Inspiring Education for Aspiring Engineers

G. Pulla Reddy Engineering College

(Autonomous)

KURNOOL - 518 007.

Accredited by NBA of AICTE and NAAC of UGC

An ISO 9001 : 2008 Certified Institution

Affiliated to JNTUA, Anantapur.

Sponsored and Managed by Gunampalli Pulla Reddy Charities Trust

SCHEME - 2010

Scheme & Syllabus For II, III & IV Years of Four Year B.Tech. Degree Course

(With effect from the batch admitted in 2010 - 2011)

FOUR YEAR B.TECH. DEGREE COURSE

Scheme of Instruction and Examination

(Effective from 2010-2011)

II B.Tech (ECE) – I Semester **Scheme : 2010**

S. No	Subject	Abbreviation	Credits	Scheme of Instruction periods/week			Duration of End Exam (Hours)	Scheme of Examination Maximum Marks		
				L	D/T	P		End Exam	Internal Assessment	Total
I	**Theory**									
1.	Managerial Economics and Financial Accounting	MEFA	**4**	**4**	**0**	–	3	70	30	100
2.	Engineering Mathematics - III	EM3	**5**	**4**	**1**	–	3	70	30	100
3.	Electronics Devices and Circuits	EDC	**4**	**4**	**0**	–	3	70	30	100
4.	Pulse and Digital Electronics	PDE	**5**	**4**	**1**	–	3	70	30	100
5.	Circuit Theory	CT	**5**	**4**	**1**	–	3	70	30	100
6.	Electromagnetics	EMG	**5**	**4**	**1**	–	3	70	30	100
7.	Soft Skills	SS	**2**	**1**	**2**	–	–	–	100	100
II	**Practical**									
8.	Pulse and Digital Electronics Lab	PDE(P)	**2**	–	–	**3**	3	70	30	100
9.	Electronic Devices Lab	ED(P)	**2**	–	–	**3**	3	70	30	100
	Total		**34**	**25**	**6**	**6**		**560**	**340**	**900**

MANAGERIAL ECONOMICS AND FINANCIAL ACCOUNTING (MEFA)
(Common to II B.Tech. - I Semester ECE, CSE & CSIT)

Scheme :2010
Contact Periods: 4L / week
Credits: 4

Internal Assessment : 30
End Exam Marks : 70
End Exam Duration : 3hrs

Course Objectives:

- To develop the students in organized accelerated and analytical skills necessary for the Managerial and financial Profession.
- To aware the students in their responsibilities for professional improvement during the remainder of their career.

Unit-I

Introduction to Managerial Economics: Definition – Nature and Scope of Managerial Economics – Demand Analysis – Types of Demand – Demand Determinants – Law of Demand – Its assumptions and exceptions.

Unit-II

Elasticity of Demand: Definition –Types – Price – Income – Cross Elasticities of demand – Practical Significance of price elasticity of demand – Measurement of price elasticity of demand – Demand forecasting – Importance – Factors – Methods of Demand Forecasting.

Unit-III

Theory of production and cost analysis: Meaning of production function – Isoquants – Isocosts – Practical Importance – The law of diminishing Marginal Returns – Internal and External Economies of scale.

Cost Analysis – Cost concepts – Fixed and Variable Costs – Cost out put relation ship – Break Even Analysis – Importance – Limitations and Managerial uses of Break Even Analysis.

Unit-IV

Market Structures: Types of Competitions – Features of Perfect Competition – Monopoly – Monopolistic Competition – Price output determination in case of perfect competition and Monopoly.

Unit-V

Capital and its Significance: Types of Capital – Estimation of fixed and working capital requirements – Methods and sources of raising fixed and working capital

Unit-VI

Business Environment: Types of Business Organizations – Formation and evaluation of sole trader – Partnership firm – Partnership Deed – Joint Stock Companies – Features – Private and Public Limited Companies formation – Merits – Demerits – Differences – Prospectus.

Unit-VII

Principles of Accountancy: Introduction to Accountancy – Double Entry System of Book Keeping – Meaning – Scope – Advantages – Journal Entries – Ledger – Subsidiary Books – Preparation of Trial Balance.

Unit-VIII

Preparation of Final Accounts: Trading Account – Profit & Loss Account – Balance Sheet with adjustments – (Final Accounts problems should be given)

Text Books:

1. Varshiney and Maheswari, *Managerial Economics*, Sultan Chand & Co, New Delhi
2. Y.K Bhushan, *Business Organization & Management*, S Chand & Co., New Delhi.
3. S.P Jain and K.L Narang, *Financial Accounting - B.com First Year Andhra Pradesh Universities*, Kalyani Publishers, New Delhi.

Reference Books:

1. Shukla & Grewal, *Advanced Accountancy*, S.Chand & Co., New Delhi
2. M.C Shukla, *Business Organization and Management*, S.Chand & Co., New Delhi.

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit. The student shall answer any **FIVE** questions.

Course Outcomes:

- Students are able to develop the Managerial economics and financial high standard of integrity and objectivity in the profession.

ENGINEERING MATHEMATICS III (EM 3)
(Common to II B.Tech. - I Semester ECE & EEE)

Scheme : 2010 Internal Assessment : 30
Contact Periods : (4L+1T) / Week End Exam Marks : 70
Credits : 5 End Exam Duration : 3 hrs

Course Objectives:

- This course deals with more advanced engineering mathematics topics which provide students with

the relevant mathematical tools required in the analysis of problems in engineering and scientific Professions

Unit-I

Complex Variables: Analytic functions, Cauchy-Riemann equations, Sufficient condition for analyticity, Harmonic function, Method to find the Conjugate function, Milne – Thomson method.

Unit-II

Complex Series and Conformal Mapping: Conformal Mapping (e^z , z^n , sin z, cos z) , Bilinear Transformation , Taylor's and Laurent's series.

Unit-III

Complex Integration: Cauchy's Integral theorem, Cauchy's integral formula, Residue, Residue theorem, Method of finding residues, evaluation of real integrals by contour integration, Integration round the unit circle and in the interval $(-\infty, \infty)$.

Unit-IV

Bessel Functions: Solution of Bessel's equation , Recurrence formula for $J_n(x)$, Generating function, Jacobi series . Orthogonality of Bessel's function.

Unit-V

Legendre Functions: Solution of Legendre's equation, Rodrigues formula, Legendre polynomials, Generating function, recurrence relation formula for $P_n(x)$, Orthogonality of Legendre polynomials.

Unit-VI

Interpolation : Newton's forward and backward interpolation formulae. Gauss forward and backward interpolation formulae. Numerical Differentiation.

Unit-VII

Numerical Methods: Solution of first order Differential equations. Taylor's method, Picard's method, Euler's and modified Euler's methods. Runge-Kutta methods of second and forth order. Milne's Predictor-Corrector method.

Unit-VIII

Statistics: Normal distribution, properties. Correlation Co-efficient, Rank correlation. Lines of regression.

Text Books:

1. B.S. Grewal, *Higher Engineering Mathematics*, Khanna Publishers, New Delhi, 2005.
2. B.V. Ramana, *Engineering Mathematics,* TMH Publishers, New Delhi, 2005.

Reference Books:

1. S.C. Gupta and V.K.Kapoor, *Elements of Mathematical Statistics*, S.Chand Publishers, New Delhi, 1984.
2. Bali Iyengar, *A Text Book of Engineering Mathematics*, Laxmi Publications, New Delhi, 2004.

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit. The student shall answer any **FIVE** questions.

Course Outcomes:

- The students are familiar with different mathematical analysis which includes differential equations, vector-valued functions Etc.

