

**Bharath Postgraduate College
In collaboration with**



KARNATAKA STATE OPEN UNIVERSITY
Manasagangotri, Mysore – 570006, Karnataka

B Tech - ELECTRICAL

SEMESTER SYSTEM

SYLLABUS

I YEAR SYLLABUS
(Basic Engineering)
(Common to all Branches)

Subject Code	Subject Title	Max marks	Max Credits
Semester-I			
BE1001	English-I	100	2
BE1002	Mathematics-I	100	2
BE1003	Engineering Physics-I	100	2
BE1004	Engineering Chemistry-I	100	2
BE1005	Fundamentals of Computing and Programming	100	3
BE1006	Physics & Chemistry Laboratory – I	100	2
BE1007	Computer Application Lab	100	2
Semester -II			
BE2001	Technical English	100	2
BE2002	Mathematics-II	100	2
BE2003	Engineering Physics-II	100	2
BE2004	Engineering Chemistry-II	100	2
BE2005	Engineering Graphics	100	3
BE2006	Computer Practice Laboratory-II	100	2
BE2007	Engineering Practices Laboratory	100	2

Electrical and Electronics Engineering- III Semester

Subject Code	Subject Title	Max Marks	Max Credits
EE3001	Engineering Mathematics	100	2
EE3002	Electrical Circuit Theory	100	3
EE3003	Electronic Devices and Circuits	100	3
EE3004	Electrical Machines-I	100	3
EE3005	Electromagnetic Theory	100	3
EEP001	Electronic Devices Lab	100	2
EEP002	Electrical Machines –I Lab	100	2

Electrical and Electronics Engineering-IV Semester

Subject Code	Subject Title	Max Marks	Max Credits
EE4001	Control Systems	100	2
EE4002	Measurements and Instrumentation	100	2
EE4003	Electrical Machines-II	100	3
EE4004	Environmental Science	100	3
EE4005	Communication Engineering	100	3
EEP003	Control and Instrumentation Lab	100	2
EEP004	Electrical Machines –I I Lab	100	2

Electrical and Electronics Engineering-V Semester

Subject Code	Subject Title	Max Marks	Max Credits
EE5001	Transmission and Distribution	100	3
EE5002	Digital System Design	100	3
EE5003	Electrical Machine Design	100	3
EE5004	Object Oriented Programming	100	3
EE5005	Principles of Management	100	2
EEP005	Object Oriented Programming Lab	100	2
EEP006	Digital System Design Lab	100	2

Electrical and Electronics Engineering-VI Semester

Subject Code	Subject Title	Max Marks	Max Credits
EE6001	Power Systems Analysis	100	3
EE6002	Microprocessor and Microcontrollers	100	3
EE6003	High Voltage Engineering	100	3
EE6004	Protection and Switchgear	100	3
EE6005	Total Quality Management	100	3
EEP007	Microprocessor and Microcontrollers Lab	100	2
EEP008	Communication Skills Lab	100	2

Electrical and Electronics Engineering-VII Semester

Subject Code	Subject Title	Max Marks	Max Credits
EE7001	Principles and Management	100	3
EE7002	Electrical Energy Generation and Utilization	100	3
EE7003	Power System Operation	100	3
	Elective-I	100	3
	Elective-II	100	3
EEP009	Technical Seminar	100	2
EEP010	Power System Lab	100	2

Electrical and Electronics Engineering-VIII Semester

Subject Code	Subject Title	Max Marks	Max Credits
EE8001	Power Electronics	100	3
	Elective-V	100	3
	Elective-VI	100	3
EEP011	Power Electronics Lab	100	2
EEP012	Project	300	6

List of Electives

Subject Code	Subject Title
ETE001	Digital Signal Processing
ETE002	Operating Systems
ETE003	Flexible AC Transmission System
ETE004	Principles of Robotics
ETE005	Embedded Systems
ETE006	VLSI Design
ETE007	Real Time Systems
ETE008	MEMS

SEMESTER : I
Subject Code : BE 1001
Subject Title : English - I

Structure of the Course Content

BLOCK 1 Focus on Language (Grammar)

- Unit 1: Prefixes, Suffixes and Synonyms & Antonyms
- Unit 2: Framing of Questions and Subject Verb and Agreement
- Unit 3: Five Major Pattern and Voice
- Unit 4: Preposition, Phrasal Verbs and Use of Conditionals

BLOCK 2 Reading

- Unit 1: Skimming the Text
- Unit 2: Scanning the Text
- Unit 3: Note Making
- Unit 4: Comprehension

BLOCK 3 Writing

- Unit 1: Definition
- Unit 2: Description
- Unit 3: Process Description
- Unit 4: Formal and Informal Letter Writing

BLOCK 4 Listening

- Unit 1: Extensive Listening
- Unit 2: Intensive Listening
- Unit 3: Note Making
- Unit 4: Inferential Comprehension

BLOCK 5 Speaking

- Unit 1: Developing Confidence & Introducing One self
- Unit 2: Describing Objectives
- Unit 3: Analysing Problem & Providing Solutions
- Unit 4: Expressing Opinions and giving instruction

Books:

1. A.S.Hornby, 'The advanced learners Dictionary of current English', Oxford university
2. Longman Basic English dictionary 1st Edition Pearson Longman
3. Department of Humanities and Social Sciences, Anna University, English for Engineers and Technologists, Vol.1, 2nd Edition, Orient Longman Ltd., 2002.
4. Chellammal, V., Learning to Communicate: A Resource Book for Scientists and Technologists, Allied Pub. Pvt. Ltd., Chennai, 2003.
5. Sharon J. Gerson, Steven M. Gerson, Technical Writing – Process and Product, 3rd Edition, Pearson Education (Singapore) Pvt. Ltd., New Delhi, 2004.
6. Vocabulary in Practice - Part 1 to 4 by Glennis Pye, Cambridge University Press,
7. Learn Correct English by Shiv K. Kumar & Hemalatha Nagarajan, Pearson Longman,
8. Essential English Grammar by Raymond Murphy, Cambridge University Press.
9. Common Errors in English by M.Thomas, Lotus Press, New Delhi, 2006
10. Basic English Usage by Michael Swan, ELBS/OUP, 1989

SEMESTER : I
Subject Code : BE 1002
Subject Title : Mathematics - I

Structure of the Course Content

BLOCK 1 Matrices

- Unit 1: Rank of a matrix – Consistency of linear system of equations
- Unit 2: Eigen value problem
- Unit 3: Cayley –Hamilton theorem
- Unit 4: Orthogonal matrices – Orthogonal transformation of a symmetric Matrix

BLOCK 2 Three Dimensional Analytical Geometry

- Unit 1: Direction cosines and ratios – Angle between two lines
- Unit 2: Equations of a plane – Equations of a straight line – Coplanar lines
- Unit 3: Shortest distance between skew lines – Sphere – Tangent plane
- Unit 4: Plane section of a sphere – Orthogonal spheres

BLOCK 3 Geometrical Applications Of Differential Calculus

- Unit 1: Curvature – Cartesian and polar co-ordinates
- Unit 2: Centre and radius of curvature
- Unit 3: Circle of curvature
- Unit 4: Involutives and evolutes – Envelopes

BLOCK 4 Functions Of Several Variables

- Unit 1: Functions of two variables – Partial derivatives – Total differential
- Unit 2: Taylor’s expansion, Maxima and minima
- Unit 3: Lagrange’s Multiplier method – Jacobians
- Unit 4: Differentiation under integral sign.

BLOCK 5 Ordinary Differential Equations

- Unit 1: Simultaneous first order linear equations with constant coefficients
- Unit 2: Linear equations of second order with constant and variable coefficients
- Unit 3: Homogeneous equations of Euler type
- Unit 4: Equations reducible to homogeneous form, Method of variation of Parameters

Books:

1. Veerarajan,T., “Engineering Mathematics,” Second Edition , Tata McGraw–Hill Pub. Co.
2. Venkataraman, M.K., “Engineering Mathematics, Volume I,” Fourth Edition, The National Pub. Co., Chennai, 2003.
3. Kreyszig, E., “Advanced Engineering Mathematics”, Eighth Edition, John Wiley and Sons (Asia) Ltd., Singapore, 2001.
4. Grewal, B.S., “Higher Engineering Mathematics”, Thirty Sixth Edition, Khanna Publish.
5. Kandasamy, P., Thilagavathy, K., and Gunavathy, K., “Engineering Mathematics” Volume I, Fourth Revised Edition, S. Chand & Co., New Delhi, 2000.
6. Widder, D.V. “Advanced Calculus”, Second Edition, Prentice Hall of India, New Delhi,
7. Engineering Mathematics Vol-III by Dr. B. Krishna Gandhi , Dr. T.K.V Iyengar, S.Ranganatham, , S.Chand & Co, New Delhi
8. Introduction to Engineering Mathematics by H.K. Dass, Dr.Rama Verma, S.Chand & Co,
9. Applied Engineering Mathematics Vol-II by H.K.Dass, S.Chand & Co.
10. Advanced Engineering Mathematics by N.Bali,M.Goyal,C.Watkins, Lakshmi

SEMESTER : I
Subject Code : BE 1003
Subject Title : Engineering Physics - I

Structure of the Course Content

BLOCK 1 Acoustics and Ultrasonic

- Unit 1: Sound and Weber Fechner law
- Unit 2: Factors affecting acoustics of buildings
- Unit 3: Ultrasonic production
- Unit 4: SONAR, Measurement of velocity of blood flow & movement of heart

BLOCK 2 Crystallography & Non-Destructive Testing

- Unit 1: Space lattice, unit cell, Bravais space lattices, Lattice planes
- Unit 2: Miller indices Calculation of number of atoms per unit cell, Atomic Radius
- Unit 3: coordination number & packing factor for simple cubic
- Unit 4: NDT methods

BLOCK 3 Wave Optics

- Unit 1: Air wedge and testing of flat surfaces
- Unit 2: Michelson interferometer, Types of fringes
- Unit 3: Theory of plane and Photo elasticity
- Unit 4: Isoclinic and iso-chromatic fringes – Photo elastic bench

BLOCK 4 Quantum Physics

- Unit 1: Planck's quantum theory of black body radiation, Photo electric effect
- Unit 2: Compton effect
- Unit 3: Schrödinger wave equation
- Unit 4: Physical significance of wave function & electrons in a metal

BLOCK 5 Laser & Fibre Optics

- Unit 1: Einstein's coefficients and Laser
- Unit 2: Material processing, CD-ROM & Holography
- Unit 3: Optical fibre
- Unit 4: Fibre optics communication system

Books:

1. Rajendran V. and Marikani A., Applied Physics for Engineers, 3rd Edition, Tata McGraw–Hill Publishing Company Limited, New Delhi, 2003.
2. Arumugam M., Engineering Physics, 5th Edition, Anuradha Agencies, Kumbakonam,
3. Palanisamy P.K., Physics for Engineers, Vol.1 & Vol.2, 2nd Edition, Scitech Publications,
4. Gaur R.K. and Gupta S.L., Engineering Physics, 8th edition, Dhanpat Rai Publications
5. Uma Mukherji, Engineering Physics, Narosa Publishing House, New Delhi, 2003.
6. Modern Engineering Physics by A.S.Vasudeva, S. Chand Publishers, New Delhi
7. Engineering Physics Fundamentals & Modern Applications by P.Khare and A.Swarup, Lakshmi Publications (Pvt) Ltd, New Delhi
8. Engineering Physics by Dipak Chandra Ghosh, Nipesh Chandra chosh, Prabir Kumar Haldar, Lakshmi Publications (Pvt) Ltd, New Delhi
9. Engineering Physics by Vikram Yadav, Tata McGraw Hill, New Delhi
10. Schaum's Outline of Physics for Engineering and Science by Michael Browne, Tata

SEMESTER : I
Subject Code : BE 1004
Subject Title : Engineering Chemistry - I

Structure of the Course Content

BLOCK 1 Electro Chemistry

- Unit 1: Galvanic cells – reversible and irreversible cells
- Unit 2: Single electrode potential, standard electrodes, electrochemical series
- Unit 3: Nernst equation and Metal
- Unit 4: Glass electrode, concentration cells and Kohlrausch law

BLOCK 2 Thermodynamics

- Unit 1: Thermodynamic terms – definition of system
- Unit 2: Thermodynamic equilibrium
- Unit 3: Law of thermodynamics
- Unit 4: Entropy of phase transitions, Gibbs Helmholtz equation

BLOCK 3 Chemical Kinetics

- Unit 1: Kinetics of second order reaction
- Unit 2: Kinetics of opposing, parallel and consecutive reactions
- Unit 3: Decomposition of diethyl ether in gaseous phase – radioactive decay of polonium
- Unit 4: Effect of temperature on reaction rate – theory of absolute reaction rate

BLOCK 4 Surface Chemistry And Catalysis

- Unit 1: Adsorption
- Unit 2: Freundlich, Langmuir isotherms
- Unit 3: Catalysis
- Unit 4: Michaelis – Menton equation – acid base catalysis

BLOCK 5 Spectroscopy

- Unit 1: Electromagnetic spectrum
- Unit 2: Electronic transition, Vibrational transition and rotational transition
- Unit 3: Lambert's Law –colorimetric analysis – estimation of concentration of a solution by colorimetry
- Unit 4: Visible & UV spectroscopy, IR spectroscopy

Books:

1. Puri B.R., Sharma L.R. and Madan S. Pathania, Principles of Physical Chemistry, Shoban Lal Nagin Chand & Co., Jalandhar, 2000.
2. Jain P.C and Renuka Jain, Physical Chemistry for Engineers, Dhanpat Rai & Sons, Delhi
3. Bahl B.S., Tuli G.D., and Arun Bahl, Essentials of Physical Chemistry, S.Chand& Co.
4. Kuriacose J.C. & Rajaram J, Chemistry in Engineering & Technology, Vol. 1, Tata McGraw
5. Introduction to Engineering Chemistry by Minaxi B Lohani, Upma Misra, S.Chand & Co, New
6. Engineering Chemistry by Dr.A.K.Pahari,Dr.B.S.Chauhan, Lakshmi Publications (Pvt) Ltd,
7. Advanced Engineering Chemistry by M.Senapati, Lakshmi Publications (Pvt) Ltd, New Delhi
8. Engineering chemistry by Uppal , Khanna publishers
9. Environmental chemistry &Pollution control by Dara .SS, S. Chand&co
10. Environmental Pollution by, Tripathy .SN , Sunakar panda - Vrinda publication

SEMESTER : I
Subject Code : BE 1005
Subject Title : Fundamentals of Computing and Programming

Structure of the Course Content

BLOCK 1 Introduction to Computer

- Unit 1: Introduction, Evaluation and generation of Computer
- Unit 2: Classification of Computers
- Unit 3: Basic Computer organization
- Unit 4: Number Systems

BLOCK 2 COMPUTER ARITHMETIC AND SOFTWARE

- Unit 1: Computer Codes
- Unit 2: Computer Arithmetic
- Unit 3: Computer Software
- Unit 4: Logical System Architecture – Software Development Steps

BLOCK 3 PROBLEM SOLVING AND OFFICE AUTOMATION

- Unit 1: Planning the Computer Program – Purpose
- Unit 2: Algorithm – Flow Charts – Pseudocode
- Unit 3: Application Software Packages- Word Processing – Spreadsheet
- Unit 4: Graphics – Personal Assistance.

