Registers, Modes of operation

Unit 4: SFR, Instruction Set, Arithmetic Programming in Assembly level

BLOCK 2 Embedded C basics, GPIO (Slow), Timer and Interrupt

Unit 1: Embedded C basics – GPIO (Slow) register map

Unit 2: 8 Bit LED & Switches, Buzzer, Relays, Stepper Motor Interfacing

Unit 3: Timer / Counter Programming

Unit 4: Interrupt Programming

BLOCK 3 PWM, ADC, DAC and RTC

Unit 1: PWM Features & programming

Unit 2: ADC & Temp sensor Interfacing Programming

Unit 3: DAC Interfacing Programming

Unit 4: Real Time Clock

BLOCK 4 I²C, UART

Unit 1: Start, Stop, ACK, Restart, NACK signals

Unit 2: I²C feature in LPC 2148 & Block Diagram

Unit 3: Interfacing I²C based I/O expander PCF 8574

Unit 4: UART

BLOCK 5 RTOS and μ C OS II

Unit 1: Foreground/Background systems, Function of OS

Unit 2: Resources Processing, Tasks, TCB

Unit 3: Schedulers & Introduction to μ C OS

Unit 4: Various Functions of μ C OS

Books :

1. Data Sheet for PIC Controller
2. Embedded System Architecture by Tammy Noergaard
3. ARM System Developer's Guide by Andrew N. Sloss
4. ARM Architecture Reference Manual by David Seal
5. ARM System-on-chip Architecture by Steve Furbe (Second Edition)
6. MicroC / OS – II The Real Time Kernel by Jean J. Labrosse
7. Real Time Concepts for Embedded Systems by Qing Li and Caroline Yao
8. Embedded / Real Time Systems: Concepts, Design & Programming by Dr. K.V.K.K. Prasad
9. LPC2148 User Manual
10. Embedded Systems: Architecture, Programming and Design by Raj Kamal, Tata McGraw-Hill

SEMESTER - VI
Subject Code : EC602
Subject Title : COMMUNICATION ENGG - II

Structure of the Course Content

BLOCK 1 RADAR AND NAVIGATIONAL AIDS

- Unit 1: Radar Systems & Applications
- Unit 2: Radio navigation, Compass, telemetry, Landing System
- Unit 3: Telephony Public, Private N/w, ISDN, Cordless, Video Phones
- Unit 4: FAX

BLOCK 2 DIGITAL COMMUNICATION

- Unit 1: Intro to Digital Commn. System & it's advantages
- Unit 2: Digital Codes
- Unit 3: Digital Modulation techniques
- Unit 4: Data Sets & Interconnections

BLOCK 3 OPTICAL COMMUNICATION

- Unit 1: Optical communication system Blocks & Advantages
- Unit 2: Ray Theory, Fibers
- Unit 3: Losses , Optical Sources, Detectors, Connectors
- Unit 4: OFC, Couplers, Applications of Optical Systems

BLOCK 4 SATELLITE COMMUNICATION

- Unit 1: Satellite system, Kepler's I,II,II laws, orbits
- Unit 2: Space segment-
- Unit 3: Earth segment
- Unit 4: Satellite services

BLOCK 5 MOBILE COMMUNICATION

- Unit 1: Evolution Cellular telephone & fundamental concepts
- Unit 2: Frequency reuse & Interference
- Unit 3: Satellite multiple access techniques
- Unit 4: Digital cellular system & GSM

Books :

1. Electronic communication systems by Kennedy , Davis , TMH
2. Electronics communication by Dennis Roddy and John coolen, PHI
3. Optical fiber communication by Gerd Keiser , McGraw Hill
4. Optical communication system by John Gower , PHI
5. Satellite communication by Dr. D.C. Agarwal ,Khanna publishers
6. Satellite communication by Dennis Roddy McGraw Hill
7. Electronic Communications systems , Fundamentals through Advanced by Wayne Tomasi Pearson Education.
8. Wireless communication, Principles and practice by Theodore S. Rappaport , pearson education
9. Mobile communication by Jochen H. Schiller ,Pearson Education

SEMESTER - VI
Subject Code : EC603
Subject Title : TELEVISION ENGINEERING

Structure of the Course Content

BLOCK 1 TV FUNDAMENTALS

- Unit 1: Blocks in TV
- Unit 2: Functions of various Blocks & Scanning and Synchronization
- Unit 3: Composite Video Signal, TV Standards
- Unit 4: Mixing of colours, Chrominance & Luminance

BLOCK 2 CAMERA AND PICTURE TUBES

- Unit 1: Camera Tube Blocks, Functions and Construction
- Unit 2: CCD Image Sensors
- Unit 3: Colour TV Camera Tube
- Unit 4: Functions and Operations of Picture Tube

BLOCK 3 TELEVISION TRANSMITTER

- Unit 1: IF Modulation
- Unit 2: Visual Modulator & CIN Diplexer
- Unit 3: Block Diagram of Colour TV Tx
- Unit 4: PAL

BLOCK 4 TELEVISION RECEIVERS

- Unit 1: Block diagrams of monochrome TV receiver & functions
- Unit 2: RF Tuner & Types, AGC Block, Frequency Compensation
- Unit 3: Block diagram of PAL color receiver
- Unit 4: block diagrams of PAL chroma Decoder IC TA7699 and IC TA 7680

BLOCK 5 VARIOUS DISPLAYS & MODERN TV SYSTEMS

- Unit 1: FLAT Panel, Plasma, IR Remote Control Blocks
- Unit 2: Remote IC M 50463p 50142p MN15287
- Unit 3: Cable TV System
- Unit 4: VCD, DVD systems

Books :

1. TV and video Engg by Aravind M.Dhake
2. Modern TV practice principles of Technology and servicing by R.R. Gulati
3. color television and video technology by A.K. Maini
4. Modern VCD – video CD player Introduction, servicing and trouble shooting by Manohar Lotia ,pradeep Nair

SEMESTER - VI
Subject Code : EC604
Subject Title : EMBEDDED SYSTEMS LAB

LIST EXPERIMENTS

1. Write Assembly language programs for
a) Addition, b) Subtraction, c) Multiplication, d) Division
Write the Programs in Embedded C for the following experiments

2. 8 bit LED and switch Interface
3. Buzzer, Relay and Stepper Motor Interface
4. Time delay program using built in Timer / Counter feature
5. External interrupt
6. Displaying a number in a seven segment display
7. 4 x 4 Matrix Keyboard
8. Multi digit Seven segment display
9. Displaying a message in a 2 line x 16 Characters LCD display
10. ADC and Temperature sensor LM 35 Interface
11. I2C Interface – 7 Segment display
12. I2C Interface – Serial EEPROM
13. Transmission from Kit and reception from PC using Serial Port
14. Generation of PWM Signal

RTOS based experiments

1. Blinking two different LEDs
2. Displaying two different messages in LCD display in two lines
3. Sending messages to mailbox by one task and reading the message from mailbox by another task
4. Sending message to PC through serial port by three different tasks on priority basis
5. Reading temperature from LM 35 interface and plot the temperature Vs Time graph using Graphics LCD – Study Experiment.

SEMESTER - VI
Subject Code : EC605
Subject Title : Project work