ELECTRONIC DEVICES AND CIRCUITS (EDC)
(Common to II B.Tech. – I Semester ECE & EEE)

Scheme : 2010	Internal Assessment : 30
Contact Periods: 4L / Week	End Exam Marks : 70
Credits : 4	End Exam Duration : 3 hrs

Course Objectives:

- To understand electronic devices, including diodes, bipolar junction transistors and FET
- To understand basic circuits of the electronic devices and Computer aided circuit analysis

Unit-I

Semiconductor Physics : Electrons and holes in intrinsic semiconductors, Extrinsic semiconductors, Donor and acceptor impurities, Charge densities in a semiconductor, Electrical properties of semiconductor materials, Hall effect, Fermi-level, Diffusion, Generation and recombination of charges, Continuity equation, Minority carrier injection, Potential variation within graded semiconductor, Contact potential difference.

Unit-II

Junction Diode: Theory of p-n junction, Forward and reverse biases, Current components in p-n diode, Diode current equation, Volt ampere characteristics, Temperature dependence, Diode resistance and capacitance, Breakdown mechanisms, Breakdown diode (Zener diode), Zener diode as voltage regulator.

Unit-III

Diode Applications: Rectifiers – half-wave and full-wave (Centre tapped and Bridge rectifiers), Ripple factor and voltage regulation, Inductive, Capacitive, LC and CLC filters, Concept of critical inductance and bleeder resistor.

Unit-IV

Bipolar junction Transistor (BJT): BJT fundamentals, Transistor current components, Transistor as an amplifier, Early effect, Transistor configurations (CB, CE & CC) and characteristics, Eber's moll model. Introduction to small signal model, Graphical determination of h parameters.

Unit-V

Junction Field Effect Transistor (JFET): Principle of operation, Characteristics of JFET, FET small signal model, Graphical determination of g_m and r_d, FET as Voltage Variable Resistor (VVR), Advantages of FET over BJT.

Unit-VI

Transistor Biasing: Need for biasing, Operating point, DC and AC load lines, bias stabilization techniques: fixed bias, collector to base bias, self-bias, Stabilization against variations in I_{co}, V_{BE} and β for the self bias circuit, bias compensation techniques, thermal runaway and thermal stability.

Unit-VII

FET Biasing and MOSFETS – Biasing techniques: Fixed bias, Source self-bias, Voltage divider bias, Depletion and enhancement types of MOSFETs.

Unit -VIII

Special semiconductor devices: Principle of operation, Characteristics and applications of- Tunnel diode, Varactor diode, UJT, Photo Diode, Photo transistor, LCD, LED, DIAC and TRIAC.

Text Books:

1. J.Milliman, C.Halkias & Satyabrata Jit, *Electronic Devices and Circuits*, 2nd Edition, TMH, New Delhi, 2007.
2. J. Milliman & C.Halkias, *Integrated Electronics* –TMH, New Delhi.
3. Robert Boylestad & Lowis Nashelsky, *Electronic Devices and Circuit Theory* , 5th Edition , PHI, 1993
4. Allen Mottershed, *Electronics devices and circuits*, PHI

Reference Books:

1. Ben.G.Streetman , *Solid state electronic devices*, PHI
2. David .A. Bell , *Electronic devices and circuits,* 4th Edition, PHI, 1999.
3. Nagrath , *Analog and Digital Circuits*, TMH

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit.
The student shall answer any **FIVE** questions.

Course Outcomes:

- Students are able to understand the operating principles of major electronic devices, circuit models and connection to the physical operation of the device and ability in analysis and design of basic circuits.

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PULSE AND DIGITAL ELECTRONICS (PDE)
(For II B.Tech ECE - I Semester)

Scheme: 2010 | Internal Assessment : 30
Contact Periods: (4L+1T) / Week | End Exam Marks : 70
Credits: 5 | End Exam Duration : 3 hrs

Course Objectives:

- To provide the fundamentals of linear and nonlinear wave shaping and multivibrators.
- To provide the students with an introduction to the fundamentals of Number systems, logic gates, Combinational and sequential circuits

Unit-I

Linear Wave Shaping: High pass, Low pass RC circuits, Their response for sinusoidal, Step, Pulse, Square and ramp inputs, RC network as differentiator and integrator.

Unit-II

Non Linear Wave Shaping: Diode clippers, Clipping at two independent levels, Transfer characteristics of clippers, Clamping operation, Clamping circuits using diode with different inputs, Clamping circuit theorem.

Unit-III

Switching Characteristics of Diode and Transistor: Diode as a switch, Piecewise linear diode characteristics, Transistor as a switch, Saturation parameters of Transistor and their variation with temperature, Transistor-switching times, Design of transistor switch**.**

Unit-IV

Multivibrators: Design and Analysis of Bistable, Monostable, Astable Multivibrators and Schmitt trigger using transistors.

Unit-V

Number Systems: Binary, Octal, Decimal, Hexadecimal systems, Conversion of number systems, Weighted and non-weighted codes, Digital Data Representation: Fixed - Signed magnitude, 1's complement, 2's complement, Floating point – Biased exponent, Binary arithmetic, Hamming code, Error detection and correction.

Unit-VI

Logic Gates and Simplification of Boolean Expressions: OR, AND, NOT, NAND, NOR, EX-OR and EX-NOR gates, Boolean theorems, Switching functions: types, Sum of products, Product of sum, Canonical forms, Minimization of Boolean functions using K-maps and tabulation methods.

Unit-VII

Combinational Circuits: Binary adders and Subtractors using signed magnitude, 1's complement, 2's complement, Carry look-ahead adders (fast adders), BCD adders and Subtractors, Decoders, Encoders, multiplexers, De-multiplexers, Parity generator and checker, Code conversion circuits, Magnitude comparator.

Unit-VIII

Sequential Circuits : Finite state model of sequential circuits, Flip-flops, shift registers, Asynchronous and Synchronous counters, Ring and Johnson counters, Design of non-binary counters, Synthesis of synchronous sequential circuits, Melay and Moore machines, Minimization of states.

Text Books:

1. Milliman and Taub, *Pulse, Digital and Switching Waveforms*, McGraw-Hill.
2. M. Moris Mano, Charles R.Kime, *Digital Logic and Computer Design Fundamentals*, 2nd Edition, Pearson Ed.
3. Zvi Kohavi, *Switching and Finite Automata Theory*, TMH.
4. R.P.Jain, *Modern Digital Electronics*, 3rd Edition, TMH.

Reference Books:

1. David .A. Bell, *Solid State Pulse Circuits,* 4th Edition, PHI.
2. Wakerly, *Digital Design- Principles and Practices*, 4th Edition, PHI.

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit. The student shall answer any **FIVE** questions.

Course Outcomes:

- Students are able to examine the switching operations of transistor, digital circuit building blocks (multivibrators), passive and active wave shaping.
- Competently use an oscilloscope to examine digital signals, build simple power supplies, and demonstrate the simple digital gates and operation of flip flop.

CIRCUIT THEORY (CT)
(For II B.Tech ECE - I Semester)

Scheme : 2010
Contact Periods: (4L+1T) / Week
Credits : 5

Internal Assessment : 30
End Exam Marks : 70
End Exam Duration : 3 hrs

Course Objectives:

- This course introduces basic circuit principles, transient response and network topologies.
- Also introduces the different network theorems and frequency response of resonance circuits.

Unit-I

Circuit Elements: Resistance, Inductance, Capacitance, Specifications of R,L,C and their V-I characteristics, Independent and dependent sources, Response for various types of excitations – step, ramp and parabolic signals, Power and energy in R-L-C components.

Unit-II

Network Analysis: Kirchoff's laws-network reduction Techniques-series, parallel, series parallel, Y to Δ and Δ to Y transformations, Nodal analysis, mesh analysis, super node and super mesh for D.C excitations.

Unit-III

Resonance: Series RL, RC and RLC and parallel circuits – frequency response, Resonance in series and parallel circuits – bandwidth and Q factor.