BLOCK 4 INTRODUCTION TO C

- Unit 1: Overview of C – Constants, Variables and Data Types
- Unit 2: Operators and Expression – Managing Input and Output Operators
- Unit 3: Decision Making and Branching
- Unit 4: Decision Making and Looping

BLOCK 5 FUNCTIONS AND POINTERS

- Unit 1: Arrays – Handling of Character Strings
- Unit 2: User-Defined Functions- Structures and Unions
- Unit 3: Pointers
- Unit 4: Developing a C Programs

Books:

1. Pradeep K.Sinha and Priti Sinha, “Computer Fundamentals: Concepts, Systems and Applications”, BPB Publications, 2003.
2. E.Balagurusamy, “Programming in ANSI C”, TMH, New Delhi, 2002.
3. Allen B.Tucker et.al, “Fundamentals of Computing I”, TMH New Delhi, 1998.
4. V.Rajaraman, “Fundamentals of Computers”, Prentice-Hall of India, 2002.
5. Herbert Schidt, “C Made Easy”, McGraw-Hill.

SEMESTER : I
Subject Code : BE 1006
Subject Title : Physics & Chemistry Laboratory
Structure of the Course Content

Practical

List of Experiments for Physics

1. Torsional Pendulum – determination of rigidity modulus of wire and moment of inertia of disc.
2. Non Uniform Bending - Young modulus determination
3. Viscosity –Determination of co-efficient of Viscosity of liquid by Poiseuilles flow
4. Lee’s disc – Determination of thermal conductivity of a bad conductor
5. Air wedge – Determination of thickness of a thin wire
6. Newton rings – Determination of Focal length of a lens
7. Spectrometer – Dispersive power of a prism
8. Determination of wavelength of Laser using Grating and Particle size determination.

List of Experiments Chemistry

I. Weighing and preparation of standard solutions

1. Preparation of molar and normal solutions of the following substances - oxalic acid, sodium carbonate, sodium hydroxide, hydrochloric acid.
2. Preparation of buffer solutions: borate buffer, phosphate buffer using Henderson equation.

II. Water Analysis

1. Determination of total hardness, temporary & permanent hardness of water by EDTA method.
2. Determination of DO content by Winkler’s method.
3. Determination of alkalinity in a water sample.
4. Determination of chloride content of water sample by argentometric method.

III. Conductometry

1. Conduct metric titration of mixture of acids.
2. Conduct metric precipitation titration using $\text{BaCl}_2 - \text{Na}_2\text{SO}_4$.

SEMESTER : I
Subject Code : BE 1007
Subject Title : Computer Application Lab
Structure of the Course Content

Practical

MS-OFFICE

a) Word Processing

1. Document creation, Text manipulation with Scientific notations.
2. Table creation, Table formatting and Conversion.
3. Mail merge and Letter preparation.
4. Drawing - flow Chart

b) Spread Sheet

1. Chart - Line, XY, Bar and Pie.
2. Formula - formula editor.
3. Spread sheet - inclusion of object, Picture and graphics, protecting the document and sheet.
4. Sorting and Import / Export features.

C Programming

1. Data types, Expression Evaluation, Condition Statements.
2. Functions, Recursion and parameter passing mechanisms.
3. Arrays
4. Structures and Unions
5. Pointers and Functions
6. File Processing
7. Dynamic allocation & Linked List

SEMESTER : II
Subject Code : BE 2001
Subject Title : Technical English

Structure of the Course Content

BLOCK 1 Focus on Language

- Unit 1: Cause and Effect Expression
- Unit 2: Connectives & Imperative and Modal Verbs
- Unit 3: Infinitives, Gerunds and Reporting Verbs
- Unit 4: Varied Grammatical Functions of the same word

BLOCK 2 Reading

- Unit 1: Reading Comprehension
- Unit 2: Guided note Making
- Unit 3: Evaluating the style
- Unit 4: Cloze Reading

BLOCK 3 Writing

- Unit 1: Formal Letter Writing
- Unit 2: Technical Report
- Unit 3: Industrial Report
- Unit 4: Project Proposal

BLOCK 4 Listening

- Unit 1: Listening for global Comprehension and Specification information
- Unit 2: Listening to speech Segments
- Unit 3: Listening to recorded telephonic conversation
- Unit 4: Listening to Short and Long conversion

BLOCK 5 Speaking

- Unit 1: Activities related to professional skills
- Unit 2: Role plays activities and Conversational etiquette
- Unit 3: Group discussion & Mock interview
- Unit 4: Academic skills

Books:

1. A.S.Hornby, 'The advanced learners Dictionary of current English', Oxford university press.
2. Longman Basic English dictionary 1st Edition Pearson Longman
3. Department of Humanities and Social Sciences, Anna University, English for Engineers and Technologists, Vol.2, Orient Longman Ltd., 2002, 2nd Edition.
4. T M Farhathullah, Communication Skills for Technical Students, Orient Longman Ltd., 2002.
5. Andrea J. Rutherford, Basic Communication Skills for Technology, 1st Edn., Pearson Education Asia (Singapore) Pvt. Ltd., Bangalore, 2001.
6. Vocabulary in Practice - Part 1 to 4 by Glennis Pye, Cambridge University Press,
7. Learn Correct English by Shiv K. Kumar & Hemalatha Nagarajan, Pearson Longman,
8. Essential English Grammar by Raymond Murphy, Cambridge University Press.
9. Common Errors in English by M.Thomas, Lotus Press, New Delhi, 2006
10. Basic English Usage by Michael Swan, ELBS/OUP, 1989

SEMESTER : II
Subject Code : BE 2002
Subject Title : Mathematics - II

Structure of the Course Content

BLOCK 1 Multiple Integrals

- Unit 1: Double integration – Cartesian and polar coordinates
- Unit 2: Change of order of integration – Area as a double integral
- Unit 3: Triple integration in Cartesian coordinates
- Unit 4: Change of variables between Cartesian and polar coordinates

BLOCK 2 Vector Calculus

- Unit 1: Gradient, divergence and curl
- Unit 2: Line, surface and volume integrals
- Unit 3: Green's, Gauss divergence
- Unit 4: Stoke's theorems

BLOCK 3 Analytic Functions

- Unit 1: Function of a complex variable – Analytic function
- Unit 2: Cauchy, Riemann equations in Cartesian coordinates
- Unit 3: Determination of harmonic conjugate by Milne – Thomson method
- Unit 4: Conformal mapping and bilinear transformation.

BLOCK 4 Complex Integration

- Unit 1: Cauchy's theorem and Cauchy's integral formula
- Unit 2: Taylor and Laurent expansion – Singularities
- Unit 3: Residues – Cauchy's residue theorem
- Unit 4: Contour integration – Unit circle and semi-circular contours

BLOCK 5 Laplace Transform

- Unit 1: Transforms of elementary functions – Basic properties
- Unit 2: Inverse transforms
- Unit 3: Derivatives and integrals of transforms
- Unit 4: Convolution theorem – Transform of periodic functions

Books:

1. Grewal, B.S., "Higher Engineering Mathematics", Thirty Sixth Edition, Khanna Delhi,
2. Kreyzig, E., "Advanced Engineering Mathematics", Eighth Edition, John Wiley & Sons
3. Narayanan, S., Manicavachagom Pillay, T.K. and Ramaniah, G., "Advanced Mathematics for Engineering Students", Volumes I and III, S. Viswanathan (Printers and Publishers)
4. Grewal, B.S., "Higher Engineering Mathematics", Thirty Sixth Edition, Khanna, Delhi,
5. Kandasamy, P., Thilagavathy, K., and Gunavathy, K., "Engineering Mathematics" Volume II, Fourth Revised Edition, S. Chand & Co., New Delhi, 2000.
6. Widder, D.V. "Advanced Calculus", Second Edition, Prentice Hall of India, New Delhi,
7. Engineering Mathematics Vol-III by Dr. B. Krishna Gandhi , Dr. T.K.V Iyengar, S.Ranganatham, , S.Chand & Co, New Delhi
8. Veerarajan,T., "Engineering Mathematics (for First Year)," Second Edition ,Tata Mc Hill
9. Venkataraman, M.K., "Engineering Mathematics, Volume II," Fourth Edition, The National Pub. Co., Chennai, 2003.
10. Kreyszig, E., "Advanced Engineering Mathematics", Eighth Edition, John Wiley and

SEMESTER : II
Subject Code : BE 2003
Subject Title : Engineering Physics - II

Structure of the Course Content

BLOCK 1 Crystal Defects

Unit 1: Crystal imperfection – point defects-line defects

Unit 2: Dislocations

Unit 3: Burger Vector – Dislocation climb

Unit 4: Strengthening mechanisms for the improvement of mechanical Properties

BLOCK 2 Conducting and Semi conducting Materials

Unit 1: Drawbacks of classical theory- Fermi distribution function

Unit 2: Origin of band gap in solids, Concept of effective mass of electron and hole

Unit 3: Types of Semiconductor

Unit 4: Hall effect

BLOCK 3 Magnetic and Dielectric Materials

Unit 1: Origin of magnetic moment – Bohr magneton

Unit 2: Weiss theory of Para magnetism, Determination of paramagnetic Substance

Unit 3: Ferromagnetism, Anti-ferromagnetic materials and Ferrites magnetic

Unit 4: Storage of magnetic data

BLOCK 4 Nuclear Physics

Unit 1: Nuclear forces – Einstein’s mass energy relation– binding energy

Unit 2: Nuclear fission

Unit 3: Nuclear reactor

Unit 4: Nuclear power station

BLOCK 5 New Engineering Materials

Unit 1: Superconducting

Unit 2: Meissner effect, Isotope effect

Unit 3: Magnetic levitation and SQUIDS - Metallic glasses

Unit 4: Nano phase materials

Books:

1. Arumugam M, Materials Science, 3rd Edition, Anuradha Agencies, Kumbakonam, 2003.
2. Srivastava C.M. and Srinivsan C, Science of Engineering Materials, 2nd Edition, New Age International (P) Ltd, Publications, New Delhi, 1997.
3. Rajendran V. and Marikani A., Applied Physics for Engineers, 3rd Edition, Tata McGraw.
4. Palanisamy, P.K., Materials Science, 2nd Edition, Scitech Publications (India), Pvt. Ltd.,
5. Murthy V.S.R., Jena AK, Gupta K.P. and Murthy G.S., Structure and Properties of Engineering Materials, Tata McGraw-Hill Publishing Company Ltd, New Delhi, 2003.
6. Kenneth G. Budinski, Michel K. Budinski, Engineering Materials Properties and Selection, 7th Edition, Pearson, Singapore (Prentice Hall), 2002.
7. Vasudeva A.S., Modern Engineering Physics, 2nd Edition, S.Chand & Co. Ltd., 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 chosh, Prabir Kumar

SEMESTER : II
Subject Code : BE 2004
Subject Title : Engineering Chemistry - II

Structure of the Course Content

BLOCK 1 Fuels And Combustion

- Unit 1: Classification of fuels
- Unit 2: Coal varieties, coke and cracking
- Unit 3: Synthetic petrol and Fischer
- Unit 4: Gaseous fuels

BLOCK 2 Mechanical Engineering Materials

- Unit 1: Abrasives
- Unit 2: Refractories
- Unit 3: Lubricants
- Unit 4: Polymer blends and alloys

BLOCK 3 Water Technology And Corrosion

- Unit 1: Corrosion
- Unit 2: Sacrificial anode - boiler feed water
- Unit 3: Boiler compounds – caustic embrittlement – boiler corrosion
- Unit 4: Priming and foaming – desalination by reverse osmosis

BLOCK 4 Phase Rule And Physical Metallurgy

- Unit 1: Phase rule
- Unit 2: Thermal analysis
- Unit 3: Physical metallurgy - powder metallurgy
- Unit 4: Mixing and blending – compacting – sintering

BLOCK 5 Analytical Techniques

- Unit 1: Gravimetry analysis of Pb, Fe, Al, and Ni - complex metric titrations
- Unit 2: Estimation of Ni, Zn, and Mg - redox titrations
- Unit 3: Estimation of iron by dichrometry and copper by iodometry
- Unit 4: Atomic absorption spectroscopy, quantitative estimation of Ni and Cr.

Books:

1. Jain P.C. and Monika Jain, Engineering Chemistry, Dhanpat Rai Pub. Co. (P) Ltd., New Delhi, Edition 2002.
2. Dara S.S., A text book of Engineering Chemistry, S. Chand Co. (P) Ltd., New Delhi, 2003.
3. Vogel A.I., A text book Quantitative Inorganic Analysis, ELBS, London, 2000.
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,

SEMESTER : II
Subject Code : BE 2005
Subject Title : Engineering Graphics

Structure of the Course Content

BLOCK 1 Projection of Points, Lines And Surfaces

- Unit 1: General principles of presentation of technical drawings as per BIS
- Unit 2: First angle projection. And Orthographic projection of points
- Unit 3: Projections of straight lines located in first quadrant only
- Unit 4: Projections of plane surfaces like polygonal lamina and circular lamina

BLOCK 2 Projections of Solids

- Unit 1: Projection of simple prism
- Unit 2: Projection of simple pyramid
- Unit 3: Projection of simple cylinder
- Unit 4: Projection of simple cone

BLOCK 3 Sections of Solids and Development

- Unit 1: Sectioning of simple prisms
- Unit 2: Sectioning of simple pyramids
- Unit 3: Sectioning of simple cylinder
- Unit 4: Sectioning of simple cone and sphere

BLOCK 4 Pictorial Projections

- Unit 1: Isometric views of simple truncated prisms
- Unit 2: Isometric views of pyramids
- Unit 3: Isometric views of cylinders
- Unit 4: Isometric views of cones

BLOCK 5 Free-Hand Sketching

- Unit 1: Free hand sketching techniques
- Unit 2: sketching of orthographic views
- Unit 3: Hand dimensioning.
- Unit 4: Sketching pictorial views from given orthographic views.

