

**Bharath Postgraduate College
In collaboration with**



**KARANATAKA STATE OPEN UNIVERSITY
Manasagangotri, Mysore – 570006**

**B.TECH IN ELECTRONICS AND
TELECOMMUNICATION ENGINEERING**

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- I	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 Application Lab-II	100	2
BE2007	Engineering Practices Laboratory	100	2

**ELECTRONICS AND TELECOMMUNICATION
ENGINEERING
III SEMESTER**

Subject Code	Subject Title	Max marks	Max Credits
ET 3001	Mathematics – III	100	2
ET 3002	Electrical Machines	100	3
ET 3003	Data Structures	100	3
ET 3004	Digital Electronics	100	3
ET 3005	Electronic Circuits- I	100	3
ETP 001	Data Structures Lab	100	2
ETP 002	Electronic Devices and Circuits Lab I	100	2

IV SEMESTER

Subject Code	Subject Title	Max marks	Max Credits
ET 4001	Random Processes	6100	3
ET 4002	Electronics Circuits- II	100	3
ET 4003	Electromagnetic Fields	100	3
ET 4004	Measurements and Instrumentation	100	3
ET 4005	Linear Integrated Circuits	100	3
ETP 003	Linear Integrated Circuits Lab	100	2
ETP 004	Digital Electronics Lab	100	2

V SEMESTER

Subject Code	Subject Title	Max marks	Max Credits
ET 5001	Digital Communication Engineering	100	3
ET 5002	Microprocessors and Microcontrollers	100	3
ET 5003	CONTROL SYSTEMS	100	3
ET 5004	Transmission Lines and Wave guides	100	3
ET5005	Satellite Communication	100	3
ETP 005	Communication Systems Lab	100	2
ETP 006	Microprocessor and Microcontroller Lab	100	2

VI SEMESTER

Subject Code	Subject Title	Max marks	Max Credits
ET 6001	VLSI Design	100	3
ET 6002	Computer Networks	100	3
ET 6003	Antenna and Wave Propagation	100	3
ET 6004	Digital Signal Processing	100	3
ET6005	Advanced Microprocessors	100	3
ETP 007	VLSI Design Lab	100	2
ETP 008	Computer Networks Lab	100	2

VII SEMESTER

Subject Code	Subject Title	Max marks	Max Credits
ET 7001	Optical Communication and Networking	100	3
ET 7002	Microwave Engineering	100	3
ET 7003	Industrial Electronics	100	3
	Elective – I	100	3
	Elective - II	100	3
ETP 009	Optical & Microwave Lab	100	2
ETP 010	Industrial Electronics Lab	100	2

VIII SEMESTER

Subject Code	Subject Title	Max marks	Max Credits
ET 8001	Advanced Digital Signal Processing	100	3
	Elective – III	100	3
	Elective - IV	100	3
ETP 011	Electronics System Design Lab	100	2
ETP 012	Project Work	300	6

Total Marks : 5600

Total Credits : 136

Elective Subjects

Subject Code	Subject Title
ETE 001	Medical Electronics
ETE 002	Digital Image Processing
ETE 003	Solid State Electronic Devices
ETE 004	Television and Video Engineering
ETE 005	Nano Electronics
ETE 006	Embedded and Real Time Systems
ETE 007	Advanced Electronic system design
ETE 008	Wireless Sensor Networks

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 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.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, 2005

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 to diagonal form

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 (for First Year),” Second Edition , Tata McGraw–Hill Pub. Co. Ltd., New Delhi, 2002.
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 Publishers, Delhi, 2001.
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, 2000.
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, New Delhi
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 Publications (Pvt) Ltd, New Delhi

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, 2003.
3. Palanisamy P.K., Physics for Engineers, Vol.1 & Vol.2, 2nd Edition, Scitech Publications, Chennai, 2003.
4. Gaur R.K. and Gupta S.L., Engineering Physics, 8th edition, Dhanpat Rai Publications (P) Ltd., New Delhi, 2003.

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 McGraw Hill, New Delhi

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, New Delhi. 2001.
3. Bahl B.S., Tuli G.D., and Arun Bahl, Essentials of Physical Chemistry, S.Chand & Company Ltd., New Delhi, 2004.
4. Kuriacose J.C. & Rajaram J, Chemistry in Engineering & Technology, Vol. 1, Tata McGraw-Hill publishing company, New Delhi, 1996.
5. Introduction to Engineering Chemistry by Minaxi B Lohani, Upma Misra,

S.Chand & Co, New Delhi

6. Engineering Chemistry by Dr.A.K.Pahari,Dr.B.S.Chauhan, Lakshmi Publications (Pvt) Ltd, New Delhi
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 INTRODUCTIONS 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- I
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, 2005

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 Publishers, Delhi, 2001.
2. Kreyzig, E., "Advanced Engineering Mathematics", Eighth Edition, John Wiley & Sons (Asia) Pte, Ltd., Singapore, 2001.
3. Narayanan, S., Manicavachagom Pillay, T.K. and Ramaniah, G., "Advanced Mathematics for Engineering Students", Volumes I and III, S. Viswanathan (Printers and Publishers) Pvt. Ltd., Chennai, 2002.
4. Grewal, B.S., "Higher Engineering Mathematics", Thirty Sixth Edition, Khanna Publishers, Delhi, 2001.
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, 2000.
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 McGraw–Hill Pub. Co. Ltd., New Delhi, 2002.
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 Sons (Asia) Ltd., Singapore, 2001.

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 magnetron
- Unit 2: Weiss theory of Para magnetism, Determination of paramagnetic Susceptibility of a solid
- Unit 3: Ferromagnetism, Anti-ferromagnetic materials and Ferrites magnetic Recording and readout
- 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–Hill Publishing Company Limited, New Delhi, 2003.
4. Palanisamy, P.K., Materials Science, 2nd Edition, Scitech Publications (India), Pvt. Ltd., Chennai, 2003

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., New Delhi, 2003.
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 Haldar, Lakshmi Publications (Pvt) Ltd, New Delhi

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 Technologies 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, New Delhi

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, 17th Ed. 2003.
2. Venugopal K., "Engineering Graphics", New Age International (P) Limited, 2002.
3. Bertoline and Wiebe, Fundamentals of Graphics Communication, Third edition, McGraw-Hill, 2002
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
9. Engineering Graphics by Dhawan R.K, 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
4. IS 11669 - 1986 General Principles of dimensioning 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

Fitting

Sheet Metal

4. ELECTRONIC ENGINEERING PRACTICE

Soldering simple electronic circuits and checking continuity

SEMESTER : III

Subject Code : ET 3001

Subject Title : Mathematics - III

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 : ET 3002
Subject Title : Electrical Machines

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 DC Generators

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

BLOCK 3 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 4 Induction Motor

Unit 1: Single Phase Induction Motor
Unit 2: Special Purpose Induction Motor
Unit 3: Three Phase Induction Motor
Unit 4: Maintenance of Motors

BLOCK 5 Alternators

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

Books:

1. Electrical Machines by SK Bhattacharya, Tata Mc Hill Publishers
2. A Text Book Electrical Technology by BL Theraja, S.Chand Publishers
3. Electrical Technology By JB Gupta, S.K. Kataria & Sons

SEMESTER : III
Subject Code : ET 3003
Subject Title : Data Structures

Structure of the Course Content

BLOCK 1 PROBLEM SOLVING

Unit 1: Top-down Design – Implementation
Unit 2: Verification – Efficiency
Unit 3: Analysis
Unit 4: Sample Algorithm

BLOCK 2 LISTS, STACKS AND QUEUES

Unit 1: Abstract Data Type (ADT)
Unit 2: List ADT
Unit 3: Stack ADT
Unit 4: Queue ADT

BLOCK 3 TREES

Unit 1: Binary Trees
Unit 2: AVL Trees
Unit 3: Tree Traversals and Hashing
Unit 4: Simple implementations of Tree

BLOCK 4 SORTING

Unit 1: Insertion Sort
Unit 2: Shell sort and Heap sort
Unit 3: Merge sort and Quick sort
Unit 4: External Sort

BLOCK 5 GRAPHS

Unit 1: Topological Sort
Unit 2: Path Algorithms
Unit 3: Prim's Algorithm
Unit 4: Undirected Graphs – Bi-connectivity

Books:

1. R. G. Dromey, "How to Solve it by Computer" (Chaps 1-2), Prentice-Hall of India, 2002.
2. M. A. Weiss, "Data Structures and Algorithm Analysis in C", 2nd ed, Pearson Education Asia, 2002.
3. Y. Langsam, M. J. Augenstein and A. M. Tenenbaum, "Data Structures using C", Pearson Education Asia, 2004
3. Richard F. Gilberg, Behrouz A. Forouzan, "Data Structures – A Pseudocode Approach with C", Thomson Brooks / COLE, 1998.
4. Aho, J. E. Hopcroft and J. D. Ullman, "Data Structures and Algorithms", Pearson education Asia, 1983.