Unit-IV

Magnetic Circuits: Concept of mutual inductance in coupled circuits- coefficient of coupling – dot convention – composite magnetic circuit analysis.

Unit-V

Network Topology: Concept of graph and tree, Incident matrix , tie set and cut set schedules.

Unit-VI

Network Theorems-I: Thevenin's, Norton's, Maximum power transfer theorems for D.C and sinusoidal excitations.

Unit-VII

Network Theorems-II: Tellegen's, Superposition, Reciprocity and compensation theorems for D.C and sinusoidal excitations.

Unit-VIII

Transient Analysis: Transient response of RL, RC and RLC circuits for DC and sinusoidal excitations using Laplace transform method.

Text Books:

1. William Hayt & Kemmerly, *Engg. Circuit Analysis*, 6th Edition, TMH, 2006
2. Joseph A Edminister, *Theory and problems of Electric circuits*, 4th Edition, TMH, 2004
3. D. Roy Choudary, Networks and Systems, New Age International, 2007.

4. Van Valkenburg, *Network analysis*, 3rd Edition, PHI,2005

Reference Books:

1. A.Sudhakar and S.P.Shyam Mohan, *Circuits and Networks*, 2nd Edition, TMH, 2002
2. Smarajit Ghosh, Network Theory, PHI, 2005.

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit. The student shall answer any **FIVE** questions.

Course Outcomes:

- Students can learn basic principles of circuit theory and are able to design circuits

ELECTROMAGNETICS (EMG)
(For II B.Tech. ECE – I Semester)

Scheme : 2010
Contact Periods: (4L+1T) / Week
Credits : 5

Internal Assessment : 30
End Exam Marks : 70
End Exam Duration : 3 hrs

Course Objectives:

- To develop and understand the fundamental concepts of electromagnetic fields with an emphasis on wave propagation.
- The main objective of the course is to get students familiar with the typical problems and constraints that arise when designing and developing Electromagnetics

Unit-I

Co-ordinate Systems and Transformations: Vector algebra, Co-ordinate systems, Cartesian, cylindrical and spherical, Vector field, Transformation of vector functions from one co-ordinate system to other.

Unit-II

Electrostatic Fields: Coulomb's law, Electric field intensity, Field due to different charge distributions, Line charge, Sheet charge and volume charge distributions. Electric flux and Flux density, Gauss's law and its application.

Unit-III

Energy and Potential: Divergence and its physical interpretation, Divergence theorem. Maxwell's first equation in integral and point forms. Energy expended in moving a point charge in an electric field, Line integral, Potential difference and potential, Potential field of a point charge and system of charges, Potential gradient, Dipole, Energy density in the electrostatic field.

Unit-IV

Conductors, Dielectrics and Capacitances: Current and current density, Continuity of current, Metallic conductors, Method of images, nature of dielectric materials, Boundary conditions for perfect dielectrics and conductors, Capacitance-examples, Poisson's and Laplace equations-examples.

Unit-V

Magneto static Fields: Biot-Savart's law, Ampere's circuital law, Curl, Stokes theorem, Magnetic flux and magnetic flux density, Scalar and vector magnetic potentials,

Unit-VI

Force on a moving charge, Differential current element and force between two differential current elements, force and torque on closed circuit, Magnetization and permeability, Magnetic boundary conditions, Energy in a magnetic field.

Unit-VII

Time Varying Fields & Maxwell's Equations: Faraday's law, Maxwell's equations, Displacement current.

Unit-VIII

Uniform Plane Wave: wave motion in free space, perfect, Lossy dielectrics and good conductors. Poynting theorem, polarization, reflection of plane waves- normal and oblique incidence (perpendicular and parallel polarizations)

Text Books:

1. Hayt.W.H, *Engineering Electromagentics*, 7th Edition, TMH.
2. Sadiku, *Engineering Electromagnetics*, 3rd Edition, Oxford University Press.
3. G.S.N.Raju, *Electromagnetic Field Theory and Transmission Lines*, 1st Edition, Pearson Ed.

Reference Books:

1. Jordan and Balmain, *Electromagnetic Waves and Radiating Systems*, 2nd edition, Pearson Ed.
2. John.D.Kraus, *Electromagnetics*, 6th Edition, Mc Graw-Hill.
3. Nanapeneni Narayana Rao, *Elements of Engg. Electromagnetics*, 6th Edition, Pearson Ed.

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit.
The student shall answer any **FIVE** questions.

Course Outcomes:

- Students can learn electromagnetic fields and have a solid foundation based on the laws of Electromagnetics.

SOFT SKILLS (SS)
(Common for all branches of II B.Tech - I Semester)

Scheme: 2010 Internal Assessment : 100
Contact Periods: (1L+2T) / Week
Credits: 2

Course Objectives:

- Improves the effective communication skills (spoken and Written)
- Develop effective presentation skills.

Self Awareness : Importance of Self Awareness – Johari Window in Self Awareness – four quadrants of Johari Window - Open or Arena Quadrant – Blind Spot quadrant – Hidden or Facade Quadrant – Unknown Quadrant.

Goal Setting : Importance of Goal Setting - Difference between Goals and Dreams – Importance of writing Goals – S.M.A.R.T Goals – Intermediate or Short term Goals – Medium Term Goals – Long Term Goals – How to achieve Goals.

Time Management : Importance of Time – what's your style – A few Myths – Prioritize – Procrastination – the thief of time – carving the cock – How to delegate effectively – the art of anticipating – learning to say NO – Plugging time leaks power - Tools for Time Management – Scheduling.

Inter Personal Behavioral Styles: Importance of Interpersonal Skills – Identifying Yourself - Characteristics of Socializer, Relater, Director, Thinker – Identifying others - Communication with others – Adapting yourself to others

Strokes: Importance of Strokes – Art of giving Strokes – your style – conditional and unconditional Strokes – Positive and Negative Strokes – Giving Strokes – Taking Strokes – Asking for Strokes – Refuse to give Strokes.

Assertiveness : Understanding Assertiveness – Three styles Passive, Assertive, Aggressive – Importance of Self Awareness – Self Confidence – Ability to say NO – Assertive Communication – Body Language – Behavior – Benefits of being Assertive

Team Roles : Importance of teams in Organizations – Your style – three different types Cerebral, Action, People – 8 roles Coordinator, Finisher, Innovator, Shaper, Team Worker, Resource Investigator, Organizer, Evaluator - the role of shaper.

Presentation Skills : Importance of Presentation Skills –Knowledge of the Audience - Body Language - the impact of Voice – overcoming stage fear / Nervousness - Stage Etiquettes - Importance of Content – Introduction, Body, Conclusion –Creating an Impact.

Creativity: Importance of creativity – What is creativity – out of the Box thinking - Lateral Thinking – Critical thinking –Blocks in creativity - Being Creative – Tossing Ideas.

Problem Solving and Decision Making: Problem Solving as skill - Out of the Box thinking – Thinking Styles – Steps in Problem Solving - Steps in Decision Making – Types of Decisions.

References Books:

1. Dr. Stephen R. Covey, Simon and Schuster, *The 7 Habits of Highly Effective People,* Pocket Books Publishers, London.
2. Marc Mancini, *Time Management,* TMH, New Delhi.
3. Infosys Campus Connect Portal – http://campusconnect.infosys.com
4. Stephen R. Covey, A.Roger Merrill and Rebecca R. Merrill, *First Things First,* Pocket Books Publishers, London.
5. Norman Vincent Peale , *The Power of Positive Living,* Ballantine Books, New York.
6. Napoleon Hill and W. Clement Stone, *Success Through a Positive Mental Attitude,* Pocket Books Publishers, New York.
7. Stuart R. Levine, CEO & Michael. CROM, *The Leader in You, Dale Carnegie & Associates Inc.* Pocket Books, New York.
8. Shiv Khera , *You Can Win*, MacMillan India Publishers, New Delhi.