Books:

1. Natarajan K.V, "Engineering Drawing and Graphics ", Private Publisher, Chennai.
2. Venugopal K., "Engineering Graphics", New Age International (P) Limited, 2002.
3. Bertoline and Wiebe, Fundamentals of Graphics Communication, Third edition, McGraw-
4. Warren J. Luzadder and Jon. M.Duff, "Fundamentals of Engineering Drawing", Prentice Hall of India Pvt. Ltd., Eleventh Edition, 2001.
5. Gopalakrishna K.R., "Engineering Drawing (Vol. I & II)", Subhas Publications, 1998.
6. Engineering Drawing by Shah/Rana, Ist Edition Pearson Longman
7. Machine Drawing with AutoCAD by Pohit/Ghosh, Ist Edition Pearson Longman
8. Engineering Graphics by Prof.P.J.Shah, S.Chand & Co, New Delhi

Standards :

1. IS 10711 - 2001 Technical Product Documentation - Sizes of drawing sheets
2. IS 9609 - 1983 Lettering on technical drawings
3. IS 10714 - 1983 General Principles of presentation of technical drawings

SEMESTER : II
Subject Code : BE 2006
Subject Title : Computer Application Lab - II
Structure of the Course Content

Practical

1. UNIX COMMANDS

(i) Study of Unix OS - Basic Commands - Process Management Commands - Unix Editor

2. SHELL PROGRAMMING

(i) Simple Shell program - Conditional Statements - Testing and Loops

(ii) Commands line substitution

3. C PROGRAMMING AND FILE MANAGEMENT

(i) C Program to implement Unix Commands

4. PROCESS MANAGEMENT AND SIGNAL HANDLING

(i) Programs in C for signal handling and Process management

SEMESTER : II
Subject Code : BE 2007
Subject Title : Engineering Practices Laboratory
Structure of the Course Content

Practical

1. CIVIL ENGINEERING PRACTICE

Plumbing

Basic pipe connections involving the fittings like valves, taps

Wood Work

Sawing, planing, making common joints: T-Joint, Dovetail joint.

2. ELECTRICAL ENGINEERING PRACTICE

Basic household wiring using switches, fuse, indicator-lamp, Tube Light

3. MECHANICAL ENGINEERING PRACTICE

Welding

Arc welding of butt joints, lap joints, tee joints.

Basic Machining

Simple turning, and drilling operations

4. ELECTRONIC ENGINEERING PRACTICE

Soldering simple electronic circuits and checking continuity

SEMESTER : III
Subject Code : EE3001
Subject Title : Engineering Mathematics

Structure of the Course Content

BLOCK 1 PARTIAL DIFFERENTIAL EQUATIONS

- Unit 1: Formation of partial differential equations
- Unit 2: Solution of standard types of first order partial differential equations
- Unit 3: Lagrange's linear equation
- Unit 4: Linear partial differential equations of second and higher order

BLOCK 2 Fourier Series

- Unit 1: General Fourier series – Odd and even functions
- Unit 2: Half range Sine and Cosine series
- Unit 3: Complex form of Fourier series
- Unit 4: Parseval's identify and Harmonic Analysis

BLOCK 3 Boundary value problems

- Unit 1: Second order quasi linear partial differential equations
- Unit 2: One dimensional wave and heat equation
- Unit 3: Steady state solution of two-dimensional heat equation
- Unit 4: Fourier series solutions in Cartesian coordinates

BLOCK 4 Fourier Transform

- Unit 1: Fourier integral theorem (without proof) and Fourier transform pair
- Unit 2: Sine and Cosine transforms – Properties
- Unit 3: Transforms of simple functions
- Unit 4: Convolution theorem and Parseval's identity

BLOCK 5 Z -Transform and Difference Equations

- Unit 1: Z-transform - Elementary properties
- Unit 2: Inverse Z – transform
- Unit 3: Convolution theorem
- Unit 4: Formation of difference equations

Books:

1. Grewal, B.S., "Higher Engineering Mathematics", Thirty Sixth Edition, Khanna Publishers, Delhi, 2001.
2. Kandasamy, P., Thilagavathy, K., and Gunavathy, K., "Engineering Mathematics Volume III", S. Chand & Company Ltd., New Delhi, 1996.
3. Wylie C. Ray and Barrett Louis, C., "Advanced Engineering Mathematics", Sixth Edition, McGraw-Hill, Inc., New York, 1995
4. Andrews, L.A., and Shivamoggi B.K., "Integral Transforms for Engineers and Applied Mathematicians," Macmillen , New York ,1988.
5. Narayanan, S., Manicavachagom Pillay, T.K. and Ramaniah, G., "Advanced Mathematics for Engineering Students", Volumes II and III, S. Viswanathan (Printers and Publishers) Pvt. Ltd. Chennai, 2002.
6. Churchill, R.V. and Brown, J.W., "Fourier Series and Boundary Value Problems", Fourth Edition, McGraw-Hill Book Co., Singapore, 1987

SEMESTER : III
Subject Code : EE3002
Subject Title : Electrical Circuit Theory

Structure of the Course Content

BLOCK 1 Basic Circuit Concepts

- Unit 1: Basic Laws
- Unit 2: R, L, C Circuits
- Unit 3: Network Reduction Methods
- Unit 4: Mesh and Nodal Methods

BLOCK 2 AC Fundamentals

- Unit 1: AC Quantity, Phasor Representation
- Unit 2: Steady State Analysis of Series circuit
- Unit 3: Steady State Analysis of Parallel circuit
- Unit 4: Resonance Circuits

BLOCK 3 Network Theorems

- Unit 1: Superposition Theorem and Thevenin's Theorem
- Unit 2: Norton's Theorem and Maximum Power Transfer Theorem
- Unit 3: Reciprocity Theorem and Compensation Theorem
- Unit 4: Substitution Theorem and Millman's Theorem

BLOCK 4 Three Phase Circuits

- Unit 1: Three Phase Systems
- Unit 2: Phasor Diagrams
- Unit 3: Problems in Balanced Circuits
- Unit 4: Power Measurement

BLOCK 5 Coupled Circuits

- Unit 1: Inductance Circuits
- Unit 2: Coupling Circuits
- Unit 3: Ideal Transformer Circuits
- Unit 4: Tuned Circuits

Books:

1. Electric Circuit Theory By Dr M. Arumugam, Dr N. Premkumar, Khanna Publishers
2. Electric Circuits By Joseph Edminister, Schaum Series
3. Circuits and Networks by A. Sudhakar, Shyammohan S Palli, Tata MC Publishers
4. Engineering Circuit Analysis by W H Hayt, J E Kemmerly, S M Durbin, TMC
5. Fundamental of Electric Circuits by Charles Alexandar, Matthew Sadiku, TMC
6. Electrical Networks by Ravish R Singh, Tata MC Publishers
7. Electric Circuits by N Nahvi, J A Edminister, K Uma Rao, Tata MC Publishers
8. Networks Analysis and Synthesis by S P Ghosh, A K Chakraborty, Tata MC
9. Electric Circuit Analysis by T V Narmadha, Lakshmi Publications Pvt Ltd, New Delhi
10. Electrical and Electronics Engineering by Vikramadithya Dave, Lakshmi Publications Pvt Ltd, New Delhi

SEMESTER : III
Subject Code : EE3003
Subject Title : Electronic Devices and Circuits

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 Publication
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 : EE3004
Subject Title : Electrical Machines-I

Structure of the Course Content

BLOCK 1 Electromagnetism

- Unit 1: Basic Laws
- Unit 2: Storage Elements
- Unit 3: Self Inductance
- Unit 4: Mutual Inductance

BLOCK 2 Transformers

- Unit 1: Principle of working
- Unit 2: Phase Diagram
- Unit 3: Losses and Efficiency
- Unit 4: Three Phase Transformer

BLOCK 3 DC Generators

- Unit 1: Principle of working
- Unit 2: Load Characteristics
- Unit 3: Losses and Efficiency
- Unit 4: Applications of DC Generators

BLOCK 4 DC Motor

- Unit 1: Principle of working
- Unit 2: Load Characteristics
- Unit 3: Losses and Efficiency
- Unit 4: Speed Control and Applications of DC Motors

BLOCK 5 Testing of DC Machines and Transformer

- Unit 1: Brake Test, Swinburne's Test
- Unit 2: Retardation Test and Hopkinson's Test
- Unit 3: Polarity Test, Load Test
- Unit 4: Open Circuit and Short Circuit Tests

Books :

- 1.A Course in Electrical Engg (Vol II) By BL Theraja, S.Chnad Publishers
- 2.Electrical Technology By JB Gupta, S.K. Kataria & Sons
- 3.Electrical Technology by Edward Hughes, English Language BookSociety, Longman, England
- 4.Operation & Maintenance Electrical Equipment by B.V.S. Rao, Media Promoters &Publishers Pvt. Ltd., Bombay
- 5.Electrical Machines by Bhattacharya, Tata McGraw Hill Co, New Delhi
6. Electrical Energy Systems Theory by Elegerd, Tata McGraw Hill Co, New Delhi
- 7.Electric Machinery by Fitzgerald, Tata McGraw Hill Co, New Delhi
8. Electrical Machines(Sigma Series) by Kothari, Tata McGraw Hill Co, New Delhi
- 9.Electrical Machines by Kothari & Nagarth, Tata McGraw Hill Co, New Delhi
- 10.Direct Current Machines by R.K.Rajput, Lakshmi Publications Pvt Ltd, New Delhi

SEMESTER : III
Subject Code : EE3005
Subject Title : Electromagnetic Theory

Structure of the Course Content

BLOCK 1 STATIC ELECTRIC FIELDS

Unit 1: Introduction to Co-ordinate System

Unit 2: Definition of Curl, Divergence and Gradient – Meaning of Stokes Theorem and Divergence theorem

Unit 3: Coulomb’s Law in Vector Form and Electric Field Intensity

Unit 4: Electric Scalar Potential and Electric Flux Density, Gauss Law

BLOCK 2 STATIC MAGNETIC FIELDS

Unit 1: Biot-Savart Law in vector form – Magnetic Field intensity

Unit 2: Ampere’s circuital law

Unit 3: Lorentz force equation for a moving charge

Unit 4: Magnetic moment – Magnetic Vector Potential

BLOCK 3 ELECTRIC AND MAGNETIC FIELDS IN MATERIALS

Unit 1: Poisson’s and Laplace’s equation

Unit 2: Capacitance

Unit 3: Boundary conditions for electric fields

Unit 4: Inductance

BLOCK 4 TIME VARYING ELECTRIC AND MAGNETIC FIELDS

Unit 1: Faraday’s law – Maxwell’s Second Equation in integral form

Unit 2: Displacement current and Ampere’s circuital law in integral form

Unit 3: Maxwell’s first and Fourth equation in integral form

Unit 4: Poynting Vector and the flow of power

BLOCK 5 ELECTROMAGNETIC WAVES

Unit 1: Wave Equation

Unit 2: Wave equation for a conducting medium

Unit 3: Linear, Elliptical and circular polarization for Wave

Unit 4: normal and oblique incidence for wave

Books:

1. William H.Hayt : “Engineering Electromagnetics” TATA 2003 (Unit I,II,III).
2. E.C. Jordan & K.G. Balmain “Electromagnetic Waves and Radiating Systems.” Prentice Hall of India 2nd edition 2003. (Unit IV, V). McGraw-Hill, 9th reprint
3. Ramo, Whinnery and Van Duzer: “Fields and Waves in Communications Electronics” John Wiley & Sons (3rd edition 2003)
4. .Narayana Rao, N : “Elements of Engineering Electromagnetics” 4th edition, Prentice Hall of India, New Delhi, 1998.
5. M.N.O.Sadiku: “Elements of Engineering Electromagnetics” Oxford University Press, Third edition.
6. David K.Cherp: “Field and Wave Electromagnetics - Second Edition-Pearson Edition.
7. David J.Grithiths: “Introduction to Electrodynamics- III Edition-PHI.

SEMESTER : III
Subject Code : EEP001
Subject Title : Electronic Devices Lab
Structure of the Course Content

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 : EEP002
Subject Title : Electrical Machines –I Lab
Structure of the Course Content

AIM

To expose the students to the operation of D.C. machines and transformers and give them experimental skill.

1. Open circuit and load characteristics of D.C separately and self excited shunt generator
2. Load characteristics of D.C. compound generator with differential and cumulative connection
3. Load characteristics of D.C. shunt and compound motor
5. Load characteristics of D.C series motor
6. Swinburne's test and speed control of D.C shunt motor
7. Hopkinson's test on D.C motor – generator set
7. Load test on single-phase transformer and three phase transformer connections
8. Open circuit and short circuit tests on single phase transformer
9. Sumpner's test on transformers
10. Separation of no-load losses in single phase transformer

SEMESTER : IV
Subject Code : EE4001
Subject Title : Control Systems

Structure of the Course Content

BLOCK 1 SYSTEMS AND THEIR REPRESENTATION

- Unit 1: Basic elements in control systems
- Unit 2: Electrical analogy of mechanical and thermal systems
- Unit 3: Transfer function – Synchros
- Unit 4: Block diagram reduction techniques – Signal flow graphs

BLOCK 2 TIME RESPONSE

- Unit 1: Time response – Time domain specifications
- Unit 2: I and II order system response – Error coefficients
- Unit 3: Generalized error series – Steady state error
- Unit 4: P, PI, PID modes of feedback control.