SEMESTER : III
Subject Code : ET 3004
Subject Title : Digital Electronics

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, 2003.
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 : III
Subject Code : ET 3005
Subject Title : Electronic Circuits- I

Structure of the Course Content

BLOCK 1 ELECTRON BALLISTICS AND INTRINSIC SEMICONDUCTORS

- Unit 1: Force on charge in electric field and Magnetic field
- Unit 2: calculation of electrostatic and magnetic deflection sensitivity
- Unit 3: Energy band structure
- Unit 4: Semiconductor

BLOCK 2 EXTRINSIC SEMICONDUCTOR AND PN JUNCTIONS

- Unit 1: Types of Extrinsic Semiconductor
- Unit 2: Calculation of location of Fermi level and free electron, hole densities
- Unit 3: Mobility, drift current and conductivity – Diffusion current
- Unit 4: PN Junction

BLOCK 3 SWITCHING CHARACTERISTICS OF PN JUNCTION

- Unit 1: Calculation of transition and diffusion capacitance
- Unit 2: switching characteristics of diode
- Unit 3: Mechanism of avalanche and Zener breakdown
- Unit 4: Special Diodes

BLOCK 4 BIPOLAR JUNCTION TRANSISTORS AND FIELD EFFECT TRANSISTORS

- Unit 1: Types of Transistor and Characteristics
- Unit 2: Base width modulation CB and CE characteristics
- Unit 3: JFET and Its Characteristics
- Unit 4: MOSFET

BLOCK 5 METAL SEMICONDUCTOR CONTACTS AND POWER CONTROL DEVICES

- Unit 1: Metal Semiconductor Contacts
- Unit 2: UJT
- Unit 3: PNP Diode
- Unit 4: Two Transistor Model

Books:

1. Jacob Millman & Christos C.Halkias, “Electronic Devices and Circuits” Tata McGraw–Hill, 1991 .
2. Nandita Das Gupta and Amitava Das Gupta, Semiconductor Devices – Modelling and Technology, Prentice Hall of India, 2004.
3. Donald A.Neaman,” Semiconductor Physics and Devices” 3rd Ed., Tata McGraw-Hill 2002.
4. S.Salivahanan, N.Sureshkumar and A.Vallavaraj, Electronic Devices and Circuits, TMH, 1998.

5. S.M.Sze, Semiconductor Devices – Physics and Technology, 2nd edn. John Wiley, 2002.
6. Ben G.Streetman and Sanjay Banerjee, Solid State Electronic Devices, Pearson Education 2000.

SEMESTER : III
Subject Code : ETP 001
Subject Title : Data structure Lab
Structure of the Course Content

Practical

Implement the following exercises using C:

1. Array implementation of List Abstract Data Type (ADT)
2. Linked list implementation of List ADT
3. Cursor implementation of List ADT
4. Array implementations of Stack ADT
5. Linked list implementations of Stack ADT
6. The following three exercises are to be done by implementing the following source files
 - (a) Program for 'Balanced Paranthesis'
 - (b) Array implementation of Stack ADT
 - (c) Linked list implementation of Stack ADT
 - (d) Program for 'Evaluating Postfix Expressions'
7. An appropriate header file for the Stack ADT should be #included in (a) and (d)
8. Implement the application for checking 'Balanced Paranthesis' using array implementation of Stack ADT (by implementing files (a) and (b) given above)
9. Implement the application for checking 'Balanced Paranthesis' using linked list implementation of Stack ADT (by using file (a) from experiment 6 and implementing file (c))
10. Implement the application for 'Evaluating Postfix Expressions' using array and linked list implementations of Stack ADT (by implementing file (d) and using file (b), and then by using files (d) and (c))
11. Queue ADT
12. Search Tree ADT - Binary Search Tree
13. Heap Sort
14. Quick Sort

SEMESTER : III

Subject Code : ETP 002

Subject Title : Electronic Devices and Circuits Lab I

Structure of the Course Content

Practical

1. Diode Forward characteristics
2. Input and Output characteristics of BJT.
3. Output characteristics of JFET.
4. Fixed Bias amplifier circuits using BJT
5. BJT Amplifier using voltage divider bias (self bias) with unbypassed emitter resistor.
6. Source follower with Bootstrapped gate resistance.
7. Class B Complementary symmetry power amplifier
8. Differential amplifier using BJT.
9. Power supply Full wave rectifier with simple capacitor filter.
10. Measurement of UJT and SCR Characteristics.

SEMESTER : IV
Subject Code : ET 4001
Subject Title : Random Processes

Structure of the Course Content

BLOCK 1 PROBABILITY AND RANDOM VARIABLE

Unit 1: Axioms of probability - Conditional probability
Unit 2: Baye's theorem and Random variable
Unit 3: Probability mass function and density functions
Unit 4: Moment generating functions and their properties.

BLOCK 2 STANDARD DISTRIBUTIONS

Unit 1: Binomial, Poisson, Geometric
Unit 2: Negative Binomial, Uniform, Exponential
Unit 3: Gamma, Weibull and Normal distributions
Unit 4: Functions of a random variable

BLOCK 3 TWO DIMENSIONAL RANDOM VARIABLES

Unit 1: Marginal and conditional distributions
Unit 2: Covariance, Correlation and regression
Unit 3: Transformation of random variables
Unit 4: Central limit theorem

BLOCK 4 Classification of RANDOM PROCESSES

Unit 1: first order, second order, strictly stationary, wide
Unit 2: sense stationary and Ergodic processes
Unit 3: Markov process
Unit 4: Binomial, Poisson and Normal processes

BLOCK 5 Correlation and spectral densities

Unit 1: Auto correlation - Cross correlation
Unit 2: Power and Cross spectral density
Unit 3: Linear time invariant system
Unit 4: Auto correlation and cross correlation functions

Books:

1. Ross, S., "A First Course in Probability", Fifth edition, Pearson Education, Delhi, 2002.
2. Peebles Jr. P.Z., "Probability Random Variables and Random Signal Principles", Tata McGraw-Hill Publishers, Fourth Edition, New Delhi, 2002. (Chapters 6, 7 and 8).
3. Henry Stark and John W. Woods "Probability and Random Processes with Applications to Signal Processing", Pearson Education, Third edition, Delhi, 2002.
4. Veerarajan. T., "Probability, Statistics and Random process", Tata McGraw-Hill Publications, Second Edition, New Delhi, 2002.
5. Ochi, M.K. , "Applied Probability and Stochastic Process", John Wiley & Sons, New York, 1990.

SEMESTER : IV
Subject Code : ET 4002
Subject Title : Electronic Circuits II

Structure of the Course Content

BLOCK 1 FEEDBACK AMPLIFIERS

- Unit 1: Basic Terms and Block diagram of Amplifier
- Unit 2: Four basic feedback topologies
- Unit 3: Method of identifying feedback topology
- Unit 4: Analysis of feedback amplifiers

BLOCK 2 OSCILLATORS

- Unit 1: Analysis of Oscillator using Cascade connection of one RC and one CR Filters
- Unit 2: RC phase shift Oscillator. Wienbridge Oscillator and twin-T Oscillators
- Unit 3: Analysis of LC Oscillators, Colpitts, Hartley, Clapp, Miller and Pierce Oscillators
- Unit 4: Frequency range of RC and LC Oscillators.

BLOCK 3 TUNED AMPLIFIERS

- Unit 1: Analysis of single tuned and synchronously tuned amplifiers
- Unit 2: Stabilization techniques
- Unit 3: Broad banding using Hazeltine neutralization.
- Unit 4: Class C tuned amplifiers

BLOCK 4 WAVE SHAPING AND MULTIVIBRATOR CIRCUITS

- Unit 1: RL & RC Integrator and Differentiator circuits
- Unit 2: Clipper, Clamper and Slicers
- Unit 3: Multivibrators
- Unit 4: Triggering Methods

BLOCK 5 BLOCKING OSCILLATORS AND TIMEBASE GENERATORS

- Unit 1: Monostable and Astable Blocking Oscillators
- Unit 2: Frequency control using core saturation
- Unit 3: Astable blocking oscillator
- Unit 4: Bootstrap and Miller saw-tooth generators

Books:

1. Millman and Halkias. C., "Integrated Electronics", Tata McGraw-Hill 1991,(I,II).
2. Schilling and Belove, "Electronic Circuits", TMH, Third Edition, 2002 (Unit - III)
3. Millman J. and Taub H., "Pulse Digital and Switching waveform", McGraw-Hill International (UNIT – IV & V)
4. Robert L. Boylestead and Louis Nasheresky, 8th edn., PHI, 2002.
5. Sedra / Smith, "Micro Electronic Circuits" Oxford university Press, 2004.
6. David A. Bell, " Solid State Pulse Circuits ", Prentice Hall of India, 1992.