Course Outcomes:

- Soft skills provide students with a strong conceptual and practical Framework to build, develop and manage teams.

PULSE AND DIGITAL ELECTRONICS LAB (PDE (P))
(For II B.Tech ECE - I Semester)

Scheme : 2010
Contact Periods: 3P/Week
Credits : 2

Internal Assessment : 30
End Exam Marks : 70
End Exam Duration : 3 hrs

Course Objectives:

- To know how to design the digital circuits and Multivibrators

List of Experiments

1. Integrator and Differentiator
2. Clipper and Clamper
3. Monostable Multivibrator
4. Bistable Multivibrator
5. Astable Multivibrator
6. Schmitt Trigger
7. Universal Gates
8. Half adder and Full Adder
9. Multiplexer & Decoder
10. BCD to Excess-3 Code Converter
11. Parity Generator and Checker.
12. Shift Register and Ring Counter
13. 4 bit Synchronous Counter
14. 4 bit Asynchronous Counter

Course Outcomes:

- Student knows the design and analysis of digital circuits and multivibrators.

ELECTRONIC DEVICES LAB (ED (P))
(For II B.Tech ECE - I Semester)

Scheme : 2010
Contact Periods: 3P/Week
Credits : 2

Internal Assessment : 30
End Exam Marks : 70
End Exam Duration : 3 hrs

Course Objectives:

- To know the different devices characteristics and applications.
- To study the Design and analysis of amplifier circuits

List of Experiments

1. Study of Electronic equipment - CRO, CDS, and FG etc.
2. Semiconductor Diode Characteristics (p-n diode and Zener diode).
3. Half Wave Rectifier with and without filters.
4. Full Wave Rectifier with and without filters.
5. Transistor Characteristics – CE Configuration.
6. Transistor Characteristics – CB Configuration.
7. FET Characteristics.
8. CE Amplifier.
9. CC Amplifier.
10. UJT Relaxation Oscillator.
11. SCR Characteristics.
12. LDR Characteristics.

Course Outcomes:

- Students are able to design and analyze the Characteristics of different devices and amplifier circuits.

FOUR YEAR B.TECH. DEGREE COURSE

Scheme of Instruction and Examination

(Effective from 2010-2011)

II B.Tech (ECE) – II Semester **Scheme : 2010**

S. No	Subject	Abbreviation	Credits	Scheme of Instruction periods/week			Duration of End Exam (Hours)	Scheme of Examination Maximum Marks		
				L	D/T	P		End Exam	Internal Assessment	Total
I	**Theory**									
1.	Signals and Systems	SAS	**4**	**3**	**1**	–	3	70	30	100
2.	Computer Organization	CO	**5**	**4**	**1**	–	3	70	30	100
3.	Networks and Transmission Lines	NTL	**4**	**3**	**1**	–	3	70	30	100
4.	Probability Theory and Stochastic Process	PTSP	**4**	**3**	**1**	–	3	70	30	100
5.	Electrical Technology	ET	**5**	**4**	**1**	–	3	70	30	100
6.	Analog Circuits	AC	**5**	**4**	**1**	-	3	70	30	100
7.	Aptitude and Reasoning Skills	ARS	**2**	**1**	**2**	–	–	–	100	100
II	**Practical**									
8.	Networks and Transmission Lines Lab	NTL(P)	**2**	–	–	**3**	3	70	30	100
9.	Electrical Technology Lab	ET(P)	**2**	–	–	**3**	3	70	30	100
10.	Analog Circuits Lab	AC(P)	**2**	–	–	**3**	3	70	30	100
	Total		**35**	**22**	**8**	**9**		**630**	**370**	**1000**

SIGNALS AND SYSTEMS (SAS)
(For II B.Tech. ECE – II Semester)

Scheme : 2010
Contact Periods: (3L+1T) / Week
Credits : 4

Internal Assessment : 30
End Exam Marks : 70
End Exam Duration : 3 hrs

Course Objectives:

- The objective of the course is to analyze the response of linear, time-invariant dynamic systems to standard input signals
- To Study the different standard signals that can be applied to the various systems for the estimation of their performance.

Unit-I

Introduction: Basic continuous and discrete time signals, Classification of Signals and Systems and their properties, Basic operations on signals, Elementary signals, Singularity functions: Impulse, Step and Ramp fuctions.

Unit-II

Fourier series representation of periodic signals : Analogy between vectors and signals, Orthogonal signal space, Signal approximation using orthogonal functions, Mean square error, Closed or complete set of orthogonal functions, Orthogonality in complex functions. Representation of function by a set of mutually orthogonal functions, Dirichlet's conditions, Trigonometric Fourier series and Exponential Fourier series, Spectrum and its significance, Amplitude and Phase spectra.

Unit-III

Fourier transforms : Fourier transform(FT), Fourier transform of standard signals, properties of Fourier transforms, Fourier transforms involving impulse function, Fourier transform of periodic signals, Hilbert Transform and its properties, Pre-envelope and bandpass signals.

Unit-IV

Signal transmission through LTI systems: Linear time invariant (LTI) system, Transmission of signals through continuous and discrete time LTI systems, Transfer function of a LTI system. Distortion less transmission through LTI system, Causality & stability.

Unit-V

Convolution and correlation of signals : Graphical method of convolution, auto correlation and Cross correlation of functions, properties of correlation function, Energy density spectrum, Parseval's theorem, Power density spectrum, Relation between auto correlation function and energy/power spectral density function, Relation between convolution and correlation, Applications of convolution and correlation.

Unit-VI

Laplace transforms: Laplace transform(LT), Concept of region of convergence (ROC) for laplace transforms, Properties of laplace transforms, Laplace transform of periodic signals. Inverse laplace transform. Laplace transform solution for electric circuits, System impulse response and definition of system transfer function.

Unit-VII

Sampling: Sampling of continuous time signals, Sampling theorem, Reconstruction of signal from its samples, effect of under sampling – Aliasing, Practical aspects of sampling; pulses of finite duration, Flat top sampling.

Unit-VIII

Z–transforms : Z-Transform of Discrete time signal, Region of Convergence(ROC) and its properties, Constraints on ROC for various classes of signals, properties of Z Transforms, System function, Causlity and stability, Inverse Z Transform, Unilateral Z Transform.

Text Books :

1. Simon Haykin, *Communication Systems*, 2nd Edition, Wiley-Eastern.
2. Oppenheim AV and Willisky, *Signals and Systems*, 2nd Edition, Pearson Edition.
3. B.P.Lathi , *Communication Systems* , Wiley Eastern.

References Books:

1. Simon Haykin and Van Veen,Wiley, *Signals & Systems*, 2nd Edition.
2. Simon Haykin, *Signals and Systems*, Wiley-Eastern.
3. Hwei Piao Hsu, Schaum's, *Outline of Theory Problems of Signals and Systems*, McGraw-Hill Professional.

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit.
The student shall answer any **FIVE** questions.

Course Outcomes:

- The student are able to apply various transformation Techniques to estimate the characteristics of systems
- The students are able to estimate the frequency Spectrum of any standard signal.

COMPUTER ORGANIZATION (CO)
(For II B.Tech. ECE - II Semester)

Scheme : 2010 Internal Assessment : 30
Contact Periods : (4L + 1T) / Week End Exam Marks : 70
Credits : 5 End Exam Duration : 3 hrs

Course Objectives:

- The objective of the course is to familiarize students with the basic Knowledge necessary to understand the hardware operation of Digital computers.
- The course present the organization and architecture of input-output, memory, multiprocessing

Unit-I
Register Transfer and Micro-Operations: Register transfer, Bus and Memory transfers, Arithmetic, Logic and Shift micro-operations, Arithmetic logic shift unit.