BLOCK 3 FREQUENCY RESPONSES

- Unit 1: Frequency response – Bode plot – Polar plot
- Unit 2: Constant M and N circles – Nichols chart
- Unit 3: Determination of closed loop response from open loop response
- Unit 4: Correlation between frequency domain and time domain specifications

BLOCK 4 STABILITY OF CONTROL SYSTEM

- Unit 1: Characteristics equation – Location of roots in S plane for stability
- Unit 2: Routh Hurwitz criterion
- Unit 3: Root locus construction
- Unit 4: Nyquist stability criterion

BLOCK 5 COMPENSATOR DESIGN

- Unit 1: Lag networks
- Unit 2: Lead networks
- Unit 3: Lag and lead networks
- Unit 4: Compensator design using bode plots

Books:

1. K. Ogata, 'Modern Control Engineering', 4th edition, Pearson Education, New Delhi, 2003 / PHI.
2. I.J. Nagrath & M. Gopal, 'Control Systems Engineering', New Age International Publishers, 2003
3. B.C. Kuo, 'Automatic Control Systems', Prentice Hall of India Ltd., New Delhi, 1995.
4. M. Gopal, 'Control Systems, Principles & Design', Tata McGraw Hill, New Delhi, 2002.
5. M.N. Bandyopadhyay, 'Control Engineering Theory and Practice', Prentice Hall of India, 2003

SEMESTER : IV
Subject Code : EE4002
Subject Title : Measurements and Instrumentation

Structure of the Course Content

BLOCK 1 Fundamental of Measurements

- Unit 1: Functional elements of an instrument
- Unit 2: Static and dynamic characteristics
- Unit 3: Errors in measurement
- Unit 4: Standards and calibration

BLOCK 2 ELECTRICAL AND ELECTRONICS INSTRUMENTS

- Unit 1: Principle and types of analog and digital voltmeters, ammeters, multimeters
- Unit 2: Single and three phase wattmeters and energy meters
- Unit 3: Instrument transformers
- Unit 4: Instruments for measurement of frequency and phase

BLOCK 3 COMPARISON METHODS OF MEASUREMENTS

- Unit 1: D.C & A.C potentiometers
- Unit 2: D.C & A.C bridges, transformer ratio bridges, self-balancing bridges
- Unit 3: Multiple earth and earth loops - Electrostatic and electromagnetic interference
- Unit 4: Grounding techniques

BLOCK 4 STORAGE AND DISPLAY DEVICES

- Unit 1: Magnetic disk and tape – Recorders
- Unit 2: digital plotters and printers
- Unit 3: CRT display, digital CRO
- Unit 4: LED, LCD & dot matrix display

BLOCK 5 TRANSDUCERS AND DATA ACQUISITION SYSTEMS

- Unit 1: Classification of transducers – Selection of transducers
- Unit 2: Resistive, capacitive & inductive transducers
- Unit 3: Piezoelectric, optical and digital transducers
- Unit 4: Elements of data acquisition system – A/D, D/A converters

Books:

1. E.O. Doebelin, 'Measurement Systems – Application and Design', Tata McGraw Hill publishing company, 2003.
2. A.K. Sawhney, 'A Course in Electrical & Electronic Measurements & Instrumentation', Dhanpat Rai and Co, 2004
3. A.J. Bouwens, 'Digital Instrumentation', Tata McGraw Hill, 1997.
4. D.V.S. Moorthy, 'Transducers and Instrumentation', Prentice Hall of India Pvt Ltd, 2003.
5. H.S. Kalsi, 'Electronic Instrumentation', Tata McGraw Hill, 1995.
6. Martin Reissland, 'Electrical Measurements', New Age International (P) Ltd., Delhi, 2001.
7. J. B. Gupta, 'A Course in Electronic and Electrical Measurements', S. K. Kataria & Sons, Delhi, 2003
8. Electronic Measurements and Instrumentations by Oliver, Tata McGraw Hill, New Delhi
9. Instrumentation: Devices and Systems by Rangan, Tata McGraw Hill, New Delhi
10. Basic Electronics and Instrumentations by Saifullah Khalid, Neetu Agarwal, Mukesh Jain, Lakshmi Publications (Pvt) Ltd, New Delhi

SEMESTER : IV
Subject Code : EE4003
Subject Title : Electrical Machines-II

Structure of the Course Content

BLOCK 1 Alternators

- Unit 1: Basic Principle and Working of Alternators
- Unit 2: Types of Alternator
- Unit 3: EMF Equation
- Unit 4: Performance of Alternators

BLOCK 2 Synchronous motor

- Unit 1: Working Principle
- Unit 2: Vector Diagram
- Unit 3: Effect of Change in Excitation
- Unit 4: Power factor improvement

BLOCK 3 Three phase induction motor

- Unit 1: Principle of Operation
- Unit 2: Slip-Torque Characteristics
- Unit 3: Load Test
- Unit 4: Induction generator – Synchronous induction motor.

BLOCK 4 Speed Control of Three Phase Induction Motor

- Unit 1: Need for starting – Types of starters
- Unit 2: autotransformer and star-delta starters
- Unit 3: Speed control – Change of voltage, torque, number of poles and slip
- Unit 4: Cascaded connection – Slip power recovery scheme

BLOCK 5 Single phase motor

- Unit 1: Construction and Principle of Operation
- Unit 2: Split Phase Motor
- Unit 3: Shaded Pole Motor
- Unit 4: Universal Motor

Books :

1. Electrical Machines by SK Bhattacharya, TataMcHill Publishers
2. A Text Book Electrical Technology by BL Theraja, S.Chand Publishers
3. Operation and Maintenance of Electrical Machines by B.V.S. Rao, Khanna Publishers, New Delhi.
4. Electrical Technology by Edward Hughes, Addison – Wesley International Student Edition
5. Performance & Design of AC Machines by MG Say, CBS Publication, New Delhi
6. Electrical Energy Systems Theory by Elegerd, Tata McGraw Hill Co, New Delhi
7. Electric Machinery by Fitzgerald, Tata McGraw Hill Co, New Delhi
8. Electrical Machines(Sigma Series) by Kothari, Tata McGraw Hill Co, New Delhi
9. Electrical Machines by Kothari & Nagarth, Tata McGraw Hill Co, New Delhi
10. Electrical and Electronics Engineering by Vikramaditya Dave, Lakshmi Publications (Pvt) Ltd, New Delhi

SEMESTER : IV
Subject Code : EE4004
Subject Title : Environmental Science

Structure of the Course Content

BLOCK 1 Water

- Unit 1: Water Supply
- Unit 2: Quantity of water
- Unit 3: Collections and conveyance of water
- Unit 4: Quality of water

BLOCK 2 Water Treatments

- Unit 1: Layout of treatment plants
- Unit 2: Filtration
- Unit 3: Treatment processes
- Unit 4: Distribution system

BLOCK 3 Collections and conveyance of sewage

- Unit 1: Definition of terms
- Unit 2: physical and chemical bacteriological BOD, COD
- Unit 3: Estimation of quantity of sewage – problems
- Unit 4: Laying of sewers lines & Sewage pumps

BLOCK 4 Treatments and disposal

- Unit 1: Treatment of sewage
- Unit 2: sedimentation
- Unit 3: Septic tanks
- Unit 4: Disposal of Septic Tank effluent

BLOCK 5 Environmental pollution and control

- Unit 1: Industrial waste
- Unit 2: Treatment Processes
- Unit 3: Water pollution
- Unit 4: Land Pollution
- Unit 5: Control of Air Pollution

Books:

1. Water supply and Sanitary Engineering by S.K. Garg, Kanna publishers, Delhi
2. Water supply and Sanitary Engineering by K.S. Rangwala
3. Water supply and Sanitary Engineering by G.S. Birdie and JS. Birdie, Dhanpat rai Publishers
4. Environmental Studies by Suresh K.Dhamija, S.K.Katarial Sons Delhi
5. Industrial waste water treatment by Rao & Dutta
6. Air pollution by M.N. Rao & H.V. Rao, Tata Mcgrawhill Publishing Company
7. Environmental Engineering by Basak, TMH
8. Principle of Environmental Science by Cunningham, Tata Mcgrawhill Publishing Company
9. Introduction to Environmental Engineering by Davis, TMH
10. Environmental Engineering –I: Water supply Engineering by Dr.B.C.Punmia, Ashok Kumar Jain & Arun Kumar Jain

SEMESTER : IV
Subject Code : EE4005
Subject Title : Communication Engineering

Structure of the Course Content

BLOCK 1 MODULATION SYSTEMS

- Unit 1: Time and frequency domain representation of signals
- Unit 2: amplitude, frequency modulation and demodulation
- Unit 3: super heterodyne radio receiver. Frequency division multiplexing
- Unit 4: Pulse width modulation

BLOCK 2 TRANSMISSION MEDIUM

- Unit 1: Transmission lines – Types, equivalent circuit, losses
- Unit 2: standing waves, impedance matching, bandwidth; radio propagation
- Unit 3: Ground wave and space wave propagation
- Unit 4: critical frequency, maximum usable frequency, path loss, white Gaussian noise

BLOCK 3 DIGITAL COMMUNICATIONS

- Unit 1: Pulse code modulation, time division multiplexing
- Unit 2: digital T-carrier system. Digital radio system
- Unit 3: Digital modulation: Frequency and phase shift keying
- Unit 4: Modulator and demodulator, bit error rate calculation

BLOCK 4 DATA COMMUNICATION AND NETWORK PROTOCOL

- Unit 1: Data Communication codes, error control
- Unit 2: Serial and parallel interface, telephone network
- Unit 3: data modem, ISDN, LAN
- Unit 4: ISO-OSI seven layer architecture for WAN

BLOCK 5 SATELLITE AND OPTICAL FIBRE COMMUNICATIONS

- Unit 1: Orbital satellites, geostationary satellites
- Unit 2: satellite system link models, satellite system link equations
- Unit 3: advantages of optical fibre communication
- Unit 4: Light propagation through fibre, fibre loss, light sources and detectors

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 : IV
Subject Code : EEP003
Subject Title : Control and Instrumentation Lab
Structure of the Course Content

List of Experiments

1. Determination of transfer function parameters of a DC servo motor.
2. Determination of transfer function parameters of AC servo motor.
3. Analog simulation of type-0 and type-1 system.
4. Digital simulation of linear systems.
5. Digital simulation of non-linear systems.
6. Design and implementation of compensators.
7. Design of P, PI and PID controllers.
8. Stability analysis of linear systems.
9. Closed loop control system.
10. Study of synchros
11. Study of displacement and pressure transducers
12. AC bridges.
13. DC bridges.
14. Instrumentation amplifiers.
15. A/D and D/A converters.
16. Study of transients.
17. Calibration of single-phase energy meter.
18. Calibration of current transformer.
19. Measurement of three phase power and power factor.
20. Measurement of iron loss

SEMESTER : IV
Subject Code : EEP004
Subject Title : Electrical Machines –I I Lab
Structure of the Course Content

1. Regulation of three phase alternator by emf and mmf methods
2. Regulation of three phase alternator by ZPF and ASA methods
3. Regulation of three phase salient pole alternator by slip test
4. Measurements of negative sequence and zero sequence impedance of alternators.
5. V and Inverted V curves of Three Phase Synchronous Motor.
6. Load test on three-phase induction motor.
7. No load and blocked rotor test on three-phase induction motor.
8. Separation of No-load losses of three-phase induction motor.
9. Load test on single-phase induction motor
10. No load and blocked rotor test on single-phase induction motor

SEMESTER : V
Subject Code : EE5001
Subject Title : **Transmission and Distribution**

Structure of the Course Content

BLOCK 1 Introduction to Electrical Power System

- Unit 1: Structure of electric power system
- Unit 2: HVDC and EHV AC transmission
- Unit 3: comparison of economics of transmission, performance and reliability
- Unit 4: FACTS

BLOCK 2 TRANSMISSION LINE PARAMETERS

- Unit 1: Parameters of single and three phase transmission lines
- Unit 2: Types of Conductors
- Unit 3: skin and proximity effects
- Unit 4: electrical parameters of 400, 220, 110, 66 and 33 kV lines

BLOCK 3 MODELLING AND PERFORMANCE OF TRANSMISSION LINES

- Unit 1: Classification of lines: Short line, medium line and long line
- Unit 2: transmission efficiency and voltage regulation
- Unit 3: real and reactive power flow in lines: Power-angle diagram
- Unit 4: shunt and series compensation; Ferranti effect and corona loss

BLOCK 4 INSULATORS AND CABLES

- Unit 1: Insulators: Types, voltage distribution in insulator string and grading
- Unit 2: improvement of string efficiency
- Unit 3: Underground cables: Constructional features of LT and HT cables
- Unit 4: capacitance, dielectric stress and grading, thermal characteristics

BLOCK 5 SUBSTATION, GROUNDING SYSTEM AND DISTRIBUTION SYSTEM

- Unit 1: Types of substations; bus-bar arrangements; substation bus schemes
- Unit 2: double bus with single breaker, main and transfer bus
- Unit 3: Resistance of grounding systems
- Unit 4: three-phase, four-wire distribution system

Books:

1. B.R.Gupta, 'Power System Analysis and Design', S.Chand, New Delhi, 2003.
2. S.N. Singh, 'Electric Power Generation, Transmission and Distribution', Prentice Hall of India Pvt. Ltd, New Delhi, 2002
3. Luces M.Fualkenberry ,Walter Coffe, 'Electrical Power Distribution and Transmission', Pearson Education, 1996.
4. Hadi Saadat, 'Power System Analysis,' Tata McGraw Hill Publishing Company', 2003.
5. Central Electricity Authority (CEA), 'Guidelines for Transmission System Planning', New Delhi.

SEMESTER : V
Subject Code : EE5002
Subject Title : Digital System Design

Structure of the Course Content

BLOCK 1 NUMBER SYSTEMS

- Unit 1: Types of Number System and Conversion
- Unit 2: Binary Codes
- Unit 3: Boolean expression and De Morgan's Law
- Unit 4: Minimization of Boolean Expression

BLOCK 2 Logical Gates

- Unit 1: Logics and Basic Gates
- Unit 2: Universal Gates
- Unit 3: Special Gates
- Unit 4: Multi Level Gates

BLOCK 3 Combinational Circuits

- Unit 1: Adder and Subtractors Circuit
- Unit 2: Multiplexer and De-multiplexer
- Unit 3: Encoder, Decoder and Code Conversion
- Unit 4: Implementation of Combinational logic using MUX, ROM, PAL and PLA

BLOCK 4 Sequential Circuits

- Unit 1: Flip Flops
- Unit 2: Counters
- Unit 3: Design of Synchronous and Asynchronous Counter
- Unit 4: State table and State Minimization

BLOCK 5 Memory Devices

- Unit 1: Classification of Memory Devices
- Unit 2: Memory Decoding and Expansion
- Unit 3: RAM and ROM
- Unit 4: PAL and PLA, FPGA

Books:

1. M. Morris Mano, Digital Design, 3.ed., Prentice Hall of India Pvt. Ltd., New Delhi, 2003/Pearson Education (Singapore) Pvt. Ltd., New Delhi, 2003 – (Unit I, II, V)
2. John .M Yarbrough, Digital Logic Applications and Design, Thomson- Vikas publishing house, New Delhi, 2002. (Unit III, IV)
3. S. Salivahanan and S. Arivazhagan, Digital Circuits and Design, 2nd ed., Vikas Publishing House Pvt. Ltd, New Delhi, 2004
4. Charles H.Roth. "Fundamentals of Logic Design", Thomson Publication Company,
5. Donald P.Leach and Albert Paul Malvino, Digital Principles and Applications, 5 ed., Tata McGraw Hill Publishing Company Limited, New Delhi, 2003.
6. R.P.Jain, Modern Digital Electronics, 3 ed., Tata McGraw–Hill publishing company limited, New Delhi, 2003.
7. Thomas L. Floyd, Digital Fundamentals, Pearson Education, Inc, New Delhi, 2003
8. Donald D.Givone, Digital Principles and Design, Tata Mc-Graw-Hill Publishing company limited, New Delhi, 2003.