SEMESTER : IV
Subject Code : ET 4003
Subject Title : Electromagnetic Fields

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 : IV
Subject Code : ET 4004
Subject Title : Measurements and Instrumentation

Structure of the Course Content

BLOCK 1 BASIC MEASUREMENT CONCEPTS

- Unit 1: Measurement systems
- Unit 2: Moving coil, moving iron meters
- Unit 3: Multimeters
- Unit 4: Bridge measurements

BLOCK 2 BASIC ELECTRONIC MEASUREMENTS

- Unit 1: Electronic multimeters
- Unit 2: Cathode ray oscilloscopes
- Unit 3: Q meters – Vector meters
- Unit 4: RF voltage and power measurements

BLOCK 3 SIGNAL GENERATORS AND ANALYZERS

- Unit 1: Function generators – RF signal generators
- Unit 2: Sweep generators – Frequency synthesizer
- Unit 3: Wave analyzer – Harmonic distortion analyzer
- Unit 4: Spectrum analyzer

BLOCK 4 DIGITAL INSTRUMENTS

- Unit 1: Comparison of analog and digital techniques
- Unit 2: Digital voltmeter and Multimeter
- Unit 3: Frequency counters – measurement of frequency and time interval
- Unit 4: Extension of frequency range – measurement errors

BLOCK 5 DATA ACQUISITION SYSTEMS AND FIBER OPTIC MEASUREMENTS

- Unit 1: Elements of a digital data acquisition system
- Unit 2: Interfacing of transducers – multiplexing
- Unit 3: Computer controlled instrumentation – IEEE 488 bus
- Unit 4: Fiber optic measurements for power and system loss

Books:

1. Albert D.Helfrick and William D.Cooper – Modern Electronic Instrumentation and Measurement Techniques, Prentice Hall of India, 2003.
2. Joseph J.Carr, Elements of Electronics Instrumentation and Measurement, Pearson education, 2003.
3. Alan. S. Morris, Principles of Measurements and Instrumentation, Prentice Hall of India, 2nd edn., 2003.
4. Ernest O. Doebelin, Measurement Systems- Application and Design-Tata McGraw-Hill-2004.

SEMESTER : IV
Subject Code : ET 4005
Subject Title : Linear Integrated Circuits

Structure of the Course Content

BLOCK 1 CIRCUIT CONFIGURATION FOR LINEAR ICs

- Unit 1: Current sources, Analysis of difference amplifiers with active loads
- Unit 2: Analysis of difference amplifiers with supply and temperature Independent biasing, Band gap references
- Unit 3: Monolithic IC operational amplifiers
- Unit 4: slew rate and methods of improving slew rate.

BLOCK 2 APPLICATIONS OF OPERATIONAL AMPLIFIERS

- Unit 1: Inverting and Non inverting Amplifiers, Differentiator
- Unit 2: Integrator, Voltage to current converter, Instrumentation amplifier
- Unit 3: Filter and Comparator Circuits
- Unit 4: Triggering Circuit, Sine Wave Oscillator and Log Amplifier Circuit

BLOCK 3 ANALOG MULTIPLIER AND PLL

- Unit 1: Analysis of four quadrant (Gilbert cell) and variable trans conductance
- Unit 2: Voltage controlled Oscillator
- Unit 3: Closed loop analysis of PLL, AM, PM and FSK modulators and Demodulation
- Unit 4: Frequency synthesizers, Compander ICs

BLOCK 4 ANALOG TO DIGITAL AND DIGITAL TO ANALOG CONVERTERS

- Unit 1: Basic Terms and Characteristics of Conversions
- Unit 2: Types of D/A Converter
- Unit 3: Types of A/D Converter
- Unit 4: Delta Sigma Modulation, Voltage to Time converters

BLOCK 5 SPECIAL FUNCTION ICs

- Unit 1: Astable and Monostable Multivibrators using 555 Timer
- Unit 2: Voltage regulators
- Unit 3: Tuned amplifiers, Power amplifiers and Isolation Amplifiers
- Unit 4: Video amplifiers, Fiber optic ICs and Opto-couplers

Books:

1. Sergio Franco, 'Design with operational amplifiers and analog integrated circuits', McGraw-Hill, 1997.
2. D.Roy Choudhry, Shail Jain, "Linear Integrated Circuits", New Age International Pvt. Ltd., 2000.
3. Gray and Meyer, 'Analysis and Design of Analog Integrated Circuits', Wiley International, 1995.
4. J.Michael Jacob, 'Applications and Design with Analog Integrated Circuits', Prentice Hall of India, 1996.
5. Ramakant A.Gayakwad, 'OP-AMP and Linear IC's', Prentice Hall / Pearson Education, 1994.

6. K.R.Botkar, 'Integrated Circuits'. Khanna Publishers, 1996.
7. Taub and Schilling, Digital Integrated Electronics, McGraw-Hill, 1997.
8. Millman.J. and Halkias.C.C. 'Integrated Electronics', McGraw-Hill, 1972.
9. William D.Stanely, 'Operational Amplifiers with Linear Integrated Circuits'. Pearson Education, 2004.

SEMESTER : IV
Subject Code : ETP 003
Subject Title : Linear Integrated Circuit Lab

Structure of the Course Content

Practical

1. Inverting, Non inverting and Differential amplifiers.
2. Integrator and Differentiator.
3. Instrumentation amplifier.
4. Active lowpass and bandpass filter.
5. Astable, Monostable multivibrators and Schmitt Trigger using op-amp.
6. Phase shift and Wien bridge oscillator using op-amp.
7. Astable and monostable using NE555 Timer.
8. PLL characteristics and Frequency Multiplier using PLL.
9. DC power supply using LM317 and LM723.
10. Study of SMPS control IC SG3524 / SG3525.

SEMESTER : IV
Subject Code : ETP 004
Subject Title : Digital Electronics 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 : V
Subject Code : ET 5001
Subject Title : Digital Communication Engineering

Structure of the Course Content

BLOCK 1 PULSE MODULATION

- Unit 1: Sampling process and PAM
- Unit 2: PCM System
- Unit 3: Digital Multiplexer
- Unit 4: Delta modulation and linear prediction

BLOCK 2 BASE BAND PULSE TRANSMISSION

- Unit 1: Matched Filter- Error Rate due to noise
- Unit 2: Nyquist's criterion for Distortionless Base band Binary Transmission
- Unit 3: Base B and M-ary PAM transmission
- Unit 4: Adaptive Equalization and Eye patterns

BLOCK 3 PASSBAND DATA TRANSMISSION

- Unit 1: Pass band Transmission model
- Unit 2: Power spectra of BPSK, QPSK, FSK and MSK schemes
- Unit 3: Differential phase shift keying
- Unit 4: Comparison of Digital modulation systems using a single carrier

BLOCK 4 ERROR CONTROL CODING

- Unit 1: Discrete memoryless channels
- Unit 2: Linear block codes - Cyclic codes - Convolutional codes
- Unit 3: Maximum likelihood decoding of convolutional codes
- Unit 4: Viterbi Algorithm, Trellis coded Modulation, Turbo codes

BLOCK 5 SPREAD SPECTRUM MODULATION

- Unit 1: Pseudo and noise sequences
- Unit 2: Direct sequence spread spectrum with coherent binary phase shift keying
- Unit 3: Signal space Dimensionality and processing gain
- Unit 4: hop spread spectrum, Maximum length and Gold codes

Books:

1. Simon Haykins, "Communication Systems" John Wiley, 4th Edition, 2001
2. Sam K. Shanmugam "Analog & Digital Communication" John Wiley.
3. John G. Proakis, "Digital Communication" McGraw Hill 3rd Edition, 1995
4. Taub & Schilling, "Principles of Digital Communication" Tata McGraw-Hill 28th reprint, 2003
5. Bernard's

SEMESTER : V
Subject Code : ET 5002
Subject Title : Microprocessors 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 : V
Subject Code : ET 5003
Subject Title : CONTROL SYSTEMS

Structure of the Course Content

BLOCK 1 CONTROL SYSTEM MODELLING

- Unit 1: System concept
- Unit 2: Modelling of electric systems, translational and rotational mechanical Systems
- Unit 3: Block diagram reduction methods
- Unit 4: Closed loop transfer function, determination of signal flow graph

BLOCK 2 TIME DOMAIN ANALYSIS

- Unit 1: Time response of first order and second order systems
- Unit 2: Types and order of systems
- Unit 3: Steady state errors
- Unit 4: Routh-Hurwitz stability and root locus

BLOCK 3 FREQUENCY DOMAIN ANALYSIS

- Unit 1: Correlation between time and frequency response
- Unit 2: Stability analysis using Bode plots, Polar plots
- Unit 3: Nichols chart and Nyquist stability criterion
- Unit 4: Gain margin and phase margin