Unit-II
Basic Computer Organization and Design: Instruction codes, Computer registers, Computer instructions, timing and control, Instruction cycle, Memory reference instructions, Input /output and Interrupt, design of basic computer.

Unit-III
Micro-Programmed Control: Control memory, Address sequencing, Micro-program example, Design of control unit, Micro-program sequencer.

Unit-IV
Central Processing Unit: General register organization, stack organization, Instruction formats, Addressing modes, Data transfer and manipulation, Program control**.**

Unit-V
Computer Arithmetic: Algorithms for fixed point and signed 2's complement binary arithmetic operations, Floating point arithmetic operations.

Unit-VI
Input/Output Organization: Peripheral devices, input/output interface, Asynchronous data transfer, Modes of transfer, Priority interrupt, DMA.

Unit-VII
Memory Organization: Memory hierarchy, Main memory, Auxiliary memory, Associative memory, Cache memory, Virtual memory.

Unit-VIII
Pipeline and Vector Processing: Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC pipeline, Vector processing and Array Processing.

Text Books:

1. M.Morris Mano, *Computer System Architecture*, Pearson Ed.

Reference Books:

1. John P.Hayes, *Computer Architecture and Organization,* McGraw Hill.
2. Hemachar, *Computer Organization*, Mc Graw Hill.
3. K.Hwang & F.A. Briggs, *Computer Architecture and Parallel Processing*, Mc Graw Hill.

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit.
The student shall answer any **FIVE** questions.

Course Outcomes:

- To be familiar with the basic knowledge the designs of digital logic circuits and apply to computer organization.
- Able to know how to organize the required system Configuration to meet the desired performance.
- The students should be able to design simple computer

NETWORKS AND TRANSMISSION LINES (NTL)
(For II B.Tech. ECE - II Semester)

Scheme : 2010
Contact Periods: (3L+1T) / Week
Credits : 4

Internal Assessment : 30
End Exam Marks : 70
End Exam Duration : 3 hrs

Course Objectives:

- To understand the network functions, filters and transmission lines and how to apply the different mathematical techniques to the filters, attenuators, network synthesis and transmission lines.

Unit-I

Two port Networks: Terminals and terminal pairs, Driving point and transfer functions for two port networks- Z, Y, h, g, ABCD parameters, Equivalence of two port networks. Inter connection of two ports, Analysis of reciprocal networks.

Unit-II

Characteristics of Networks: Symmetrical networks, Characteristic impedance and propagation constant. Asymmetrical networks, Image and iterative impedances, Image transfer constant & iterative transfer constant, Properties of L, T and PI sections, Lattice, Bridged -T, Twin –T networks. L -matching networks.

Unit-III

Filters Basics: The Decibel and Neper, Types of Filters, Characteristics of the filter.
Constant K filters: Low pass, High pass, Band pass, Band stop filters design.

Unit-IV

m-derived filters : m-derived low pass, High pass, Band pass, Band stop filters design. Composite filter design, Equalizers, Attenuators.

Unit-V

Transmission lines: Types of transmission lines, Primary constants, Skin effect, Transmission line equations from source and load end, Infinite line, Secondary constants, Velocity of propagation, Group velocity.

Unit-VI

Terminations: Open and short circuited lines, Transmission line as circuit element, Line distortion, Distortion less line, Loaded lines.

Unit-VII

Characteristics: Properties of transmission lines at UHF, Reflection coefficient, Standing waves, Characteristics of half wave, Quarter wave and 1/8 wave lines.

Unit-VIII

Smith Chart: Construction and applications of Smith chart, Transmission line matching. Single and double stub matching.

Text Books:

1. Van Valkunberg, *Network Analysis (Unit-I)*. 3rd Edition, PHI 1974.
2. Umesh Sinha, *Networks and Transmission Lines*, 8th Edition, Satya Prakashan

Publications 2009.

Reference Books:

1. John D Ryder, *Networks Lines and Fields*, 2nd Edition, Prentice Hall 2003.
2. Johnson, *Transmission Lines and Networks*, TMH.
3. V K A Atre, *Network Theory & Filter Design*, New Age International.
4. A.Sudhakar and S.P.Shyam Mohan, *Circuits and Networks*, 3rd Edition, TMH 2007

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit.
The student shall answer any **FIVE** questions.

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Course Outcomes:

- To understand the network functions and synthesis.
- Able to apply different types of filters and attenuators.
- Able to understand the basic idea in designing of transmission lines for systems/industry needs and representation of networks

PROBABILITY THEORY AND STOCHASTIC PROCESSES (PTSP)
(For II B.Tech ECE - II Semester)

Scheme: 2010 | Internal Assessment : 30
Contact Periods : (3L+1T) / Week | End Exam Marks : 70
Credits: 4 | End Exam Duration : 3 hrs

Course Objectives:

- The Objective of this course is to provide the students with knowledge about the random variable, random process
- To model the random processes in the communication system such as receiver performance, interference, thermal noise, and multipath phenomenon.

Unit-I

Probability Theory: Probability and axioms of probability, Total Probability, Baye's Theorem and Bernoulli's trials, Joint Probability and Conditional Probability.

Unit-II

Random Variables: Definition of a Random variable, Classification of Random variables, Distribution and Density functions- Gaussian, Uniform, Exponential, Binomial, Poisson's, Rayleigh, Chi square, Conditional distributions and density functions.

Unit-III

Operations on single random variable: Expectation, Moments, Variance, Skew and Kurtosis, Chebyshev's Inequality, Markov Inequality, Schwartz Inequality, Characteristic functions, Moment generating function, Transformation of random variables.

Unit-IV

Multiple Random Variables: Joint Distribution Function, Properties of Joint Distribution, Marginal Distribution Functions, Conditional Distribution and Density – Point Conditioning, Conditional Distribution and Density – Interval conditioning, Statistical Independence, Sum of Two Random Variables, Sum of Several Random Variables, Central Limit Theorem.

Unit-V

Operations on Multiple Random Variables: Expected Value of a Function of Random Variable, Joint Moments about the Origin, Joint Central Moments, Joint Characteristic Functions, Jointly Gaussian Random Variables, Two Random Variables case, 'N' Random Variable case, Properties, Transformations of Multiple Random Variables, Linear Transformations of Gaussian Random Variables.

Unit-VI

Random Process-Temporal Characteristics: Random Process Concept, Classification of Random Processes, Distribution and Density Functions, Concept of Stationarity and Statistical Independence. First-Order Stationary Processes, Second- Order and Wide-Sense Stationarity, (N^{th}-Order) and Strict-Sense Stationary, Ensemble Averages, Time Averages and Ergodicity. Mean-Ergodic Processes, Correlation-Ergodic Processes, Autocorrelation Function and its Properties, Cross-Correlation Function and its Properties, Covariance Functions.

Unit-VII

Random Process-Spectral Characteristics: Power Spectrum: Properties, Relationship between Power Spectrum and Autocorrelation Function, Cross-Power Density Spectrum, Properties, Relationship between Cross-Power Spectrum and Cross-Correlation Function.

Unit-VIII

Linear Systems with Random inputs: Linear system Fundamentals, Random signal response of linear systems, System evaluation using random noise, spectral characteristics of system response.

Text Books:

1. Peyton Z. Peebles, *Probability Random variables and Random signal principles* 4th Edition, TMH, 2009.
2. Athanasios Papoulis and Unni Krishna Pillai, *Probability, Random variables and stochastic processes*, 4th Edition, PHI,2009.

Reference books:

1. Henry Stark and John W.Woods,*Probability and Random processes with applications to signal processing,* 3rd edition ,Pearson Education,2009.
2. R.P.Singh and S.D. Sapre, *Communication Systems Analog & Digita*l, 2nd edition,TMH -2007.
3. Simon Haykin, *Communication Systems*, 2nd Edition, John Wiley,2009.
4. I.J.Nagrath, S.N.Sharan, R.Ranjan, S.Kumar*, Signals and Systems,*11th Edition, TMH, 2008

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit.
The student shall answer any **FIVE** questions.