SEMESTER : V
Subject Code : EE5003
Subject Title : Electrical Machine Design

Structure of the Course Content

BLOCK 1 MAGNETIC CIRCUITS AND COOLING OF ELECTRICAL MACHINES

- Unit 1: MMF calculation for various types of electrical machines
- Unit 2: leakage reactance calculation for transformers, induction machine
- Unit 3: thermal rating: continuous, short time and intermittent rating
- Unit 4: direct and indirect cooling methods – cooling of turbo alternators

BLOCK 2 D.C. MACHINES

- Unit 1: Constructional details – output equation
- Unit 2: choice of number of poles – armature design
- Unit 3: design of field poles and field coil
- Unit 4: losses and efficiency calculations

BLOCK 3 TRANSFORMERS

- Unit 1: Constructional details of core and shell type transformers
- Unit 2: optimum design of transformers
- Unit 3: design of core, yoke and windings for core and shell type transformers
- Unit 4: losses and efficiency calculations

BLOCK 4 THREE PHASE INDUCTION MOTORS

- Unit 1: Constructional details of squirrel cage and slip ring motors – output equation
- Unit 2: choice of specific loadings – design of stator
- Unit 3: design of squirrel cage and slip ring rotor
- Unit 4: losses and efficiency calculations

BLOCK 5 SYNCHRONOUS MACHINES

- Unit 1: Constructional details of cylindrical pole and salient pole alternators
- Unit 2: choice of specific loadings – main dimensions – short circuit ratio
- Unit 3: design of stator and rotor of cylindrical pole and salient pole machines
- Unit 4: design of field coil - performance calculation from designed data

Books:

1. A.K. Sawhney, 'A Course in Electrical Machine Design', Dhanpat Rai and Sons, New Delhi, 1984.
2. S.K. Sen, 'Principles of Electrical Machine Design with Computer Programmes', Oxford and IBH Publishing Co.Pvt Ltd., New Delhi, 1987
3. R.K. Agarwal, 'Principles of Electrical Machine Design', S.K.Kataria and Sons, Delhi, 2002.
4. V.N. Mittle and A. Mittle, 'Design of Electrical Machines', Standard Publications and Distributors, Delhi, 2002

SEMESTER : V
Subject Code : EE5004
Subject Title : Object Oriented Programming

Structure of the Course Content

BLOCK 1 OBJECT ORIENTED PROGRAMMING AND BASICS OF C++

- Unit 1: Object oriented programming paradigm
- Unit 2: Benefits of OOP – Object-oriented languages – Applications of OOP
- Unit 3: Tokens – Keywords – Identifiers and constants – Basic data types
- Unit 4: Operators in C++ – Scope resolution operator –Type cast operator

BLOCK 2 CLASSES AND OBJECTS

- Unit 1: member functions
- Unit 2: Arrays within a class – Memory allocation for objects
- Unit 3: Constructors: Parameterized constructors
- Unit 4: Dynamic constructors – Destructors

BLOCK 3 OPERATOR OVERLOADING, INHERITANCE AND POLYMORPHISM

- Unit 1: operator overloading
- Unit 2: Rules for overloading operators
- Unit 3: inheritance
- Unit 4: pointers

BLOCK 4 JAVA EVOLUTION,

- Unit 1: Java program structures
- Unit 2: Java virtual machine – Command line arguments
- Unit 3: Defining a class – Adding variables and methods – Creating objects
- Unit 4: Arrays

BLOCK 5 PACKAGES, MULTITHREADING

- Unit 1: interfaces – Extending interfaces – Implementing interfaces
- Unit 2: Creating threads – Extending the thread class
- Unit 3: Types of errors: Exceptions – Syntax of exception handling code
- Unit 4: Designing a web page – Applet tag – Adding applet to HTML file

Books:

1. E.Balagurusamy, 'Object Oriented Programming with C++', Second edition, Tata McGraw Hill
2. E.Balagurusamy, 'Programming with JAVA – A Primer', Second edition, Tata McGraw Hill, 2003
3. Herbert Schildt, 'C++ - The Complete Reference', Tata McGraw Hill, 1997.
4. Bjarne Stroustrup, 'The C++ Programming Language', Addison Wesley, 2000.
5. John .R .Hubbard, 'Schaums Outline Programming with C++', Tata McGraw Hill, 2003.
6. Kris Jasma, 'Java Programming – A Complete Reference', Galgotia publication, 1994.

SEMESTER : V
Subject Code : EEP005
Subject Title : Object Oriented Programming Lab
Structure of the Course Content

1. String concatenation using dynamic memory allocation concept.
2. Implementation of arithmetic operations on complex numbers using constructor overloading.
3. To read a value of distance from one object and add with a value in another object using friend function.
4. Implementation of + and - operator overloading and implementation of addition operation of octal object with integer using operator overloading.
5. Implementation of addition and subtraction of two polynomial objects using operator overloading.
6. Managing bank account using inheritance concept.
7. To compute the area of triangle and rectangle using inheritance and virtual function.
8. Writing simple programs in Java.
9. Use of interfaces in Java.
10. Developing packages in Java

SEMESTER : V
Subject Code : EEP006
Subject Title : Digital System Design Lab
Structure of the Course Content

Practical

1. Design and implementation of Adders and Subtractors using logic gates.
2. Design and implementation of code converters using logic gates
 - (i) BCD to excess-3 code and vice versa
 - (ii) Binary to gray and vice-versa
3. Design and implementation of 4 bit binary Adder/ subtractor and BCD adder using IC 7483
4. Design and implementation of 2Bit Magnitude Comparator using logic gates 8 Bit Magnitude Comparator using IC 7485
5. Design and implementation of 16 bit odd/even parity checker generator using IC74180.
6. Design and implementation of Multiplexer and De-multiplexer using logic gates and study of IC74150 and IC 74154
7. Design and implementation of encoder and decoder using logic gates and study of IC7445 and IC74147
8. Construction and verification of 4 bit ripple counter and Mod-10 / Mod-12 Ripple counters
9. Design and implementation of 3-bit synchronous up/down counter
10. Implementation of SISO, SIPO, PISO and PIPO shift registers using Flip- flops

SEMESTER : VI
Subject Code : EE6001
Subject Title : Power Systems Analysis

Structure of the Course Content

BLOCK 1 THE POWER SYSTEM – AN OVERVIEW AND MODELLING

- Unit 1: Modern Power System
- Unit 2: Basic Components of a power system
- Unit 3: Per Phase Analysis Generator model - Transformer model
- Unit 4: line model. The per unit system -Change of base

BLOCK 2 POWER FLOW ANALYSIS

- Unit 1: Introduction - Bus Classification - Bus admittance matrix
- Unit 2: Gauss seidal method
- Unit 3: Newon raphson method
- Unit 4: Fast decoupled method

BLOCK 3 FAULT ANALYSIS-BALANCED FAULT

- Unit 1: Balanced three phase fault
- Unit 2: short circuit capacity
- Unit 3: systematic fault analysis using bus impedance matrix
- Unit 4: algorithm for formation of he bus impedance matrix

BLOCK 4 FAULT ANALYSIS- UNBALANCED FAULT

- Unit 1: Fundamentals of symmetrical components
- Unit 2: sequence impedances – sequence networks
- Unit 3: single line to ground fault – line fault - Double line to ground fault
- Unit 4: Unbalanced fault analysis using bus impedance matrix

BLOCK 5 POWER SYSTEM STABILITY

- Unit 1: Basic concepts and definitions – Rotor angle stability – Voltage stability
- Unit 2: Classification of stability – An elementary view of transient stability
- Unit 3: Equal area criterion
- Unit 4: Numerical integration methods – Euler method – modified Euler method

Books:

1. Hadi Saadat “ Power system analysis”, Tata McGraw Hill Publishing Company, New Delhi, 2002
2. P.Kundur, “Power System Stability and Control”, Tata McGraw Hill Publishing Company, New Delhi, 1994
- 3.I.J.Nagrath and D.P.Kothari, ‘Modern Power System Analysis’, Tata McGraw-Hill publishing company, New Delhi, 1990.
- 4.M.A. Pai, ‘Computer Techniques in power system Analysis’, Tata McGraw – Hill publishing company, New Delhi, 2003

SEMESTER : VI
Subject Code : EE6002
Subject Title : Microprocessor and Microcontrollers

Structure of the Course Content

BLOCK 1 8085 CPU

Unit 1: 8085 Architecture
Unit 2: Instruction set and Addressing modes
Unit 3: Timing Diagram
Unit 4: I/O, Time delay, Counter and Interrupt Program

BLOCK 2 PERIPHERALS INTERFACING

Unit 1: Interfacing of 8255
Unit 2: Interfacing of Key board and Display
Unit 3: Interfacing of ADC & DAC
Unit 4: Serial and Parallel Port Communications

BLOCK 3 8086 CPU

Unit 1: Intel 8086 Architecture
Unit 2: 80806 Addressing Modes
Unit 3: Instruction Sets and Simple Program
Unit 4: Interrupts

BLOCK 4 8051 MICROCONTROLLER

Unit 1: Architecture of 8051
Unit 2: Memory Organization of 8051
Unit 3: Special Purpose Registers
Unit 4: Addressing Modes

BLOCK 5 8051 PROGRAMMING AND APPLICATIONS

Unit 1: Instruction sets
Unit 2: I/O port Programming
Unit 3: Timer and Counter Programming
Unit 4: Serial Communication

Books:

1. Ramesh S Gaonkar, Microprocessor Architecture, Programming and application with 8085, 4th Edition, Penram International Publishing, New Delhi, 2000. (Unit I, II)
2. John Uffenbeck, The 80x86 Family, Design, Programming and Interfacing, Third Edition. Pearson Education, 2002.
3. Mohammed Ali Mazidi and Janice Gillispie Mazidi, The 8051 Microcontroller and Embedded Systems, Pearson Education Asia, New Delhi, 2003. (Unit IV, V)
4. A.K. Ray and K.M.Burchandi, Intel Microprocessors Architecture Programming and Interfacing, McGraw Hill International Edition, 2000
5. Kenneth J Ayala, The 8051 Microcontroller Architecture Programming and Application, 2nd Edition, Penram International Publishers (India), New Delhi, 1996.
6. M. Rafi Quazzaman, Microprocessors Theory and Applications: Intel and Motorola prentice Hall of India, Pvt. Ltd., New Delhi, 2003

SEMESTER : VI
Subject Code : EE6003
Subject Title : High Voltage Engineering

Structure of the Course Content

BLOCK 1 OVER VOLTAGES IN ELECTRICAL POWER SYSTEMS

Unit 1: Causes of over voltages and its effect on power system

Unit 2: Lightning, switching surges

Unit 3: temporary over voltages

Unit 4: protection against over voltages

BLOCK 2 ELECTRICAL BREAKDOWN IN GASES, SOLIDS AND LIQUIDS

Unit 1: Gaseous breakdown in uniform and non-uniform fields

Unit 2: corona discharges – Vacuum breakdown

Unit 3: conduction and breakdown in pure and commercial liquids

Unit 4: breakdown mechanisms in solid and composite dielectrics

BLOCK 3 GENERATION OF HIGH VOLTAGES AND HIGH CURRENTS

Unit 1: Generation of High DC impulse voltages and currents

Unit 2: Generation of High AC impulse voltages and currents

Unit 3: Tripping Mechanisms

Unit 4: Tripping and control of impulse generators

BLOCK 4 MEASUREMENT OF HIGH VOLTAGES AND HIGH CURRENTS

Unit 1: Measurement of High voltages

Unit 2: Measurement of High currents

Unit 3: digital techniques in high voltage measurement

Unit 4: digital techniques in high current measurement

BLOCK 5 HIGH VOLTAGE TESTING & INSULATION COORDINATION

Unit 1: High voltage testing of electrical power apparatus

Unit 2: power frequency, impulse voltage and DC testing

Unit 3: International and Indian standards

Unit 4: Insulation Coordination

Books:

1. M.S. Naidu and V. Kamaraju, 'High Voltage Engineering', Tata McGraw Hill, 3rd Edition, 2004
2. E. Kuffel and W.S. Zaengl, 'High Voltage Engineering Fundamentals', Pergamon press, Oxford, London, 1986.
3. E. Kuffel and M. Abdullah, 'High Voltage Engineering', Pergamon press, Oxford, 1970.
4. Allan Greenwood, 'Electrical Transients in Power Systems', Wiley Interscience, New York, 2nd edition 1991.
5. R.D. Begamudre, 'Extra High Voltage AC Transmission Engineering', Wiley Eastern Limited, 1986

SEMESTER : VI
Subject Code : EE6004
Subject Title : Protection and Switchgear

Structure of the Course Content

BLOCK 1 PROTECTIVE SCHEMES

- Unit 1: Principles and need for protective schemes
- Unit 2: types of faults – fault current calculation using symmetrical components
- Unit 3: Power system earthing
- Unit 4: Zones of protection and essential qualities of protection

BLOCK 2 RELAY

- Unit 1: Electromagnetic relays
- Unit 2: Over current, directional Relays
- Unit 3: distance and differential Relays
- Unit 4: under frequency relays – static relays

BLOCK 3 APPARATUS PROTECTION

- Unit 1: Apparatus protection transformer, generator, motor
- Unit 2: protection of bus bars
- Unit 3: protection of transmission lines
- Unit 4: CTs and PTs and their applications in protection schemes

BLOCK 4 THEORY OF CIRCUIT INTERRUPTION

- Unit 1: Physics of arc phenomena and arc interruption
- Unit 2: Restriking voltage & Recovery voltage, rate of rise of recovery voltage
- Unit 3: resistance switching, current chopping, interruption of capacitive current
- Unit 4: DC circuit breaking

BLOCK 5 CIRCUIT BREAKERS

- Unit 1: Air blast, Air break, oil SF6
- Unit 2: Vacuum circuit breakers
- Unit 3: comparative merits of different circuit breakers
- Unit 4: Testing of circuit breakers

Books:

1. B. Ravindranath, and N. Chander, 'Power System Protection & Switchgear', Wiley Eastern Ltd., 1977
2. Sunil S. Rao, 'Switchgear and Protection', Khanna publishers, New Delhi, 1986 .
3. C.L. Wadhwa, 'Electrical Power Systems', Newage International (P) Ltd., 2000.
4. M.L. Soni, P.V. Gupta, V.S. Bhatnagar, A. Chakrabarti, 'A Text Book on Power System Engineering', Dhanpat Rai & Co., 1998.
5. Badri Ram, Vishwakarma, 'Power System Protection and Switchgear', Tata McGraw hill, 2001.
6. Y.G. Paithankar and S.R. Bhide, 'Fundamentals of Power System Protection', Prentice Hall of India Pvt. Ltd., New Delhi – 110001, 2003.