BLOCK 4 COMPENSATORS

- Unit 1: Realization of basic compensators
- Unit 2: Cascade compensation in time domain and frequency domain
- Unit 3: Design of lag, lead, lag-lead compensator using Bode plot and Root locus
- Unit 4: P, PI and PID controllers

BLOCK 5 CONTROL SYSTEM COMPONENTS AND APPLICATION OF CONTROL

- Unit 1: Stepper motors and servo motor
- Unit 2: Sensors, encoders and tacho generator
- Unit 3: Hydraulic controller – Pneumatic controller
- Unit 4: Typical application of control system in industry

Books:

1. Ogata.K, Modern Control Engineering, Prentice Hall of India, 4th Edition, 2003 (UNIT I – IV)
2. Nagrath & Gopal, Control System Engineering, 3rd Edition, New Age International Edition, 2002. (UNIT V)
3. Benjamin.C.Kuo, Automatic Control Systems, 7th Edition – Prentice Hall of India, 2002.
4. M.Gopal, Control Systems, Tata McGraw-Hill, 1997

SEMESTER : V
Subject Code : ET 5004
Subject Title : Transmission Lines and Wave guides

Structure of the Course Content

BLOCK 1 TRANSMISSION LINE THEORY

- Unit 1: Different types of transmission lines and its Characteristics
- Unit 2: General Solution of the transmission line
- Unit 3: Waveform distortion
- Unit 4: Input impedance of lossless lines and Transfer impedance

BLOCK 2 LINE AT RADIO FREQUENCIES

- Unit 1: Standing waves and standing wave ratio on a line
- Unit 2: Circle diagram for the dissipationless line
- Unit 3: Smith Chart
- Unit 4: Conversion from impedance to reflection coefficient

BLOCK 3 GUIDED WAVES

- Unit 1: Transverse electric and transverse magnetic waves
- Unit 2: Transverse Electromagnetic waves
- Unit 3: Attenuation of TE and TM waves in parallel plane guides
- Unit 4: Velocities of propagation and Wave impedances.

BLOCK 4 RECTANGULAR WAVEGUIDES

- Unit 1: Transverse Magnetic and Electric Waves in Rectangular Wave guides
- Unit 2: Cut off wavelength and phase velocity
- Unit 3: Dominant mode in rectangular waveguide
- Unit 4: Wave impedances and characteristic impedance

BLOCK 5 CIRCULAR WAVE GUIDES AND RESONATORS

- Unit 1: Solution of field equations in cylindrical co-ordinates
- Unit 2: TM and TE waves in circular guides
- Unit 3: Dominant mode in circular waveguide
- Unit 4: Microwave cavities, Rectangular cavity resonators

Books:

1. J.D.Ryder “Networks, Lines and Fields”, PHI, New Delhi, 2003. (Unit I & II)
2. E.C. Jordan and K.G.Balmain “Electro Magnetic Waves and Radiating System, PHI, New Delhi, 2003. (Unit III, IV & V)
3. Ramo, Whineery and Van Duzer: “Fields and Waves in Communication Electronics” John Wiley, 2003.
4. David M.Pozar: Microwave Engineering – 2nd Edition – John Wiley.
5. David K.Cheng,Field and Waves in Electromagnetism, Pearson Education,

SEMESTER : V
Subject Code : ET 5005
Subject Title : Satellite Communication

Structure of the Course Content

BLOCK 1 OVERVIEW OF SATELLITE SYSTEMS

- Unit 1: Frequency Allocations for Satellite Services
- Unit 2: Definitions of Terms for Earth-orbiting Satellites
- Unit 3: Geocentric-Equatorial Coordinate System
- Unit 4: Sub-satellite Point and Predicting Satellite Position

BLOCK 2 GEOSTATIONARY ORBIT & SPACE SEGMENT

- Unit 1: Antenna
- Unit 2: Earth Eclipse of Satellite
- Unit 3: Attitude Control – Spinning Satellite Stabilization
- Unit 4: Momentum Wheel Stabilization, Station Keeping & Thermal Control

BLOCK 3 EARTH SEGMENT & SPACE LINK

- Unit 1: Receive-Only Home TV Systems
- Unit 2: Indoor Unit for Analog (FM) TV and Master Antenna TV System
- Unit 3: Transmission Losses
- Unit 4: Noise

BLOCK 4 SATELLITE ACCESS

- Unit 1: FDMA
- Unit 2: TDMA
- Unit 3: Code-Division Multiple Access
- Unit 4: Network Layers

BLOCK 5 DIRECT BROADCAST SATELLITE SERVICES

- Unit 1: MPEG Compression Standards
- Unit 2: Uplink and Downlink Analysis
- Unit 3: Satellite Mobile Services
- Unit 4: Global Positioning Satellite System

Books:

1. Dennis Roddy, Satellite Communications, McGraw-Hill Publication Third edition 2001
2. Timothy Pratt – Charles Bostian & Jeremy Allmuti, Satellite Communications, John Willy & Sons (Asia) Pvt. Ltd. 2004
3. Wilbur L. Pritchards Henri G.Suyder Hond Robert A.Nelson, Satellite Communication Systems Engineering, Pearson Education Ltd., Second edition 2003.
4. M.Richharia : Satellite Communication Systems (Design Principles Macmillan Press Ltd. Second Edition 2003.

SEMESTER : V
Subject Code : ETP 005
Subject Title : Communication Systems Lab
Structure of the Course Content

Practical

1. Radiation pattern of Halfwave dipole Antenna
2. Radiation pattern of yagi Antenna
3. Radiation pattern of loop Antenna
4. Characteristics of AM receiver (Selectivity & Sensitivity)
5. Characteristics of FM receiver (Selectivity & Sensitivity)
6. Sampling & time division multiplexing
7. Pulse modulation- PAM / PWM /PPM
8. Pulse code modulation
9. Line Coding & Decoding
10. Delta modulation / Differential pulse code modulation
11. Digital modulation –ASK, PSK, QPSK, FSK

SEMESTER : V
Subject Code : ETP 006
Subject Title : Microprocessor and Microcontroller 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 : ET 6001
Subject Title : VLSI Design

Structure of the Course Content

BLOCK 1 CMOS TECHNOLOGY

- Unit 1: Basic CMOS technology
- Unit 2: Interconnects, circuit elements
- Unit 3: Layout design rules, physical design
- Unit 4: Design Hierarchies

BLOCK 2 MOS TRANSISTOR THEORY

- Unit 1: NMOS, PMOS Enhancement transistor
- Unit 2: MOS DC equations, channel length modulation, Mobility variation
- Unit 3: MOS models, small signal AC characteristics
- Unit 4: CMOS inverter DC characteristics

BLOCK 3 SPECIFICATION USING VERILOG HDL

- Unit 1: VLSI Design flow
- Unit 2: RTL modeling
- Unit 3: Structural gate level description
- Unit 4: Application Circuits

BLOCK 4 Data flow modelling and RTL

- Unit 1: Basic logic gates in CMOS
- Unit 2: Complex logic gates, Transmission gates
- Unit 3: Full custom ASICs, STD
- Unit 4: Programmable logic structures

BLOCK 5 CMOS TESTING

- Unit 1: Need for testing
- Unit 2: manufacturing test principles
- Unit 3: Design strategies for test
- Unit 4: Chip level and system level test techniques.

Books:

1. Weste & Eshraghian: Principles of CMOS VLSI design (2/e) Addison Wesley, 1993 for UNIT I through UNIT IV.
2. Samir Palnitkar; Verilog HDL - Guide to Digital design and synthesis, III edition, Pearson Education, 2003 for UNIT V
3. M.J.S.Smith : Application Specific integrated circuits, Pearson Education, 1997.
4. Wayne Wolf, Modern VLSI Design, Pearson Education 2003.
5. Bob Zeidmin ; Introduction to verilog, Prentice Hall, 1999
6. J . Bhaskar : Verilog HDL Primer, BSP, 2002.
7. E. Fabricious , Introduction to VLSI design, McGraw-Hill 1990.
8. C. Roth, Digital Systems Design Using VHDL, Thomson Learning, 2000.