Course Outcomes:

- This course provides a foundation in the theory and Applications of probability and stochastic processes.
- Students are able to understand the mathematical techniques relating to random processes which are applicable in the areas of Communications, signal processing, detection & estimation of signals.

ELECTRICAL TECHNOLOGY (ET)
(For II B.Tech ECE - II Semester)

Scheme : 2010 | Internal Assessment : 30
Contact Periods: (4L+1T) / Week | End Exam Marks : 70
Credits : 5 | End Exam Duration : 3 hrs

Course Objectives:

- To know the designing and working principles of D.C generators ,D.C motors, poly phase induction motors and Transformers
- Providing knowledge about Alternators , synchronous motors and single phase induction motors

Unit-I

D.C.Generators: Constructional features-single lap and wave windings-EMF equation-methods of excitation- characteristics of shunt, series and compound generators.

Unit-II

D.C. Motors : Principle of operation —torque equation- speed-torque characteristics of shunt, series and compound Motors – Losses and efficiency–testing– Swinburne's test and brake test– Speed control of DC shunt motor- 3 point and 4 point starters.

Unit-III

Transformers: Principle of operation –constructional features-useful and leakage fluxes-EMF equation-leakage reactance-vector diagram-equivalent circuit of single phase transformer – types – Constructional features – Phasor diagram on No Load and Load – Equivalent circuit

Unit- IV

Performance of Transformers: Losses and Efficiency of transformer and Regulation – OC and SC tests – all-day efficiency-parallel operation-auto transformers.

Unit- V

Polyphase Induction Motors: A.C Windings-Pitch factor and Distribution factor- EMF equation - Constructional features -Principle of operation– Slip-Torque characteristics – Equivalent circuit-Circle Diagram- Losses and Efficiency -.Methods of Speed control-Star-delta and rotor rheostat starters-applications.

Unit-VI

Alternators: Constructional features – salient pole and turbo alternators-concept of synchronous reactance-vector diagram- regulation –determination by Synchronous Impedance Method – synchronizing of alternators to infinite bus bar.

Unit-VII

Synchronous Motors: Principle of operation-V and Ë curves, hunting and its suppression -applications.

Unit- VIII

Single Phase Induction Motors: Construction- Characteristics –starting split phase and shaded pole methods-single phase series motor.

Text Books:

1. M.S Naidu and S. Kamakshaiah, *Introduction to Electrical Engineering*, TMH Publications.

2. T.K. Nagasarkar and M.S.Sukhija, *Basic Electrical Engineering*, Oxford University Press, 2005

Reference Books:

1. V.K Mehta, *Principles of Electrical Engineering,* S.Chand Publications.
2. I.J. Nagarath amd D.P Kothari, *Theory and Problems of basic electrical engineering*, PHI Publications
3. David V. Kerns, JR. J. David Irwin, *Essentials of Electrical and Computer Engineering*

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit.
The student shall answer any **FIVE** questions.

Course Outcomes:

- Able to get clear idea about basic principles and design of D.C generators and D.C motors, single phase induction motors and Transformers.
- Able to get knowledge about Alternators , synchronous motors and poly phase induction motors

ANALOG CIRCUITS (AC)
(Common to II B.Tech. – II Semester ECE & EEE)

Scheme: 2010
Contact Periods: (4L+1T) / Week
Credits : 5

Internal Assessment : 30
End Exam Marks : 70
End Exam Duration : 3 hrs

Course Objectives:

- To provide knowledge about single stage amplifiers, multi-stage amplifiers, feed back amplifiers, large signal amplifiers, differential ,tuned amplifiers and FET amplifiers and their analysis
- To provide knowledge about working and design of oscillators
- Different transistor models at high frequencies

Unit-I

Single Stage Amplifiers : Transistor as an amplifier, Transistor Low frequency hybrid Model, Analysis of a transistor amplifier circuit using h-Parameters, Comparison of CB, CC and CE amplifier configurations, Emitter Follower, Linear analysis of transistor amplifier circuits, Miller's Theorem and its Dual.

Unit-II

Multistage Transistor Amplifiers: Types of coupling – RC coupled, Direct coupled, Analysis of two cascaded amplifier stages, Approximate CE, CB and CC models, CE amplifier with emitter resistance, Darlington, Bootstrap and Cascode amplifiers, Frequency response of an amplifier at Low and High frequencies, Bandwidth of cascaded amplifier stages.

Unit-III

Transistor at High Frequencies: Hybrid-π model, Hybrid-π conductances, and capacitances, CE short circuit current gain, Parameters f_β and f_T, Current gain with resistive load, Single stage CE transistor amplifier frequency response, Gain-bandwidth product (GBW).

Unit-IV

FET Amplifiers: FET small signal analysis, Low frequency CS and CD amplifiers, CS and CD amplifiers at high frequencies.

Unit-V

Feedback Amplifiers: Classification of amplifiers, Concept of feedback, Transfer gain with feedback, General characteristics of negative feedback amplifiers- Gain, Bandwidth, Input resistance, Output resistance & Noise. Method of analysis of feedback amplifier, Analysis of feedback (Voltage & Current series, Voltage & Current shunt) amplifiers.

Unit-VI

Oscillators: Barkhausen criterion, RC Phase shift oscillator using FET & BJT, General form of LC oscillator circuit, Hartley and Colpitts oscillators, Wien-bridge oscillator and Crystal oscillator its significance.

Unit-VII

Large Signal Amplifiers: Classes of operation, Class A amplifiers (Series-fed, Transformer coupled, Push pull), Class B amplifiers (Push pull, Complementary-symmetry), Crossover distortion and Class AB operation, Class C amplifiers and efficiency.

Unit-VIII

Differential Amplifiers: Ideal differential amplifier, CMRR, Emitter-coupled differential amplifier, Differential amplifier supplied with constant current, Practical considerations, Transfer characteristics of differential amplifiers.

Tuned Amplifiers: Need of tuned amplifiers, Analysis of single stage capacitive coupled tuned amplifier.

Textbooks:

1. Millman and Halkias, *Integrated Electronics*, 2nd Edition, TMH 2010.
2. Allen Mottershed, *Electronic Devices and Circuits*, 28th Edition, PHI 2006.
3. G. K. Mittal, *Electronic Devices and Circuits*, 23rd Edition, Khanna pub. 2006.

Reference books:

1. Bogart Theodore, *Electronic Devices and Circuits*, 6th Edition, PE 2008.
2. Millman and Grabel, *Microelectronic*, 2nd Edition, TMH 2003.
3. Henry Zanger, *Semiconductor Devices and Circuits,* Johnwiley 1984.

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit.
The student shall answer any **FIVE** questions.

Course Outcomes:

- Able to know about the design and analysis of single stage amplifiers, multi-stage amplifiers, feed back amplifiers, large signal amplifiers, differential ,tuned amplifiers and FET amplifiers and oscillators
- Analysis of bipolar transistor models at high frequencies using ∏-models

APTITUDE AND REASONING SKILLS (ARS)
(Common for all branches of II B.Tech - II Semester)

Scheme: 2010 Internal Assessment : 100
Contact Periods: (1L+2T) / Week
Credits: 2

Course Objectives:

- To provide basic knowledge about number systems and all quantitative aspects
- To give the knowledge in Reasoning concepts by including Puzzle salvations, Brain teasers and general mental ability

Quantitative Aptitude

- Number Systems, Averages, Problems on ages, Allegations, Percentages, Profit and Loss, Simple interest and Compound Interest, Ratio and Proportions and Variation, Time and Work, Time and Distance, Mensuration, Functions, Set Theory, Permutation and Combinations, Probability, Progressions, Inequalities, Coordinate Geometry, quadratic Equations, Logarithms

- HCF and LCM, Decimal Fractions, Simplification, Square Roots and Cube Roots, Surds and Indices, Pipes and Systems, Area, Volume and Surface Areas, Races and Games, Calendar, Clocks, Stocks and Shares, True Discount, Banker's Discounts

- Data Interpretation – Tabulation – Bar Graphs – Pie Charts – Line Graphs.