SEMESTER : VI
Subject Code : EEP007
Subject Title : Microprocessor and Microcontrollers Lab
Structure of the Course Content

Practical

1. Programs for 8/16 bit Arithmetic operations (Using 8085).
2. Programs for Sorting and Searching (Using 8085, 8086).
3. Programs for String manipulation operations (Using 8086).
4. Programs for Digital clock and Stop watch (Using 8086).
5. Interfacing ADC and DAC.
6. Parallel Communication between two MP Kits using Mode 1 and Mode 2 of 8255.
7. Interfacing and Programming 8279, 8259, and 8253.
8. Serial Communication between two MP Kits using 8251.
9. Interfacing and Programming of Stepper Motor and DC Motor Speed control.
10. Programming using Arithmetic, Logical and Bit Manipulation instructions of 8051 microcontroller.
11. Programming and verifying Timer, Interrupts and UART operations in 8031 microcontroller.
12. Communication between 8051 Microcontroller kit and PC

SEMESTER : VI
Subject Code : EEP008
Subject Title : Communication Skills Lab
Structure of the Course Content

I. PC based session (weightage-40%)

A. English Language Lab

1. Listening Comprehension

Listening and typing – Listening and sequencing of sentences –
Filling in the blanks – Listening and answering the questions

2. Reading Comprehension and Vocabulary

Filling in the blanks - Cloze Exercises – Vocabulary building –
Reading and answering questions.

3. Speaking:

Phonetics: Intonation – Ear Training – Correct Pronunciation –
Sound recognition exercises -Common Errors in English

Conversations: Face to Face Conversation - Telephone conversation –
Role play activities (Students take on roles and engage in conversation)

B. Career Lab

(Samples are available to learn and practice in the class room session)

1. Resume / Report Preparation / Letter Writing

Structuring the resume / report – Letter writing / E-mail communication –
Samples

2. Presentation Skills

Elements of an effective presentation – Structure of a presentation –
Presentation tools – Voice Modulation – Audience analysis – Body
Language – Video Samples

3. Soft Skills

Time Management – Articulateness – Assertiveness – Psychometrics –
Innovation and Creativity – Stress Management & Poise – Video Samples

4. Group Discussion

Why is GD part of selection process? – Structure of a GD – Moderator-led and other GDs – Strategies in GD – Team work – Body Language – Mock GD – Video Samples

5. Interview Skills

Kinds of Interviews – Required Key Skills – Corporate culture – Mock Interviews – Video Samples

II. Class Room Session (weightage-60%)

1. Resume / Report Preparation /Letter writing : Students prepare their own resume and report.
2. Presentation Skills: Students make presentations on given topics.
3. Group Discussion: Students participate in group discussions.
4. Interview Skills: Students participate in Mock interviews.

SEMESTER : VII
Subject Code : EE7001
Subject Title : Principles and Management

Structure of the Course Content

BLOCK 1 OVERVIEW OF MANAGEMENT

- Unit 1: Definition - Management - Role of managers
- Unit 2: Evolution of Management thought
- Unit 3: Organization and the environmental factors
- Unit 4: Trends and Challenges of Management in Global Scenario

BLOCK 2 PLANNING

- Unit 1: Planning process - Types of plans
- Unit 2: Managing by objective (MBO) Strategies
- Unit 3: Policies
- Unit 4: Decision Making

BLOCK 3 ORGANIZING

- Unit 1: Organization structure
- Unit 2: Departmentation - Span of control - Centralization and Decentralization
- Unit 3: Staffing - Selection and Recruitment - Orientation
- Unit 4: Training - Performance Appraisal

BLOCK 4 DIRECTING

- Unit 1: Creativity and Innovation - Motivation and Satisfaction
- Unit 2: Leadership Styles - Leadership theories
- Unit 3: Communication
- Unit 4: Organization Culture

BLOCK 5 CONTROLLING

- Unit 1: Process of controlling - Types of control
- Unit 2: Budgetary and non-budgetary control techniques
- Unit 3: Managing Productivity - Cost Control
- Unit 4: Quality Control - Planning operations

Books:

1. Stephen P. Robbins and Mary Coulter, 'Management', Prentice Hall of India, 8th edition.
2. Charles W L Hill, Steven L McShane, 'Principles of Management', Mcgraw Hill Education, Special Indian Edition, 2007.
3. Hellriegel, Slocum & Jackson, ' Management - A Competency Based Approach', Thomson South Western, 10th edition, 2007.
4. Harold Koontz, Heinz Weihrich and Mark V Cannice, 'Management - A global & Entrepreneurial Perspective', Tata Mcgraw Hill, 12th edition, 2007.
5. Andrew J. Dubrin, 'Essentials of Management', Thomson Southwestern, 7th edition, 2007.

SEMESTER : VII
Subject Code : EE7002
Subject Title : Electrical Energy Generation and Utilization

Structure of the Course Content

BLOCK 1 POWER GENERATION

- Unit 1: thermal, hydro based power generation
- Unit 2: nuclear based power generation
- Unit 3: Non-conventional methods of power generation
- Unit 4: Effect of distributed generation on power system operation

BLOCK 2 ECONOMIC ASPECTS OF GENERATION

- Unit 1: Economic aspects of power generation – load and load duration curves
- Unit 2: cost of electrical energy – tariff
- Unit 3: Economics of power factor improvement –power capacitors – power quality.
- Unit 4: Introduction to energy auditing

BLOCK 3 ILLUMINATION

- Unit 1: Importance of lighting – properties of good lighting scheme
- Unit 2: laws of illumination –photometry - types of lamps
- Unit 3: basic design of illumination schemes
- Unit 4: energy efficiency lamps

BLOCK 4 INDUSTRIAL HEATING AND WELDING

- Unit 1: resistance heating – induction heating
- Unit 2: dielectric heating - electric arc furnaces
- Unit 3: electric welding – welding generator
- Unit 4: welding transformer and the characteristics.

BLOCK 5 ELECTRIC TRACTION

- Unit 1: Merits of electric traction – requirements of electric traction system
- Unit 2: supply systems –mechanics of train movement
- Unit 3: traction motors and control
- Unit 4: recent trends in electric traction.

Books:

1. C.L. Wadhwa, 'Generation, Distribution and Utilization of Electrical Energy', New Age International Pvt. Ltd, 2003.
2. B.R. Gupta, 'Generation of Electrical Energy', Eurasia Publishing House (P) Ltd, New Delhi, 2003
3. H. Partab, 'Art and Science of Utilisation of Electrical Energy', Dhanpat Rai and Co, New Delhi, 2004.
4. E. Openshaw Taylor, 'Utilization of Electrical Energy in SI Units', Orient Longman Pvt. Ltd, 2003.
5. J.B. Gupta, 'Utilization of Electric Power and Electric Traction', S.K.Kataria and Sons, 2002

SEMESTER : VII
Subject Code : EE7003
Subject Title : Power System Operation

Structure of the Course Content

BLOCK 1 INTRODUCTION TO POWER SYSTEM CONTROL

- Unit 1: System load variation: System load characteristics, load curves
- Unit 2: load-duration curve, load factor, diversity factor
- Unit 3: Reserve requirements
- Unit 4: Overview of system control

BLOCK 2 REAL POWER - FREQUENCY CONTROL

- Unit 1: Fundamentals of speed governing mechanism and modeling
- Unit 2: Load sharing
- Unit 3: Static and dynamic analysis
- Unit 4: Economic Dispatch Control

BLOCK 3 REACTIVE POWER–VOLTAGE CONTROL

- Unit 1: Typical excitation system, modeling, static and dynamic analysis
- Unit 2: Relation between voltage, power and reactive power at a node
- Unit 3: method of voltage control: Injection of reactive power
- Unit 4: Tap-changing transformer, numerical problems

BLOCK 4 UNIT COMMITMENT AND ECONOMIC DISPATCH

- Unit 1: Statement of Unit Commitment (UC) problem; constraints in UC
- Unit 2: UC solution methods: Priority-list methods
- Unit 3: Incremental cost curve, co-ordination equations without loss and with loss
- Unit 4: Economic dispatch controller added to LFC control

BLOCK 5 COMPUTER CONTROL OF POWER SYSTEMS

- Unit 1: Energy control centre: Functions
- Unit 2: SCADA and EMS functions
- Unit 3: Various operating states
- Unit 4: State transition diagram and control strategies

Books:

1. Olle. I. Elgerd, 'Electric Energy Systems Theory – An Introduction', Tata McGraw Hill Publishing Company Ltd, New Delhi, Second Edition, 2003.
2. Allen.J.Wood and Bruce F.Wollenberg, 'Power Generation, Operation and Control', John Wiley & Sons, Inc., 2003.
3. P. Kundur, 'Power System Stability & Control', McGraw Hill Publications, USA, 1994
4. D.P. Kothari and I.J. Nagrath, 'Modern Power System Analysis', Third Edition, Tata McGraw Hill Publishing Company Limited, New Delhi, 2003.
5. L.L. Grigsby, 'The Electric Power Engineering, Hand Book', CRC Press & IEEE Press,

SEMESTER : VII
Subject Code : EEP009
Subject Title : Technical Seminar
Structure of the Course Content

OBJECTIVE

During the seminar session each student is expected to prepare and present a topic on engineering/ technology, for a duration of about 8 to 10 minutes. In a session of three periods per week, 15 students are expected to present the seminar. A faculty guide is to be allotted and he / she will guide and monitor the progress of the student and maintain attendance also. Students are encouraged to use various teaching aids such as over head projectors, power point presentation and demonstrative models. This will enable them to gain confidence in facing the placement interviews

SEMESTER : VII
Subject Code : EEP010
Subject Title : Power System Lab
Structure of the Course Content

1. Computation of Parameters and Modelling of Transmission Lines
2. Formation of Bus Admittance and Impedance Matrices and Solution of Networks.
3. Load Flow Analysis - I : Solution of Load Flow And Related Problems Using Gauss-Seidel Method
4. Load Flow Analysis - II: Solution of Load Flow and Related Problems Using Newton-Raphson and Fast-Decoupled Methods
5. Fault Analysis
6. Transient and Small Signal Stability Analysis: Single-Machine Infinite Bus System
7. Transient Stability Analysis of Multimachine Power Systems
8. Electromagnetic Transients in Power Systems
9. Load – Frequency Dynamics of Single- Area and Two-Area Power Systems
10. Economic Dispatch in Power Systems

SEMESTER : VIII
Subject Code : EE8001
Subject Title : Power Electronics

Structure of the Course Content

BLOCK 1 POWER SEMI-CONDUCTOR DEVICES

- Unit 1: Structure, operation and characteristics of SCR, TRIAC
- Unit 2: Structure, operation and characteristics of MOSFET and IGBT
- Unit 3: Driver and snubber circuits for MOSFET
- Unit 4: Turn-on and turn-off characteristics and switching losses

BLOCK 2 PHASE-CONTROLLED CONVERTERS

- Unit 1: 2-pulse, 3-pulse and 6-pulse converters
- Unit 2: Inverter operation of fully controlled converter
- Unit 3: Effect of source inductance
- Unit 4: Single phase AC voltage controllers

BLOCK 3 DC TO DC CONVERTERS

- Unit 1: Step-down and step-up choppers
- Unit 2: Time ratio control and current limit control
- Unit 3: Switching mode regulators: Buck, boost, buck-boost and cuk converter
- Unit 4: Resonant switching based SMPS

BLOCK 4 INVERTERS

- Unit 1: Single phase and three phase (both 1200 mode and 1800 mode) inverters
- Unit 2: PWM techniques: Sinusoidal PWM
- Unit 3: Voltage and harmonic control
- Unit 4: Series resonant inverter - Current source inverters

BLOCK 5 APPLICATIONS OF POWER ELECTRONICS

- Unit 1: Uninterrupted power supply topologies
- Unit 2: Flexible AC transmission systems
- Unit 3: Shunt and series static VAR compensator
- Unit 4: Unified power flow controller- HVDC Transmission

Books:

1. Muhammad H. Rashid, 'Power Electronics: Circuits, Devices and Applications', Pearson Education, Third edition, 2004 / PHI.
2. Ned Mohan, Tore.M.Undeland, William.P.Robbins, 'Power Electronics: Converters, Applications and Design', John Wiley and sons, third edition, 2003
3. Cyril.W.Lander, 'Power Electronics', McGraw Hill International, Third edition, 1993.
4. Bimal K. Bose, 'Modern Power Electronics and AC Drives', Pearson Education, 2003.
5. Mr. Jaganathan, 'Introduction to Power Electronics', Prentice Hall of India, 2004

SEMESTER : VIII
Subject Code : EEP011
Subject Title : Power Electronics Lab
Structure of the Course Content

1. Characteristics of SCR
2. Characteristics of TRIAC
3. Characteristics of MOSFET and IGBT
4. Transient characteristics of SCR and MOSFET
5. AC to DC fully controlled converter
6. AC to DC half-controlled converter
7. Step down and step up MOSFET based choppers
8. IGBT based single-phase PWM inverter
9. IGBT based three-phase PWM inverter
10. Resonant dc-to-dc converter

SEMESTER : VIII
Subject Code : EEP012
Subject Title : Project
Structure of the Course Content

Practical

The objective of the project work is to enable the students to work in convenient groups of not more than four members in a group on a project involving theoretical and experimental studies related to Electrical Engineering. Every Project Work shall have a Guide who is a member of the faculty of Electrical Engineering of the college where the student is registered. The hours allotted for this course shall be utilized by the students to receive directions from the Guide, on library reading, laboratory work, computer analysis or field work and also to present in periodical seminars the progress made in the project.