SEMESTER : VI
Subject Code : ET 6002
Subject Title : Computer Networks

Structure of the Course Content

BLOCK 1 DATA COMMUNICATIONS

Unit 1: Components and Categories
Unit 2: types of Connections
Unit 3: Protocols and Standards
Unit 4: Transmission Media

BLOCK 2 DATA LINK LAYER

Unit 1: Error detection and correction
Unit 2: Parity – LRC – CRC – Hamming code
Unit 3: Flow Control and Error control
Unit 4: HDLC & LAN

BLOCK 3 NETWORK LAYER

Unit 1: Packet Switching and Datagram approach
Unit 2: IP addressing methods
Unit 3: Sub netting
Unit 4: Routing and Routers

BLOCK 4 TRANSPORT LAYER

Unit 1: Duties of transport layer and Multiplexing, De-multiplexing
Unit 2: UDP and TCP
Unit 3: Congestion Control and Quality of services
Unit 4: Integrated Services

BLOCK 5 APPLICATION LAYER

Unit 1: Domain Name Space (DNS)
Unit 2: SMTP, FDP
Unit 3: HTTP, WWW
Unit 4: Security and Cryptography

Books:

1. Behrouz A. Foruzan, “Data communication and Networking”, Tata McGraw-Hill, 2004.
2. James .F. Kurouse & W. Rouse, “Computer Networking: A Topdown Approach Featuring”, Pearson Education.
3. Larry L.Peterson & Peter S. Davie, “COMPUTER NETWORKS”, Harcourt Asia Pvt. Ltd., Second Edition.
4. Andrew S. Tannenbaum, “Computer Networks”, PHI, Fourth Edition, 2003.
5. William Stallings, “Data and Computer Communication”, Sixth Edition, Pearson Education, 2000.

SEMESTER : VI
Subject Code : ET 6003
Subject Title : Antenna and Wave Propagation

Structure of the Course Content

BLOCK 1 RADIATION FIELDS OF WIRE ANTENNAS

- Unit 1: Concept of vector potential
- Unit 2: Power radiated and radiation resistance of current element
- Unit 3: Radiation from half-wave dipole and quarter-wave monopole
- Unit 4: Wire antennas

BLOCK 2 ANTENNA FUNDAMENTALS AND ANTENNA ARRAYS

- Unit 1: Basic Definitions
- Unit 2: Loop Antennas
- Unit 3: Antenna Arrays
- Unit 4: Method of images for antennas

BLOCK 3 TRAVELLING WAVE (WIDEBAND) ANTENNAS

- Unit 1: Analysis and Design of Rhombic antenna
- Unit 2: Self and mutual impedance of antennas
- Unit 3: Two and three element Yagi antennas
- Unit 4: Log periodic antenna

BLOCK 4 APERTURE AND LENS ANTENNAS

- Unit 1: Huygen's Source
- Unit 2: Method of feeding slot antennas
- Unit 3: Reflector type of antennas
- Unit 4: Spherical waves and Biconical antenna

BLOCK 5 PROPAGATION

- Unit 1: Types of propagation
- Unit 2: Sky wave propagation
- Unit 3: Space wave propagation
- Unit 4: Ground wave propagation

Books:

1. E.C.Jordan and Balmain, "Electro Magnetic Waves and Radiating Systems", PHI, 1968, Reprint 2003.
2. John D.Kraus and Ronald Marhefka, "Antennas", Tata McGraw-Hill Book Company, 2002.
3. R.E.Collins, 'Antennas and Radio Propagation ', McGraw-Hill, 1987.
4. Ballany , "Antenna Theory " , John Wiley & Sons, second edition , 2003.

SEMESTER : VI
Subject Code : ET 6004
Subject Title : Digital Signal Processing

Structure of the Course Content

BLOCK 1 FFT

Unit 1: DFT
Unit 2: FFT Algorithm
Unit 3: Radix 2 FFT Algorithm
Unit 4: Decimation in Time and Frequency

BLOCK 2 DIGITAL FILTERS DESIGN

Unit 1: Amplitude and phase responses of FIR filters and Linear phase filters
Unit 2: Windowing techniques for design of Linear phase FIR filters
Unit 3: Frequency sampling techniques
Unit 4: Bilinear transformation

BLOCK 3 FINITE WORD LENGTH EFFECTS

Unit 1: Derivation for quantization noise power
Unit 2: Fixed point and binary floating point number representation
Unit 3: Comparison and over flow error
Unit 4: Signal scaling

BLOCK 4 POWER SPECTRUM ESTIMATION

Unit 1: Computation of Energy density spectrum
Unit 2: Auto correlation and power spectrum of random signals
Unit 3: Periodogram – use of DFT in power spectrum estimation
Unit 4: Non parametric methods for power spectral estimation

BLOCK 5 DIGITAL SIGNAL PROCESSORS

Unit 1: DSP architecture
Unit 2: Advanced addressing modes
Unit 3: Pipelining
Unit 4: instruction set of TMS320C5X and C54X

Books:

1. John G Proakis, Dimtris G Manolakis, Digital Signal Processing Principles, Algorithms and Application, PHI, 3rd Edition, 2000,
2. B.Venkataramani & M. Bhaskar, Digital Signal Processor Architecture, Programming and Application, TMH 2002. (UNIT – V)
3. Alan V Oppenheim, Ronald W Schafer, John R Back, Discrete Time Signal Processing, PHI, 2nd Edition 2000,
4. Avtar singh, S.Srinivasan DSP Implementation using DSP microprocessor with Examples from TMS32C54XX -Thamson / Brooks cole Publishers, 2003
5. S.Salivahanan, A.Vallavaraj, Gnanapriya, Digital Signal Processing, McGraw-Hill / TMH, 2000
6. Johny R.Johnson :Introduction to Digital Signal Processing, Prentice Hall,
7. S.K.Mitra, “Digital Signal Processing- A Computer based approach”, Tata McGraw-Hill, 1998, New Delhi.

SEMESTER : VI
Subject Code : ET 6005
Subject Title : Advanced Microprocessors

Structure of the Course Content

BLOCK 1 ADVANCED MICROPROCESSOR ARCHITECTURE

- Unit 1: Internal Microprocessor Architecture
- Unit 2: Real mode memory addressing – Protected Mode Memory addressing
- Unit 3: Data and Program memory addressing modes
- Unit 4: Data movement, Program control, Arithmetic and Logic instructions

BLOCK 2 MODULAR PROGRAMMING AND ITS CONCEPTS

- Unit 1: Modular programming
- Unit 2: Data Conversions
- Unit 3: Disk files
- Unit 4: Interrupt hooks- using assembly languages with C/ C++

BLOCK 3 PENTIUM PROCESSORS

- Unit 1: Introduction to Pentium Microprocessor
- Unit 2: Special Pentium registers and memory management
- Unit 3: New Pentium Processor and Special Pentium pro features
- Unit 4: Pentium 4 processor

BLOCK 4 16-BIT MICRO CONTROLLERS

- Unit 1: 8096/8097 Architecture-CPU registers
- Unit 2: RALU-Internal Program and Data memory Timers
- Unit 3: High speed Input and Output –Serial Interface-I/O ports
- Unit 4: Interrupts –A/D converter-Watch dog timer –Power down feature

BLOCK 5 RISC PROCESSORS AND ARM

- Unit 1: RISC Architecture
- Unit 2: RISC Pipe lining
- Unit 3: ARM Processor
- Unit 4: ARM instruction and Branching instruction

Books:

1. Barry B.Brey, The Intel Microprocessors 8086/8088, 80, 86, 80286, 80386 80486, Pentium, Pentium Pro Processor, Pentium II, Pentium III, Pentium 4, Architecture, Programming and interfacing, Prentice Hall of India Private Limited, New Delhi, 2003. (UNIT I, II and III)
2. John Peatman, Design with Microcontroller McGraw Hill Publishing Co Ltd, New Delhi. (UNIT IV)
3. Alan Clements, “The principles of computer Hardware”, Oxford University Press, 3rd Edition, 2003. (UNIT V)
4. Rajkamal, The concepts and feature of micro controllers 68HC11, 8051 and 8096; S Chand Publishers, New Delhi.

SEMESTER : VI
Subject Code : ETP 007
Subject Title : VLSI Design Lab
Structure of the Course Content

Practical

1. Study of Simulation using tools
2. Study of Synthesis tools
3. Place and Root and Back annotation for FPGAs
4. Study of development tool for FPGAs for schematic entry and verilog
5. Design of traffic light controller using verilog and above tools
6. Design and simulation of pipelined serial and parallel adder to add/ subtract 8 number of size, 12 bits each in 2's complement
7. Design and simulation of back annotated verilog files for multiplying two signed, 8 bit numbers in 2's complement. Design must be pipelined and completely RTL compliant
8. Study of FPGA board and testing on board LEDs and switches using verilog codes
9. Testing the traffic controller design developed in SI. NO.5 on the FPGA board
10. Design a Real time Clock (2 digits, 7 segments LED displays each for HRS., MTS, and SECS.) and demonstrate its working on the FPGA board. An expansion card is required for the displays.