Reasoning

Directions, Blood Relations, Problems on cubes, Series and sequences, odd man out, Coding and decoding, Data Sufficiency, logical deductions, Arrangements and Combinations, Groups and Teams, General Mental Ability, Puzzles to puzzle you, More Puzzles, Brain Teasers, Puzzles and Teasers.

References Books:

1. Arun Sharma, *How to Prepare for Quantitative Aptitude*, TMH Publishers, New Delhi.
2. R.S. Aggarwal, *Quantitative Aptitude,* S.Chand Publishers, New Delhi.
3. Sharon Weiner-Green, *Ira K.Wolf, Barron's GRE,* Galgotia Publications, New Delhi.
4. R.S Aggarwal , *Verbal and Non-Verbal Reasoning,* S.Chand Publishers, New Delhi.
5. Shakuntala Devi, *Puzzles to Puzzle You,* Orient Paper Backs Publishers, New Delhi.
6. Shakuntala Devi , *More Puzzles,* Orient Paper Backs Publishers, New Delhi.
7. Ravi Narula , *Brain Teasers,* Jaico Publishing House, New Delhi.
8. George J Summers, *Puzzles and Teasers,* Jaico Publishing House, Mumbai.

Course Outcomes:

- Able to acquire knowledge in all quantitative aspects
- Able to solve all types of puzzles and reasoning problems

NETWORKS AND TRANSMISSION LINES LAB (NTL(P))
(For II B.Tech ECE - II Semester)

Scheme : 2010
Contact Periods: 3P/Week
Credits : 2

Internal Assessment : 30
End Exam Marks : 70
End Exam Duration : 3 hrs

Course Objectives:

- Study and design of different filters such as LPF,HPF,BPF ,BRF etc
- Simulation of Electronic Circuits using Tinapro Software

List of Experiments

1. Constant K low pass and High Pass Filters.
2. m- derived Low and High Pass Filters.
3. Band Pass Filter.
4. Band Stop Filter.
5. Iterative Impedance and Image Impedance.
6. Transmission Lines & ABCD Parameters.
7. Y & Z Parameters.
8. Attenuators.
9. Equalizers.

Simulation Using TINA Pro software:

1. Clippers and Clampers.
2. Astable Multivibrator.
3. Schmitt Trigger.
4. Two Stage Amplifier.
5. Wein Bridge Oscillator.

Course Outcomes:

- Understand the different filter charactistics.
- How to simulate the given circuits using Tina pro software.

ELECTRICAL TECHNOLOGY LAB (ET (P))
(For II B.Tech ECE - II Semester)

Scheme : 2010
Contact Periods: 3P/Week
Credits : 2

Internal Assessment : 30
End Exam Marks : 70
End Exam Duration : 3 hrs

Course Objectives:

- Verification of KVL,KCL
- Verification of network theorems
- Load tests and break tests on generator and motors

List of Experiments

1. Load test on DC Compound Generator.
2. Swinburne's Test.
3. Brake Test on Three Phase Squirrel cage Induction Motor.
4. Regulation of Alternator.
5. Load Test on Single Phase Transformer.
6. OC and SC test on Single Phase Transformer.
7. Brake Test on DC Shunt Motor.
8. Determination of self-inductance, Mutual inductance and coefficient of coupling.
9. KCL and KVL.
10. Thevenin's Theorem.
11. Norton's Theorem.
12. Superposition Theorem.

Course Outcomes:

- Able to prove network theorems.
- Able to study the load regulation characteristics of generators and Motors
- Able to study about the regulation characteristics of 1-phase transformer and Alternators

ANALOG CIRCUITS LAB (AC(P))

(For II B.Tech ECE - II Semester)

Scheme : 2010
Contact Periods: 3P/Week
Credits : 2

Internal Assessment : 30
End Exam Marks : 70
End Exam Duration : 3 hrs

Course Objectives:

- Working of different feedback amplifiers with frequency responses.
- Design of differential & tuned amplifiers.

List of Experiments

1. Two Stage RC Coupled Amplifier
2. Bootstrap Amplifier
3. Darlington Amplifier
4. FET Amplifier
5. Cascode Amplifier
6. Voltage Series Feedback Amplifier
7. Voltage Shunt Feedback Amplifier
8. Current Series Feedback Amplifier
9. Current Shunt Feedback Amplifier
10. Push Pull Amplifier
11. Class C Amplifier.
12. Single Tuned Amplifier.
13. Differential Amplifier.
14. RC Phase Shift Oscillator

Course Outcomes:

- Able to design different feedback amplifiers.
- Able to design single tuned amplifiers.

FOUR YEAR B.TECH. DEGREE COURSE

Scheme of Instruction and Examination
(Effective from 2010-2011)

III B.Tech (ECE) – I Semester
Scheme : 2010

S. No	Subject	Abbreviation	Credits	Scheme of Instruction periods/week			Duration of End Exam (Hours)	Scheme of Examination Maximum Marks		
				L	D/T	P		End Exam	Internal Assessment	Total
I	**Theory**									
1.	Digital Signal Processing	DSP	**5**	**4**	**1**	–	3	70	30	100
2.	Analog Communication	ACM	**5**	**4**	**1**	–	3	70	30	100
3.	Microprocessors Theory	MPT	**5**	**4**	**1**	–	3	70	30	100
4.	Linear Control Systems	LCS	**5**	**4**	**1**	–	3	70	30	100
5.	Antenna and Wave Propagation	AWP	**5**	**4**	**1**	–	3	70	30	100
6.	Electronic Measurements and Instrumentation	EMI	**4**	**3**	**1**	–	3	70	30	100
II	**Practical**									
7.	Microprocessors Lab	MP(P)	**2**	–	–	**3**	3	70	30	100
8.	DSP Lab	DSP(P)	**2**	–	–	**3**	3	70	30	100
	Total		**33**	**23**	**6**	**6**		**560**	**240**	**800**

DIGITAL SIGNAL PROCESSING (DSP)
(For III B.Tech. ECE - I Semester)

Scheme: 2010 | Internal Assessment : 30
Contact Periods: (4L+1T) / Week | End Exam Marks : 70
Credits : 5 | End Exam Duration : 3 hrs

Course Objectives:

- To become familiar with Digital Filter design and transform domain Processing.
- To understand the concepts of representation, transformation of the signals and the information they contain.

Unit-I

Introduction: DSP advantages, limitations and applications, Discrete time sequences and systems, Linear shift invariant systems, Stability, and causality, Linear constant coefficient difference equations, Frequency domain representation of discrete time signals and systems.

Unit-II

Discrete Fourier Series and Transform: Discrete Fourier series, Properties of discrete Fourier series, DFS representation of periodic sequences, Discrete time Fourier transform (DTFT), Discrete Fourier transform (DFT), Properties of DFT, Computation of DFT, Circular Convolution, Overlap add method, Over lap save method.

Unit-III

Fast Fourier Transforms: Fast Fourier transforms (FFT) - Radix-2 decimation in time and decimation in frequency FFT Algorithms, Inverse FFT, comparison of DFT&FFT computations.

Unit-IV

Realization of Digital Filters: Review of Z-transforms, Applications of Z – transforms, Solution of difference equations of digital filters, Basic structures of IIR systems-Direct form I&II, Cascade, Parallel.

Unit-V

IIR digital filters: Analog filter approximations – Butter worth and Chebyshev, Design of IIR Digital filters from analog filters, Mapping of differentials, Impulse invariance, Bilinear transformation technique.