Each student shall finally produce a comprehensive report covering background information, literature Survey, problem statement, Project work details and conclusions. This experience of project work shall help the student in expanding his / her knowledge base and also provide opportunity to utilise the creative ability and inference capability.

ELECTIVE

Subject Code : ETE001

Subject Title : Digital Signal Processing

Structure of the Course Content

BLOCK 1 PARAMETRIC METHODS FOR POWER SPECTRUM ESTIMATION

Unit 1: Relationship between the auto correlation and the model parameters

Unit 2: Yule and Walker method for the AR Model Parameters

Unit 3: Burg Method for the AR Model parameters

Unit 4: Sequential estimation methods for the AR Model parameters

BLOCK 2 ADAPTIVE SIGNAL PROCESSING

Unit 1: FIR adaptive filters – steepest descent adaptive filter

Unit 2: LMS algorithm

Unit 3: Noise cancellation – channel equalization

Unit 4: Adaptive recursive filters – recursive least squares

BLOCK 3 MULTIRATE SIGNAL PROCESSING

Unit 1: Decimation by a factor D – Interpolation by a factor I

Unit 2: Filter Design and implementation for sampling rate conversion

Unit 3: Direct form FIR filter structures

Unit 4: Poly phase filter structure

BLOCK 4 SPEECH SIGNAL PROCESSING

Unit 1: Digital models for speech signal

Unit 2: Mechanism of speech production

Unit 3: Time domain processing of speech signal

Unit 4: Linear predictive Coding

BLOCK 5 WAVELET TRANSFORMS

Unit 1: Fourier Transform

Unit 2: Discrete Time Fourier Transform

Unit 3: Continuous Wavelet Transform

Unit 4: Perfect Reconstruction Filter Banks and wavelets

Books:

1. John G.Proakis, Dimitris G.Manobakis, Digital Signal Processing, Principles, Algorithms and Applications, Third edition, (2000) PHI.
2. Monson H.Hayes – Statistical Digital Signal Processing and Modeling, Wiley, 2002.
3. L.R.Rabiner and R.W.Schaber, Digital Processing of Speech Signals, Pearson Education (1979).
4. Roberto Crist, Modern Digital Signal Processing, Thomson Brooks/Cole (2004)
5. Raghuveer. M. Rao, Ajit S.Bopardikar, Wavelet Transforms, Introduction to Theory and applications, Pearson Education, Asia, 2000.

ELECTIVE

Subject Code : ETE002

Subject Title : Operating Systems

Structure of the Course Content

BLOCK 1 OVERVIEW OF OPERATING SYSTEMS AND PROCESSES

Unit 1: Introduction

Unit 2: Types of OS

Unit 3: Process

Unit 4: Process Scheduling

BLOCK 2 INTERPROCESS COMMUNICATIONS & SYNCHRONIZATION

Unit 1: Introduction

Unit 2: Inter process Communication

Unit 3: Semaphores

Unit 4: Deadlocks

BLOCK 3 MEMORY MANAGEMENT

Unit 1: Introduction

Unit 2: Paging

Unit 3: Segmentation

Unit 4: Virtual Memory

BLOCK 4 I/O AND FILE MANAGEMENT

Unit 1: I/O Management

Unit 2: File Management

Unit 3: Secondary Storage Management

Unit 4: Disk Scheduling

BLOCK 5 LINUX PROGRAMMING AND ADMINISTRATION

Unit 1: Introduction

Unit 2: Linux Commands and Utilities

Unit 3: Shell Scripts

Unit 4: System Administration

Books :

1. Operating System by William Stallings, Prentice Hall of India, 4th Edition, 2003.
2. Operating System Concepts by Abraham Silberschatz, and James L. Addison Wesley Publishing Company
3. Operating Systems – A Concept Based Approach by D.M. Dhamdhare, TMGH
4. Operating Systems , Concepts and Design by Milan Milenkovic, TMGH, 2000
5. Linux - The Complete Reference by Richard Peterson, Tata McGraw Hill, New Delhi
6. Operating Systems – Design and Implementation by Andrew S. Tanenbaum, Prentice Hall of India, New Delhi
7. Introduction to Operating Systems by Harvey M. Deital, Addison Wesley Publishing Company
8. Operating Systems and Software Diagnostics by Ramesh Bangia, Balvir Singh, Lakshmi Publications (Pvt) Ltd, New Delhi
9. Operating Systems Concepts by P.S.Gill, Lakshmi Publications (Pvt) Ltd, New Delhi
10. Operating Systems Fundamentals by D.Irtegov, Lakshmi Publications (Pvt) Ltd, New Delhi

ELECTIVE

Subject Code : ETE003

Subject Title : Computer Networks

Structure of the Course Content

BLOCK 1 Network Fundamentals

Unit 1: Data Communication Networking

Unit 2: Overview of OSI

Unit 3: IP Addressing

Unit 4: Routing

BLOCK 2 Data Communications

Unit 1: Data Encoding

Unit 2: Flow and Error Control

Unit 3: Routers, Switches and Bridges

Unit 4: Congestion Control

BLOCK 3 Wireless LAN

Unit 1: Fundamentals of WLANs

Unit 2: IEEE 802.11 Standards

Unit 3: WLL

Unit 4: IEEE 802.16 Standards

BLOCK 4 Routing Protocols

Unit 1: MAC Protocols

Unit 2: Hybrid Routing Protocols

Unit 3: Multicast Routing Protocols

Unit 4: Tree-based and Mesh-based Protocols

BLOCK 5 Transport Layer

Unit 1: Transport layer Protocol

Unit 2: TCP over Adhoc wireless Networks

Unit 3: Network security attacks

Unit 4: Security routing

Books:

1. Mohammad Ilyas, The Handbook of AdHoc Wireless Networks, CRC press
2. Douglas E. Comer, "Internetworking with TCP/IP, Vol. 1", Third Edition, Prentice Hall
3. Behrouza A Forouzan, "Data Communications and Networking" Fourth edition, TMH
4. Wayne Tomasi, "Introduction to Data communications and Networking" Pearson Education
5. Al Williams, "Embedded Internet Design", Second Edition, TMH
6. Cory L. Clark, "LabVIEW Digital Signal Processing and Digital Communication", TMH edition
7. Krishna Kant, "Computer based Industrial control", PHI
8. Gary Johnson, "LabVIEW Graphical Programming", Second edition, McGraw Hill, Newyork
9. Kevin James, "PC Interfacing and Data Acquisition: Techniques for measurement, Instrumentation and control, Newnes

ELECTIVE

Subject Code : ETE004

Subject Title : Flexible AC Transmission System

Structure of the Course Content

BLOCK 1 Transmission lines

Unit 1: Reactive Power Control

Unit 2: Uncompensated Transmission Line

Unit 3: Basic Concepts of Static Var Compensator

Unit 4: Thyristor Switched Series Capacitor

BLOCK 2 Static Var Compensator

Unit 1: Voltage Control by SVC

Unit 2: Design of SVC Voltage Regulator

Unit 3: Modelling of SVC for Power Flow and Transient Stability

Unit 4: Prevention of Voltage Instability

BLOCK 3 Thyristor Controlled Series Capacitor

Unit 1: Operation of the TCSC

Unit 2: Different Modes of Operation

Unit 3: Modelling of TCSC – Variable Reactance Model

Unit 4: Modelling for Power Flow and Stability Studies

BLOCK 4 FACT Controllers

Unit 1: Static Synchronous Compensator

Unit 2: Steady State Power Transfer

Unit 3: Operation of SSSC and the Control of Power Flow

Unit 4: Modelling of SSSC in Load Flow and Transient Stability Studies

BLOCK 5 Co-ordinations of FACTS Controllers

Unit 1: Controller Interactions

Unit 2: SVC Interaction

Unit 3: Co-Ordination of Multiple Controllers

Unit 4: Control Coordination using Genetic Algorithms

Books:

1.K.R.Padiyar,” FACTS Controllers in Power Transmission and Distribution”, New Age International(P) Limited, Publishers, New Delhi

2.Narain G. Hingorani, “Understanding FACTS -Concepts and Technology of Flexible AC Transmission Systems”, Standard Publishers Distributors, Delhi

3. A.T.John, “Flexible A.C. Transmission Systems”, Institution of Electrical and Electronic Engineers (IEEE)

4. R.Mohan Mathur, Rajiv K.Varma, “Thyristor – Based Facts Controllers for Electrical Transmission Systems”, IEEE press and John Wiley & Sons, Inc

5. V.K.Sood,HVDC and FACTS controllers – Applications of Static Converters in Power System, APRIL 2004 , Kluwer Academic Publishers

ELECTIVE

Subject Code : ETE005

Subject Title : Transducers and Measurements

Structure of the Course Content

BLOCK 1 R, L, and C Elements

- Unit 1: Strain gauge and Electrode Elements
- Unit 2: Inductive and Capacitive Elements
- Unit 3: Equivalent Circuits and Characteristics
- Unit 4: Proximity Elements

BLOCK 2 Transformer and Resonant Elements

- Unit 1: Transformer Elements
- Unit 2: Electrodynamics Elements
- Unit 3: Vibrating Strings and Vibrating Beams
- Unit 4: Piezoelectric Resonators and Acoustical Resonators

BLOCK 3 Mechanical and Acoustical Elements

- Unit 1: Stresses State of Diaphragm
- Unit 2: Inertial Mass Elements
- Unit 3: Acoustical elements
- Unit 4: Ultrasonic Elements

BLOCK 4 Optical Sensors

- Unit 1: Photo Detectors and Thermal Detectors
- Unit 2: Photo Diodes and Avalanche Photo Diodes
- Unit 3: Fiber Optic Sensors
- Unit 4: Fiber Optic Gyroscopes and other Fiber Sensors

BLOCK 5 Magnetic and Electronic Sensors

- Unit 1: Hall Effect Sensors
- Unit 2: Solid State Chemical Sensors
- Unit 3: Silicon Based Sensors
- Unit 4: Magneto resistors and other Sensors

Books:

1. Pavel Ripka and Alois Tipek, "Modern sensors hand book", Instrumentation and measurement series, ISTE Ltd
2. David Fraden. , PHI, 2004 " Hand book of Modern Sensors, Physics, Design and Applications", Third Edition, Springer India Pvt.Ltd
3. Alexander D Khazan, "Transducers and their elements – Design and application", PTR Prentice Hall

ELECTIVE

Subject Code : ETE006

Subject Title : Soft Computing

Structure of the Course Content

BLOCK 1 Introduction to Soft Computing

Unit 1: Approaches to Intelligent Control

Unit 2: Architecture for Intelligent Control

Unit 3: Symbolic Reasoning System and Rule Based Systems

Unit 4: Expert Systems

BLOCK 2 Neural Networks

Unit 1: Concept of Artificial Neural Networks

Unit 2: Learning and Training the Neural Network

Unit 3: Hopfield Network and Self-Organizing Network

Unit 4: Neural Network Based Controller

BLOCK 3 Fuzzy Logic Systems

Unit 1: Introduction to Crisp Sets and Fuzzy Sets

Unit 2: Fuzzy Set Operation and Approximate Reasoning

Unit 3: Fuzzy Knowledge and Rule Bases

Unit 4: Fuzzy Modelling and Control Schemes

BLOCK 4 Genetic Algorithms

Unit 1: Basic Concept of Genetic Algorithm

Unit 2: Solution of Typical Control Problems

Unit 3: Concept on Search Techniques

Unit 4: Techniques for Solving Optimization Problems.

BLOCK 5 Case Studies

Unit 1: GA Application to Power System Optimisation Problem

Unit 2: Identification and Control of Linear Dynamic Systems using Mat Lab

Unit 3: Stability Analysis of Neural-Network Interconnection Systems

Unit 4: Stability Analysis of Fuzzy Control Systems

Books:

- 1.KOSKO,B. "Neural Networks And Fuzzy Systems", Prentice-Hall of India Pvt. Ltd
2. Jacek.M.Zurada, "Introduction to Artificial Neural Systems", Jaico Publishing House
- 3.Driankov, Hellendroon, "Introduction to Fuzzy Control", Narosa Publishers
- 4.KLIR G.J. & FOLGER T.A. "Fuzzy sets, uncertainty and Information", Prentice-Hall of India Pvt. Ltd
- 5.Zimmerman H.J. "Fuzzy set theory-and its Applications"-Kluwer Academic Publishers

ELECTIVE

Subject Code : ETE007

Subject Title : Principles of Robotics

Structure of the Course Content

BLOCK 1 Fundamentals of Robotics

Unit 1: History of Robotics

Unit 2: Classification of Robotics

Unit 3: Robots Components

Unit 4: Sensors and Actuators

BLOCK 2 Kinematics

Unit 1: Basic Mechanisms

Unit 2: Matrix Representation

Unit 3: Inverse Kinematics

Unit 4: Solution and Programming

BLOCK 3 Differential Motion and Velocities

Unit 1: Differential Motion of Frames

Unit 2: Interpretation and Calculation of Jacobian

Unit 3: Design and Lagrangian Mechanics

Unit 4: Dynamic Equations

BLOCK 4 Control Systems in Robots

Unit 1: Hydraulic Control

Unit 2: Pneumatic Control

Unit 3: Sensor and Electric Actuator

Unit 4: PID Control

BLOCK 5 Vision Systems in Robotics

Unit 1: Two and Three Dimensional Images

Unit 2: Spatial and Frequency Domain Representation

Unit 3: Processing Techniques

Unit 4: Image Analysis and Object Recognition

Books:

1. R.D. Klafter, TA Chmielewski and Michael Negin, "Robotic Engineering, An Integrated approach", Prentice Hall of India
2. Saeed B. Niku, "Introduction to Robotics ", Pearson Education
3. Fu, Gonzalez and Lee Mcgrahill, "Robotics ", international