SEMESTER : VI
Subject Code : ETP 008
Subject Title : Computer Networks Lab
Structure of the Course Content

Practical

1. PC to PC Communication
 - a. Parallel Communication using 8 bit parallel cable
 - b. Serial communication using RS 232C
2. Ethernet LAN protocol
3. To create scenario and study the performance of CSMA/CD protocol ethrol simulation
4. Token bus and token ring protocols
5. To create scenario and study the performance of token bus and token ring protocols through simulation
6. Wireless LAN protocols
7. To create scenario and study the performance of network with CSMA / CA protocol and compare with CSMA/CD protocols.
8. Implementation and study of stop and wait protocol
9. Implementation and study of Goback-N and selective ret protocols
10. Implementation of distance vector routing algorithm
11. Implementation of Link state routing algorithm
12. Implementation of Data encryption and decryption
13. Transfer of files from PC to PC using Windows / Unix socket processing

SEMESTER : VII
Subject Code : ET 7001
Subject Title : Optical Communication and Networking

Structure of the Course Content

BLOCK 1 INTRODUCTION TO OPTICAL FIBERS

- Unit 1: Element of an Optical Fiber Transmission link
- Unit 2: Optical Fiber Modes and Configurations
- Unit 3: Mode theory of Circular Wave guides
- Unit 4: Single Mode Fibers and Graded Index fiber structure

BLOCK 2 SIGNAL DEGRADATION OPTICAL FIBERS

- Unit 1: Attenuation and Signal losses
- Unit 2: Distortion in Optical Wave guides
- Unit 3: Wave guide Dispersion, Signal distortion in SM Fiber
- Unit 4: Design Optimization of SM fibers-RI profile

BLOCK 3 FIBER OPTICAL SOURCES AND COUPLING

- Unit 1: Direct and indirect Band gap materials
- Unit 2: LED Structures
- Unit 3: Laser Diodes
- Unit 4: Fibre –to- Fibre joints, Fibre splicing

BLOCK 4 FIBER OPTICAL RECEIVERS

- Unit 1: PIN and APD diodes
- Unit 2: Photo detector noise, SNR, Detector Response time, Avalanche Multiplication Noise
- Unit 3: Fundamental Receiver Operation
- Unit 4: Receiver Configuration

BLOCK 5 DIGITAL TRANSMISSION SYSTEMS

- Unit 1: Point-to-Point links System considerations
- Unit 2: Operational Principles of WDM
- Unit 3: Solitons-Erbium-doped Amplifiers
- Unit 4: Basic concepts of SONET/SDH Network

Books:

1. Gerd Keiser, “Optical Fiber Communication” McGraw –Hill International, Singapore, 3rd ed., 2000
2. J.Senior, “Optical Communication, Principles and Practice”, Prentice Hall of India, 1994.
3. J.Gower, “Optical Communication System”, Prentice Hall of India, 2001.

SEMESTER : VII
Subject Code : ET 7002
Subject Title : Microwave Engineering

Structure of the Course Content

BLOCK 1 Introduction

- Unit 1: Basic Terms and Definitions
- Unit 2: Waveguide Tees, Magic Tees (Hybrid Trees) and Hybrid Rings
- Unit 3: S Matrix of a Directional Coupler
- Unit 4: Microwave Circulators and Isolators

BLOCK 2 Modes of Microwaves

- Unit 1: Transit time limitations in transistors, Microwave bipolar transistors
- Unit 2: HEMT, Gunn effect – RWH theory
- Unit 3: Field domain and modes of operation microwave amplification
- Unit 4: IMPATT and TRAPATT diodes and comparison parametric amplifiers

BLOCK 3 TED's and ATED

- Unit 1: Gunn-Effect Diodes – GaAs Diode
- Unit 2: Ridley-Watkins-Hilsum (RWH) Theory
- Unit 3: LSA Diodes, InP Diodes, CdTe Diodes
- Unit 4: AVALANCHE TRANSIT-TIME DEVICES

BLOCK 4 MICROWAVE LINEAR-BEAM TUBES

- Unit 1: Klystrons, Reentrant Cavities, Velocity-Modulation Process, Bunching Process
- Unit 2: Multicavity Klystron Amplifiers, Beam-Current Density
- Unit 3: Power of Two and Four -Cavity Klystron and Reflex Klystrons
- Unit 4: Helix Traveling-Wave Tubes (TWTs), Slow-Wave structures

BLOCK 5 MICROWAVE MEASUREMENTS

- Unit 1: Slotted line VSWR measurement
- Unit 2: VSWR through return loss measurements
- Unit 3: measurement insertion loss and attenuation measurements
- Unit 4: Measurement of 1 dB, dielectric constant measurement of a solid using Waveguide

Books:

1. Samuel Y.LIAO : Microwave Devices and Circuits – Prentice Hall of India – 3rd Edition (2003)
2. Annapurna Das and Sisir K.Das: Microwave Engineering – Tata McGraw-Hill (2000) (UNIT V)
3. R.E. Collin : Foundations for Microwave Engg. – IEEE Press Second Edition (2002)
4. David M.POZAR : Microwave Engg. – John Wiley & Sons – 2nd Edition (2003)
5. P.A.RIZZI – Microwave Engg. (Passive ckts) – PH1

SEMESTER : VII
Subject Code : ET 7003
Subject Title : Industrial Electronics

Structure of the Course Content

BLOCK 1 POWER ELECTRONICS DEVICES

- Unit 1: Characteristics of SCR, diac, triac, SCS
- Unit 2: Characteristics of GTO, PUJT – power transistors
- Unit 3: Characteristics of power FETs – LASCR
- Unit 4: Protection of thyristors

BLOCK 2 TRIGGERING TECHNIQUES

- Unit 1: Turn on circuits for SCR
- Unit 2: Triggering with single pulse and train of pulses
- Unit 3: Synchronizing with supply – triggering with microprocessor
- Unit 4: Forced commutation

BLOCK 3 CONTROLLED RECTIFIERS

- Unit 1: Single Phase half controlled and fully controlled rectifiers
- Unit 2: Three Phase half controlled and fully controlled rectifiers
- Unit 3: Effect of transformer leakage inductance
- Unit 4: Dual converter.

BLOCK 4 INVERTERS

- Unit 1: Voltage and current source inverters
- Unit 2: Series and PWM inverter
- Unit 3: AC and DC choppers and DC to DC converters
- Unit 4: Buck, boost Converter

BLOCK 5 INDUSTRIAL APPLICATIONS

- Unit 1: DC motor drives
- Unit 2: Induction and synchronous motor drives
- Unit 3: switched reluctance and brushless motor drives
- Unit 4: SMPS – UPS

Books:

1. Muhamed H.Rashid : Power Electronics Circuits, Devices and Applications, 3rd Edn. 2004 PHI.
2. Singh and Kanchandani : Power Electronics, TMH, 1998.
3. Sen : Power Electronics, TMH, 1987.
4. Dubey : Thyristorised power controllers, Wiley Eastern 1986.
5. Vithayathil : Power Electronics – Principles and applications McGraw-Hill, 1995.
6. Lander : Power Electronics, 3rd Edition, McGraw-Hill, 1994.

SEMESTER : VII
Subject Code : ETP 009
Subject Title : Optical & Microwave Lab
Structure of the Course Content

Practical

Experiments pertaining to Fiber optics, Optical Communication and Fiber optic sensors:

1. Numerical aperture determination for fibers and Attenuation Measurement in Fibers.
2. Mode Characteristics of Fibres – SM Fibres.
3. Coupling Fibers to Semi-Conductor Sources – Connectors & Splices.
4. Fiber optic communication links.
5. LED & Photo Diode Characteristics.

Microwave experiments

6. VSWR Measurements – Determination of terminated impedance
7. Determination of guide wavelength, frequency measurement.
8. Radiation Pattern of Horns, Paraboloids.
9. Microwave Power Measurement.
10. Characteristics of Gunn diode Oscillator.

SEMESTER : VII
Subject Code : ETP 010
Subject Title : Industrial Electronics Lab
Structure of the Course Content

Practical

1. Construct and test commutation circuits of SCR.
2. Construct and test a single phase inverter.
3. Construct and test a MOSFET based PWM chopper circuit.
4. Construct and test a multiple pulse sine wave inverter.
5. Construct and test an IC based buck converter using PWM.
6. Write and implement a simple ladder logic program using digital inputs and
7. Outputs for PLC.
8. Write the implement a simple ladder logic program using timer and counter with Branching and subroutines with PLC.
9. Write and implement a simple ladder logic program for interfacing a lift control With PLC.
10. Write and implement a simple ladder logic program for interfacing a conveyor control with PLC.

SEMESTER : VIII
Subject Code : ET 8001
Subject Title : Advanced 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.

SEMESTER : VIII
Subject Code : ETP 011
Subject Title : Electronics System Design Lab
Structure of the Course Content

Practical

1. DC power supply design using buck – boost converters
Design the buck-boost converter for the given input voltage variation, load current and output voltage. Plot the regulation characteristics.
2. DC power supply design using fly back converter (Isolated type)
Design the fly back converter using ferrite core transformer for the given input voltage variation load current and output voltage.
Plot the regulation characteristics.
3. Design of a 4-20mA transmitter for a bridge type transducer.
Design the Instrumentation amplifier with the bridge type transducer (Thermistor or any resistance variation transducers) and convert the amplified voltage from the instrumentation amplifier to 4 – 20 mA current using op-amp. Plot the variation of the temperature Vs output current.
4. Design of AC/DC voltage regulator using SCR
Design a phase controlled voltage regulator using full wave rectifier and SCR, vary the conduction angle and plot the output voltage.
5. Design of process control timer
Design a sequential timer to switch on & off at least 3 relays in a particular sequence using timer IC.
6. Design of AM / FM modulator / demodulator
 - i. Design AM signal using multiplier IC for the given carrier frequency and modulation index and demodulate the AM signal using envelope detector.
 - ii. Design FM signal using VCO IC NE566 for the given carrier frequency and demodulate the same using PLL NE 565.
7. Design of Wireless data modem.
Design a FSK modulator using 555 and convert it to sine wave using filter and transmit the same using IR LED and demodulate the same PLL NE 565.
8. PCB layout design using CAD
Drawing the schematic of simple electronic circuit and design of PCB layout

using CAD

9. Microcontroller based systems design

Design of microcontroller based system for simple applications like security systems combination lock etc. using 89c series flash micro controller.

10. DSP based system design

Design a DSP based system for simple applications like echo generation, etc. using TMS 320 DSP kit.

SEMESTER : VIII
Subject Code : ETP 012
Subject Title : Project Work
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 Electronics Engineering. Every Project Work shall have a Guide who is a member of the faculty of Electronics 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.

Subject Code : ETE 001
Subject Title : Medical Electronics

Structure of the Course Content

BLOCK 1 ELECTRO-PHYSIOLOGY AND BIO-POTENTIAL RECORDING

Unit 1: Bio-potentials and Bio Amplifier

Unit 2: ECG, EEG, EMG

Unit 3: PCG, EOG

Unit 4: Lead systems and recording methods

BLOCK 2 BIO-CHEMICAL AND NON ELECTRICAL PARAMETER MEASUREMENTS

Unit 1: PH, PO₂, PCO₂, PHCO₃

Unit 2: Electrophoresis, colorimeter, photometer

Unit 3: Auto analyzer, Blood flow meter, cardiac output

Unit 4: Measurement, Blood pressure, temperature, pulse, Blood cell counters

BLOCK 3 ASSIST DEVICES AND BIO-TELEMETRY

Unit 1: Cardiac pacemakers, DC Defibrillator

Unit 2: Telemetry principles

Unit 3: Frequency selection, Bio-telemetry

Unit 4: Radio-pill and tele-stimulation

BLOCK 4 RADIOLOGICAL EQUIPMENTS

Unit 1: Ionising radiation

Unit 2: Diagnostic x-ray equipments

Unit 3: Radio Isotope in diagnosis

Unit 4: Radiation Therapy

BLOCK 5 RECENT TRENDS IN MEDICAL INSTRUMENTATION

Unit 1: Thermograph, endoscopy unit

Unit 2: Laser in medicine

Unit 3: Diathermy units

Unit 4: Electrical safety in medical equipment

Books:

1. Leislle Cromwell, "Biomedical instrumentation and measurement", Prentice Hall of India, New Delhi, 2002.
2. Khandpur, R.S., "Handbook of Biomedical Instrumentation", TATA McGraw-Hill, New Delhi, 1997.
3. Joseph J.Carr and John M.Brown, "Introduction to Biomedical equipment Technology", John Wiley and Sons, New York, 1997.

Subject Code : ETE 002
Subject Title : Digital Image Processing

Structure of the Course Content

BLOCK 1 DIGITAL IMAGE FUNDAMENTALS AND TRANSFORMS

Unit 1: Image sampling and quantization Basic relationship between pixels

Unit 2: Fourier Transform and DFT

Unit 3: FFT

Unit 4: Discrete Cosine Transform, Haar, Slant, Karhunen and Loeve Transforms

BLOCK 2 IMAGE ENHANCEMENT TECHNIQUES

Unit 1: Spatial Domain methods

Unit 2: Image subtraction and Image averaging

Unit 3: Spatial filtering

Unit 4: Frequency domain filters

BLOCK 3 IMAGE RESTORATION

Unit 1: Model of Image Degradation/restoration process

Unit 2: Noise models and Inverse filtering

Unit 3: Constrained least mean square filtering

Unit 4: Pseudo inverse – Singular value decomposition.

BLOCK 4 IMAGE COMPRESSIONS

Unit 1: Lossless compression

Unit 2: Lossy Compression

Unit 3: Basics of Image compression standards

Unit 4: Basics of Vector quantization

BLOCK 5 IMAGE SEGMENTATION AND REPRESENTATION

Unit 1: Edge detection – Thresholding - Region Based segmentation

Unit 2: Boundary representation

Unit 3: Simple descriptors-Fourier descriptors

Unit 4: Regional descriptors –Simple descriptors of Texture

Books:

1. Rafael C Gonzalez, Richard E Woods 2nd Edition, Digital Image Processing - Pearson Education 2003.
2. William K Pratt, Digital Image Processing John Willey (2001)
3. Image Processing Analysis and Machine Vision – Millman Sonka, Vaclav hlavac, Roger Boyle, Broos/colic, Thompson Larniy (1999).
4. A.K. Jain, PHI, New Delhi (1995)-Fundamentals of Digital Image Processing.
5. Chanda Dutta Magundar – Digital Image Processing and Applications, Prentice Hall of India, 2000

Subject Code : ETE 003
Subject Title : Solid State Electronic Devices

Structure of the Course Content

BLOCK 1 CRYSTAL PROPERTIES AND GROWTH OF SEMICONDUCTORS

- Unit 1: Periodic Structures and Crystal, Cubic and Diamond lattices
- Unit 2: Bulk Crystal Growth
- Unit 3: Wafer and Doping
- Unit 4: Photoelectric Effect and Bohr Model

BLOCK 2 ENERGY BANDS AND CHARGE CARRIERS IN SEMICONDUCTORS

- Unit 1: Bonding Forces and Energy bands in Solids
- Unit 2: Bands-Metals, Semiconductors, and Insulators
- Unit 3: Direct and Indirect Semiconductors
- Unit 4: Effective Mass-Intrinsic Material-Extrinsic Material

BLOCK 3 JUNCTIONS

- Unit 1: Fabrication of P-N Junctions
- Unit 2: Bias Forward, Reverse and Breakdown Region
- Unit 3: Varactor Diode and Schottly Diode Region
- Unit 4: Effects of contact Potential on carrier injection

BLOCK 4 THE METAL –SEMICONDUCTOR-FET

- Unit 1: GaAS MESFET
- Unit 2: Metal Insulator Semiconductor FET
- Unit 3: MOS Capacitor
- Unit 4: Mobility Models-Short channel MOSFET

BLOCK 5 OPTOELECTRONIC DEVICES

- Unit 1: Photodiodes and LED
- Unit 2: Lasers
- Unit 3: Silicon –on – Insulator (SOI)-
- Unit 4: CCD and ULSI

Books:

1. Ben.G.Streetman & Sanjan Banerjee Solid State Electronic Devices (5th Edition) PHI Private Ltd, 2003
2. Yannis Tsividis: Operation & Mode line of The MOS Transistor (2nd Edition) Oxford University Press, 1999
3. Nandita Das Gupta &Aamitava Das Gupta- Semiconductor Devices Modeling a Technology, PHI, 2004.

Subject Code : ETE 004
Subject Title : Television and Video Engineering

Structure of the Course Content

BLOCK 1 FUNDAMENTALS OF TELEVISION

Unit 1: Geometry form and Aspect Ratio - Image Continuity

Unit 2: Scanning and Picture Resolutions

Unit 3: Camera tubes- Image orthicon and Picture Tube

Unit 4: VSB transmission sound signal transmission

BLOCK 2 MONOCHROME TELEVISION TRANSMITTER AND RECEIVER

Unit 1: TV transmitter and Signal propagation, Antenna

Unit 2: RF, UHF and VHF tuner

Unit 3: Digital tuning techniques

Unit 4: Video and sound inter carrier detection

BLOCK 3 ESSENTIALS OF COLOUR TELEVISION

Unit 1: Three Color Theory

Unit 2: Colour television Camera

Unit 3: In-line and Trinitron colour picture tubes

Unit 4: Colour signal transmission

BLOCK 4 COLOUR TELEVISION SYSTEMS

Unit 1: NTSC colour TV system

Unit 2: PAL –D colour system- PAL coder

Unit 3: U and V signals

Unit 4: SECAM system

BLOCK 5 ADVANCED TELEVISION SYSTEMS

Unit 1: Satellite TV technology

Unit 2: Cable TV – VCR- Video Disc recording and playback

Unit 3: Digital television

Unit 4: Sterio sound in TV – 3D TV – EDTV

Books:

1. R.R.Gulati, “ Monochrome Television Practice, Principles, Technology and servcing , Second edition, New age International Publishes, 2004 (Unit I,II,IV and V)
2. R.R.Gulati “Monochrome and colour television “, New age International Publisher, 2003 (Unit I,III and IV)
3. A.M Dhake, “Television and Video Engineerign”, Second edition, TMH, 2003.
4. S.P.Bali, “ Colour Television, Theory and Practice”, TMH, 1994

Subject Code : ETE 005

Subject Title : Nano Electronics

Structure of the Course Content

BLOCK 1 INTRODUCTION TO NANOTECHNOLOGY

Unit 1: Types of nanotechnology and nano machines

Unit 2: Molecular Nanotechnology

Unit 3: Scanning electron microscope

Unit 4: Nanomaterials

BLOCK 2 FUNDAMENTALS OF NANO ELECTRONICS

Unit 1: Fundamentals of logic devices

Unit 2: Classification of Logic Devices

Unit 3: Quantum cellular automata

Unit 4: DNA computer

BLOCK 3 SILICON MOSFETs & QUANTUM TRANSPORT DEVICES

Unit 1: Novel materials and alternate concepts

Unit 2: Silicon-dioxide based gate dielectrics

Unit 3: Advanced MOSFET concepts

Unit 4: Quantum transport devices based on resonant tunneling

BLOCK 4 CARBON NANOTUBES

Unit 1: Carbon Nanotube

Unit 2: Synthesis of carbon nanotubes

Unit 3: Carbon nanotube FETs

Unit 4: Nanotube for memory applications

BLOCK 5 MOLECULAR ELECTRONICS

Unit 1: Electrodes, contacts and functions

Unit 2: Simulation and circuit design – fabrication;

Unit 3: Robots

Unit 4: Random access memory – Mass storage devices.

Books:

1. Michael Wilson, Kamali Kannangara, Geoff Smith, Michelle Simmons and Burkhard
2. Raguse, Nanotechnology: Basic Science and Emerging Technologies, Chapman & Hall / CRC, 2002
3. T. Pradeep, NANO: The Essentials – Understanding Nanoscience and Nanotechnology, TMH, 2007
4. Rainer Waser (Ed.), Nanoelectronics and Information Technology: Advanced Electronic Materials and Novel Devices, Wiley-VCH, 2003

Subject Code : ETE 006

Subject Title : Embedded and Real Time Systems

Structure of the Course Content

BLOCK 1 INTRODUCTION TO EMBEDDED SYSTEMS

Unit 1: Overview of Processors and hardware units

Unit 2: Software embedded into the system

Unit 3: Exemplary Embedded Systems

Unit 4: Embedded Systems on a Chip

BLOCK 2 DEVICES AND BUSES FOR DEVICES NETWORK

Unit 1: I/O Devices

Unit 2: Synchronous and Asynchronous Communications from Serial Devices

Unit 3: Parallel Port Devices

Unit 4: '12C', 'USB', 'CAN' and advanced I/O Serial high speed buses

BLOCK 3 EMBEDDED PROGRAMMING IN C, C++

Unit 1: C Program Elements, Macros, functions and Pointers

Unit 2: Function Queues and Interrupt Service Routines Queues Pointers

Unit 3: Embedded Programming in C++,

Unit 4: 'C' Program compilers – Cross compiler

BLOCK 4 Needs of RTOS

Unit 1: Process, tasks and threads

Unit 2: Operating System Services

Unit 3: File System Organisation and Implementation

Unit 4: Interrupt Routines Handling in RTOS

BLOCK 5 Real Time Operating System

Unit 1: RTOS Task scheduling models

Unit 2: INTER PROCESS COMMUNICATION

Unit 3: INTER PROCESS SYNCHRONISATION

Unit 4: Study of Micro C/OS-II or Vx Works or Any other popular RTOS

Books:

1. Rajkamal, Embedded Systems Architecture, Programming and Design, TATA McGraw-Hill, First reprint Oct. 2003
2. Steve Heath, Embedded Systems Design, Second Edition-2003, Newnes,
3. David E.Simon, An Embedded Software Primer, Pearson Education Asia, First Indian Reprint 2000.
4. Wayne Wolf, Computers as Components; Principles of Embedded Computing System Design – Harcourt India, Morgan Kaufman Publishers, First Indian Reprint 2001
5. Frank Vahid and Tony Givargis, Embedded Systems Design – A unified Hardware /Software Introduction, John Wiley, 2002.

Subject Code : ETE 007
Subject Title : Advanced Electronic system design

Structure of the Course Content

BLOCK 1 INTRODUCTION TO RF DESIGN

- Unit 1: Chip components and circuit board considerations
- Unit 2: Impedance and admittance transformation, Parallel and series Connection of networks
- Unit 3: Basic resonator and filter configurations
- Unit 4: Implementation of micro strip filter design

BLOCK 2 RF TRANSISTOR AMPLIFIER DESIGN

- Unit 1: Impedance matching using discrete components
- Unit 2: Micro strip line matching networks
- Unit 3: Amplifier classes of operation and biasing networks
- Unit 4: Simple input and output matching networks & Bilateral design

BLOCK 3 DESIGNS OF POWER SUPPLIES

- Unit 1: DC power supply design using transistors and SCRs
- Unit 2: Design of crowbar and fold back protection circuits
- Unit 3: Switched mode power supplies
- Unit 4: Boost converters

BLOCK 4 DESIGNS OF DATA ACQUISITION SYSTEMS

- Unit 1: Amplification of Low level signals, Grounding, Shielding and Guarding Techniques
- Unit 2: Dual slope, quad slope and high speed A/D converters
- Unit 3: Microprocessors Compatible A/D converters
- Unit 4: Multiplying A/D converters and Logarithmic A/D converters

BLOCK 5 DESIGNS OF PRINTED CIRCUIT BOARDS

- Unit 1: Introduction to technology of printed circuit boards
- Unit 2: PCB design rules for Digital
- Unit 3: Analog, Power Electronics and Microwave circuits
- Unit 4: Computer Aided design of PCBs

Books:

1. Reinhold Luduig and Pavel Bretchko, RF Circuit Design – Theory and Applications, Pearson Education, 2000.
2. Sydney Soclof, “Applications of Analog Integrated Circuits”, Prentice Hall of India, 1990.
3. Walter C.Bosshart, “Printed circuit Boards – Design and Technology”, TATA McGraw-Hill, 1983.
4. Keith H.Billings, “Handbook of Switched Mode Supplies” McGraw-Hill Publishing Co., 1989.
5. Michael Jaacob, “Applications and Design with Analog Integrated Circuits” Prentice Hall of India, 1991.
6. Otmar Kigenstein, “Switched Mode Power supplies in Practice”, John Wiley and Sons, 1989.
7. Muhammad H.Rashid, Power Electronics – Circuits, Devices and Applications, Prentice Hall of India, 2004.

Subject Code : ETE 008
Subject Title : Wireless Sensor Networks

Structure of the Course Content

BLOCK 1 PHYSICAL AND WIRELESS MAC LAYER

ALTERNATIVES

- Unit 1: Wired transmission techniques
- Unit 2: Applied wireless transmission techniques
- Unit 3: Integration of voice and data traffic
- Unit 4: Random access for data oriented networks

BLOCK 2 WIRELESS NETWORK PLANNING AND OPERATION

- Unit 1: Wireless networks topologies
- Unit 2: Cellular topology
- Unit 3: Channel borrowing techniques, DCA
- Unit 4: Mobility management, radio resources and power management

BLOCK 3 WIRELESS WAN

- Unit 1: IS-95 CDMA
- Unit 2: IMT – 2000
- Unit 3: W-CDMA
- Unit 4: GPRS

BLOCK 4 WIRELESS LAN

- Unit 1: Wireless home networking
- Unit 2: IEEE 802.11
- Unit 3: ATM, HYPER LAN
- Unit 4: HYPER LAN – 2

BLOCK 5 WPAN AND GEOLOCATION SYSTEMS

- Unit 1: IEEE 802.15 WPAN
- Unit 2: Bluetooth and 802.11
- Unit 3: Wireless geo-location technologies
- Unit 4: Geo-location standards for E.911 service

Books:

1. 1.Kaveh Pahlavan, Prashant Krishnamoorthy, Principles of Wireless Networks, - A united approach - Pearson Education, 2002.
2. Jochen Schiller, Mobile Communications, Person Education – 2003, 2nd Edn.
3. X.Wang and H.V.Poor, Wireless Communication Systems, Pearson education, 2004.
4. M.Mallick, Mobile and Wireless design essentials, Wiley Publishing Inc. 2003.
5. P.Nicopolitidis, M.S.Obaidat, G.I. papadimitria, A.S. Pomportsis, Wireless Networks, John Wiley & Sons, 2003.