ELECTIVE

Subject Code : ETE008

Subject Title : Special Electrical Machines

Structure of the Course Content

BLOCK 1 Stepper Motor

Unit 1: Constructional Features and Principle of Operation

Unit 2: Modes of Excitation

Unit 3: Dynamic Characteristics

Unit 4: Closed Loop Control of Stepping Motor

BLOCK 2 Switched Reluctance Motor

Unit 1: Constructional Features and Principle of Operation

Unit 2: Torque Equation of Switched Reluctance Motor

Unit 3: Characteristics of Switched Reluctance Motor

Unit 4: Control of Switched Reluctance Motor

BLOCK 3 Synchronous Reluctance Motors

Unit 1: Constructional Features and Principle of Operation

Unit 2: Axial and Radial Air Gap Motors

Unit 3: Reluctance Torque and Phasor Diagram

Unit 4: Characteristics of Synchronous Reluctance Motor

BLOCK 4 Permanent Magnet Synchronous Motor

Unit 1: Constructional Features and Principle of Operation

Unit 2: Speed Torque Characteristics

Unit 3: Phasor Diagram

Unit 4: Control of Permanent Magnet Synchronous Motor

BLOCK 5 Permanent Magnet Brushless DC Motor

Unit 1: Commutation in DC motors

Unit 2: Multiphase Brushless Motor

Unit 3: Square Wave Permanent Magnet Brushless Motor Drives

Unit 4: Torque Speed Characteristics

Books:

1. Miller, T.J.E. "Brushless permanent magnet and reluctance motor drives", Clarendon Press, Oxford
2. Kenjo, T, "Stepping motors and their microprocessor control", Clarendon Press, Oxford
3. R.Krishnan, "Switched Reluctance Motors Drives: Modelling, Simulation, Analysis Design and Applications", CRC Press, New York

ELECTIVE

Subject Code : ETE009

Subject Title : Embedded Systems

Structure of the Course Content

BLOCK 1 Embedded Hardware and Software

Unit 1: Memory

Unit 2: Direct Memory Access

Unit 3: Interrupt Latency

Unit 4: Shared Data Problems

BLOCK 2 Hardware and Software Partitioning

Unit 1: Hardware/Software Co-Design

Unit 2: Single-Processor Architectures &, Multi-Processor Architectures

Unit 3: Models of Computation

Unit 4: Embedded System Specification

BLOCK 3 Hardware and Software Co-Synthesis

Unit 1: The Co-Synthesis Problem

Unit 2: State-Transition Graph

Unit 3: Refinement and Controller Generation

Unit 4: Distributed System Co-Synthesis

BLOCK 4 Memory Interfacing

Unit 1: Memory Writes ability and Storage Performance

Unit 2: Advance RAM Interfacing Communication Basic

Unit 3: Arbitration Multilevel Bus Architecture

Unit 4: Serial Protocol and Parallel Protocols

BLOCK 5 Concurrent Process Models

Unit 1: Finite State Machines

Unit 2: HCFSL and State Charts

Unit 3: State Machine Models

Unit 4: Hardware Software Co-Simulation

Books:

1. Frank Vahid and Tony Gwargie, "Embedded System Design", John Wiley & sons
2. Raj Kamal, "Embedded Systems- Architecture, Programming and Design"
3. David. E. Simon, "An Embedded Software Primer", Pearson Education
4. Tammy Noergaard, "Embedded System Architecture, A comprehensive Guide for Engineers and Programmers", Elsevier
5. Steve Heath, "Embedded System Design", Elsevier, Second Edition
6. Ralf Niemann, "Hardware/Software Co-Design for Data Flow Dominated Embedded Systems", Kluwer Academic Pub
7. Jorgen Staunstrup, Wayne Wolf, "Harware/Software Co-Design:Principles and Practice", Kluwer Academic Pub
8. Giovanni De Micheli, Rolf Ernst Morgon, "Reading in Hardware/Software Co-Design" Kaufmann Publishers

ELECTIVE

Subject Code : ETE010

Subject Title : Total Quality Management

Structure of the Course Content

BLOCK 1 Introduction to TQM

- Unit 1: Need for TQM, evolution of quality
- Unit 2: Definition of quality, TQM philosophy
- Unit 3: CONTRIBUTIONS OF Deming Juran
- Unit 4: Crosby and Ishikawa, TQM models

BLOCK 2 Planning

- Unit 1: Vision, Mission, Quality policy and objective Planning for quality
- Unit 2: Quality policy Deployment
- Unit 3: Quality function deployment
- Unit 4: Introduction to BPR and analysis of Quality Costs.

BLOCK 3 TQM Principles

- Unit 1: Customer focus, Leadership and Top management commitment
- Unit 2: Employee involvement – Empowerment and Team work
- Unit 3: Supplier Quality Management, Continuous process improvement
- Unit 4: Training, performance Measurement and customer satisfaction

BLOCK 4 TQM Tools and Techniques

- Unit 1: PDCA, the Seven Tools of Quality
- Unit 2: New Seven management tools
- Unit 3: Concept of six sigma, FMEA, Bench Marking
- Unit 4: JIT, POKA YOKE, 5S, KAIZEN, Quality circles

BLOCK 5 Quality Systems

- Unit 1: Need for ISO 9000 Systems
- Unit 2: Clauses Documentation, Implementation
- Unit 3: Introduction to ISO14000 and OSHAS18000
- Unit 4: Implementation of TQM, Case Studies

Books:

1. Dale H. Besterfield, “Total Quality Management”, Pearson Education Asia, (Indian reprint)
2. Oakland.J.S. “Total Quality Management”, Butterworth–Heinemann Ltd., Oxford
1. Brain Rethery, ISO 9000, Productivity and Quality Publishing Pvt. Ltd
3. Narayana V. and Sreenivasan, N.S., “Quality Management – Concepts and Tasks”, New Age International
4. Zeiri. “Total Quality Management for Engineers”, Wood Head Publishers
5. Juran J.M and Frank M. Gryna Jr., “Quality Planning and Analysis”, TMH, India
6. D.Mills, Quality Auditing, Chapman and Hall

ELECTIVE

Subject Code : ETE011

Subject Title : VLSI Design

Structure of the Course Content

BLOCK 1 CMOS Design

Unit 1: Overview of Digital VLSI Design Methodologies

Unit 2: Logic Design with CMOS

Unit 3: Dynamic CMOS Circuits and Bi-CMOS Circuits

Unit 4: Layout Diagram and Stick Diagram

BLOCK 2 Programmable Logic Devices

Unit 1: Programming Techniques

Unit 2: SRAM and EPROM and EEPROM Technology

Unit 3: Function Blocks, I/O Blocks, Interconnects

Unit 4: Xilinx and Altera MAX 7000

BLOCK 3 ASIC

Unit 1: System Partition

Unit 2: FPGA Partitioning

Unit 3: Partitioning Methods

Unit 4: Physical Design Flow

BLOCK 4 Analog VLSI Design

Unit 1: Introduction to Analog VLSI

Unit 2: Design of CMOS 2stage and 3 stage Op-Amp

Unit 3: Super MOS-Analog Primitive Cells

Unit 4: Realization of Neural Networks

BLOCK 5 Logic Syntheses and Simulation

Unit 1: Overview of Digital Design with Verilog HDL

Unit 2: Gate Level Modelling

Unit 3: Data Flow Modelling

Unit 4: Design Examples of Ripple carry Adders, Multiplier and ALU

Books:

- 1.M.J.S Smith, "Application Specific integrated circuits", Addison Wesley Longman Inc
- 2.Wayne Wolf, "Modern VLSI design " Prentice Hall India
- 3.Samir Palnitkar, "Veri Log HDL, A Design guide to Digital and Synthesis" 2nd Ed, Pearson
4. Kamran Eshraghian,Douglas A.pucknell and Sholeh Eshraghian,"Essentials of VLSI circuits and system", Prentice Hall India
- 5.Mohamed Ismail ,Terri Fiez, "Analog VLSI Signal and information Processing", McGraw Hill International Editions

ELECTIVE

Subject Code : ETE012

Subject Title : Real Time Systems

Structure of the Course Content

BLOCK 1 Introduction to Real Time Systems

Unit 1: Issues in Real Time Computing

Unit 2: Structure of a Real Time System

Unit 3: Performance Measures for Real Time Systems

Unit 4: Task Assignment and Scheduling

BLOCK 2 Programming Languages and Tools

Unit 1: Desired language characteristics

Unit 2: Data typing and Control structures

Unit 3: Facilitating Hierarchical Decomposition and Packages

Unit 4: Low level programming and Task Scheduling

BLOCK 3 Real Time Databases

Unit 1: Real time Vs General Purpose Databases

Unit 2: Main Memory Databases

Unit 3: Concurrency Control Issues

Unit 4: Disk Scheduling Algorithms

BLOCK 4 Communications

Unit 1: Real Time Communication media, Network Topologies Protocols

Unit 2: Fault Tolerance Techniques

Unit 3: Fault Types and Fault Detection

Unit 4: Fault Error Containment Redundancy

BLOCK 5 Evaluation Techniques

Unit 1: Reliability Evaluation Techniques

Unit 2: Reliability Models for Hardware Redundancy

Unit 3: Software Error Models

Unit 4: Fault Tolerant Synchronization in Software

Books:

- 1.C.M. Krishna, Kang G. Shin, "Real – Time Systems", McGraw – Hill International Editions
2. Stuart Bennett, "Real Time Computer Control – An Introduction", Prentice Hall of India
3. Rajib Mall, "Real-time systems: theory and practice", Pearson Education
4. Peter D.Lawrence, "Real Time Micro Computer System Design – An Introduction", McGraw Hill
5. S.T. Allworth and R.N.Zobel, "Introduction to real time software design", Macmillan, 2nd Edition
6. R.J.A Buhur, D.L Bailey, "An Introduction to Real – Time Systems", Prentice – Hall International
7. Philip.A.Laplante, "Real Time System Design and Analysis", Prentice Hall of India, 3rd Edition

ELECTIVE

Subject Code : ETE013

Subject Title : CAD of Power Electronic Circuits

Structure of the Course Content

BLOCK 1 Introduction to CAD in Power Electronic Circuits

Unit 1: Importance of Simulation

Unit 2: General Purpose Circuit Analysis

Unit 3: Methods of Analysis of Power Electronic Systems

Unit 4: Review of Power Electronic Devices and Circuits

BLOCK 2 Simulation Techniques

Unit 1: Analysis of Power Electronic Systems in a Sequential Manner

Unit 2: Coupled and Decoupled Systems

Unit 3: Various Algorithms for Computing Steady State Solutions

Unit 4: Future Trends in Computer Simulation

BLOCK 3 Modelling of Power Electronic Devices

Unit 1: AC Sweep and DC Sweep Analysis

Unit 2: Transients and the Time Domain Analysis

Unit 3: BJT, FET, MOSFET and its Model

Unit 4: Amplifiers and Oscillator

BLOCK 4 Simulations of Circuits

Unit 1: Schematic Capture and Libraries

Unit 2: Time Domain Analysis

Unit 3: System Level Integration and Analysis

Unit 4: Fourier analysis

BLOCK 5 Case Studies

Unit 1: Simulation of Converters feeding R and R-L Loads

Unit 2: Simulation of Choppers feeding R and R-L Loads

Unit 3: Simulation of Inverters feeding R and R-L Loads

Unit 4: Simulation of AC voltage controllers feeding R and R-L Loads

Books:

1. Rashid, M., Simulation of Power Electronic Circuits using pSPICE, PHI
2. Rajagopalan, V. "Computer Aided Analysis of Power Electronic systems"-Marcell – Dekker Inc
3. John Keown "Microsim, Pspice and circuit analysis"-Prentice Hall Inc

ELECTIVE

Subject Code : ETE014

Subject Title : MEMS

Structure of the Course Content

BLOCK 1 Micro Fabrication

Unit 1: Overview of Micro Fabrication

Unit 2: Silicon and other Material Based Fabrication Processes

Unit 3: Crystal Planes and Orientation

Unit 4: Torsional Deflections and Intrinsic Stress

BLOCK 2 Electrostatic Sensors and Actuation

Unit 1: Principle of Electrostatic Sensor

Unit 2: Design, Fabrication of Parallel Plate Capacitors as Electrostatic Sensors

Unit 3: Design and Fabrication of Parallel Plate Capacitors as Actuators

Unit 4: Applications of Electrostatic Sensor

BLOCK 3 Thermal Sensing and Actuation

Unit 1: Principle of Thermal Sensing Actuation

Unit 2: Design and Fabrication of Thermal Couples

Unit 3: Design and Fabrication of Thermal bimorph sensors

Unit 4: Design and Fabrication of Thermal resistor sensors

BLOCK 4 Piezoelectric Sensing Actuation

Unit 1: Piezoelectric effect

Unit 2: Cantilever Piezoelectric Actuator Model

Unit 3: Properties of Piezoelectric Materials

Unit 4: Applications of Piezoelectric Sensors

BLOCK 5 Case Studies in MEMS

Unit 1: Piezoresistive Sensors

Unit 2: Fluidics Applications

Unit 3: Medical Applications

Unit 4: Optical MEMS

Books:

1. Chang Liu, "Foundations of MEMS", Pearson International Edition
2. Marc Madou, "Fundamentals of microfabrication", CRC Press
3. Boston, "Micromachined Transducers Sourcebook", WCB McGraw Hill
4. M.H. Bao "Micromechanical transducers :Pressure sensors, accelerometers and gyroscopes", Elsevier, Newyork

ELECTIVE

Subject Code : ETE015

Subject Title : Advanced Control Systems

Structure of the Course Content

BLOCK 1 State variable Representation

Unit 1: State Equation for Dynamic Systems

Unit 2: Time Invariance and linearity

Unit 3: State Diagrams

Unit 4: Physical System and State Assignment

BLOCK 2 Solution of State Equation

Unit 1: Existence and Uniqueness of Solutions to Continuous

Unit 2: Time State Equations

Unit 3: Solution of Nonlinear and Linear Time Varying State Equations

Unit 4: System Modes

BLOCK3 Controllability

Unit 1: Controllability and Observability

Unit 2: Stabilizability and Delectability

Unit 3: Time Varying and Time Invariant Case

Unit 4: System Realizations

BLOCK 4 Stability

Unit 1: Stability in the Sense of Lyapunov

Unit 2: BIBO Stability

Unit 3: Stability of LTI Systems

Unit 4: Time Autonomous Systems

BLOCK 5 Modal Controls

Unit 1: Controllable and Observable Companion Forms

Unit 2: SISO and MIMO Systems

Unit 3: The Effect of State Feedback on Controllability

Unit 4: Full Order and Reduced Order Observers

Books:

1. M. Gopal, "Modern Control System Theory", New Age International
2. K. Ogatta, "Modern Control Engineering", PHI
3. D. Roy Choudhury, "Modern Control Systems", New Age International
4. John S. Bay, "Fundamentals of Linear State Space Systems", McGraw-Hill
5. John J. D'Azzo, C. H. Houpis and S. N. Sheldon, "Linear Control System Analysis and Design with MATLAB", Taylor Francis
6. Z. Bubnicki, "Modern Control Theory", Springer