Unit-VI

FIR Digital Filters: Characteristics of FIR Digital Filters, Frequency response, Design of FIR Digital Filters using Fourier series method, Windowing Techniques, Frequency Sampling technique, Comparison of IIR & FIR filters, Realization of FIR filters.

Unit-VII

Multirate Digital Signal Processing: Decimation, Interpolation, Sampling rate conversion, Implementation of sampling rate conversion.

Unit-VIII

Introduction to DSP Processors: Introduction to programmable DSPs: Multiplier and Accumulator (MAC), Modified Bus Structures and Memory Access schemes in DSPs Multiple access memory, VLIW Architecture, Pipelining, Special addressing modes, On-Chip Peripherals.

TMS320C67XX Processor: Features of TMS320C67XX processors, Internal architecture, addressing modes, External memory access, Peripherals.

Text Books:

1. John G. Proakis, Dimitris G.Manolakis *Digital Signal Processing*, *Principles, Algorithms, and Applications*, Pearson Education, 2007.
2. A.V.Oppenheim and R.W. Schaffer, *Discrete Time Signal Processing*, PHI.
3. Emmanuel C.Ifearchar, Barrie W.Jervis, *DSP A Practical Approach*, Pearson Ed.
4. B.Venkataramani, M. Bhaskar, *Digital Signal Processors – Architecture, Programming and Applications*, TATA McGraw Hill, 2002.

Reference Books:

1. Andreas Antoniou, *Digital Signal Processing*, TATA McGraw Hill, 2006
2. MH Hayes, Schaum's, *Outlines Digital Signal Processing,* TATA Mc-Graw Hill, 2007.
3. P.Ramesh Babu, *Digital Signal Processing*, Scitech Publications.

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit.
The student shall answer any **FIVE** questions.

Course Outcomes:

Ability to analyze the effects of quantization and aliasing in a real time DSP system

- Ability to apply various filter design techniques and FFT computations for a real time system.

ANALOG COMMUNICATIONS (ACM)
(For III B.Tech. ECE - I Semester)

Scheme: 2010
Contact Periods: (4L+1T) / Week
Credits : 5

Internal Assessment : 30
End Exam Marks : 70
End Exam Duration : 3 hrs

Course Objectives:

- To analyze various transmitter and receiver functions and circuits.
- To analyze different modulation and demodulation techniques.

Unit-I

Amplitude Modulation: Block diagram of general communication system, Need for Modulation, Generation and demodulation of AM, Band width, Power relations, Generation and demodulation of DSB-SC.

Unit-II

Single Side Band Modulation(SSB): SSB modulation, Coherent detection, Vestigial side band modulation, Frequency division multiplexing(FDM), Comparison of various AM systems-problems.

Unit-III

Angle Modulation: Frequency Modulation and Phase Modulation, FM narrow band and wide band techniques, Band width, Generation of FM , Direct and indirect FM, Demodulation of FM- frequency and phase discrimination methods.

Unit-IV

Pulse Modulation Schemes: Review of sampling theorem, Generation and demodulation of PAM, PWM, and PPM, Time division multiplexing (TDM).

Unit-V

Pulse Code Modulation(PCM): PCM, Companding, Band width, Noise in PCM systems, Transmitters and receivers of Differential Pulse code modulation(DPCM), Delta Modulation(DM), Adaptive Delta modulation(ADM).

Unit-VI

Noise: Various types of noise, Equivalent noise band width, Noise figure, Noise temperature, Noise figure of cascaded stage amplifiers.

Unit-VII

Noise in AM and FM: Noise in AM and FM, Figure of merit of AM, DSBSC, SSB, and FM, Threshold effect, Pre-emphasis and De-emphasis circuits.

Unit-VIII

Information Theory: Information, Entropy, Rate of information and information capacity, Shannon–Hartley law and its significance, Shannon–Fano and Huffman coding techniques, Channel capacity for Binary symmetric channel, Binary erase channel.

Text Books:

1. S.S.Haykin, *Communication Systems*, 2nd Edition, Wiley Eastern.
2. Taub and schilling, *Principles of Communication Systems*, TMH.

Reference Books:

1. Kennedy, *Electronic Communication Systems*, TMH.
2. B.P.Lathi, *Modern Digital and Analog Communication Systems*, BPB.
3. A.B.Carlson, *Communication Systems*, Mc.Graw-Hill.

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit.
The student shall answer any **FIVE** questions.

Course Outcomes:

- Ability to understand the tradeoffs in terms of bandwidth, power between analog and digital communication systems.
- To analyze the effects of noise on system performance and methods to reduce it.

MICROPROCESSORS THEORY (MPT)
(For III B.Tech. ECE - I Semester)

Scheme: 2010
Contact Periods: (4L+1T) / Week
Credits : 5

Internal Assessment : 30
End Exam Marks : 70
End Exam Duration : 3 hrs

Course Objectives:

- To become familiar with 8085 & 8086 Microprocessor Architecture, Instructions, Operating Modes, Programming.
- To use 8086 microprocessor for various applications.
- To study various peripherals for microprocessor based systems.

Unit-I

Introduction of 8 bit Microprocessor – 8085: Architecture and Organization of 8085 Microprocessor, Instruction set, Addressing modes, Instruction cycle, Fetch and Execute cycles.

Unit-II

Introduction of 16 bit Microprocessor – 8086: 8086 CPU architecture, Segmented memory, Addressing modes.

Unit-III

8086 Instruction set: 8086 instruction set, 8086 Maximum mode and Minimum mode.

Unit-IV

Introduction to Assembly Language Programming: Assembler directives, Assembly language programming using MASM / TASM.

Unit-V

Programming on 8086: Simple programs on Arithmetic Sorting, Searching, Code conversions, String manipulations etc. Procedures & Macros. Using DOS Int 21h Calls.

Unit- VI

Memory Interfacing: Read/ Write timing, SRAM and ROM Interface requirements, Interfacing of Static memory and Dynamic memory.

Unit-VII

I/O Interfacing: 8255(Programmable Peripheral Interface), 8255 applications – Key board interfacing, Display interfacing, Stepper Motor interfacing, Printer interfacing, DAC interfacing, Waveform generation and ADC interfacing.

Unit-VIII

Peripheral Interfacing: 8254(Programmable Timer / Counter), 8251(USART), 8257 (DMA Controller), 8259 (Programmable Interrupt Controller). Co-processor 8087 – architecture & interfacing.

Text Books:

1. Gaonkar Ramesh, *Microprocessors Architecture, Programming & Applications with 8085/8080A*, 5th Edition, Penram International publication Ltd, 2010.
2. Douglas V.Hall, *Microprocessors and Interfacing Programming and Hardware*,2nd Edition, Tata McGraw Hill Education Private Ltd, 2006.

3. A K Ray, K M Bhurchandi, *Advanced Microprocessors and Peripherals*, 2nd Edition, Tata McGraw Hill Education Private Ltd, 2010.

Reference Books:

1. John Uffenbeck, *The 8086/8088 Family: Design, Programming, and Interfacing*, 3rd Edition, Pearson Ed, 2006.
2. Walter A.Triebel, Avtar Singh, *The 8088 and 8086 Microprocessors*,4th Edition, Pearson Ed, 2009.
3. Barry B. Brey, *The Intel Microprocessors-Architecture,Programming and Interfacing*, 8th Edition, Princeton Hall India,2009.

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit.
The student shall answer any **FIVE** questions.

Course Outcomes:

- The students get expertise with programming with 8085 &8086 microprocessors and find a scope to innovate various microprocessor based systems.

LINEAR CONTROL SYSTEMS (LCS)
(Common to III B.Tech. - I Semester ECE & EEE)

Scheme :2010
Contact Periods : (4L +1T)/week
Credits : 5

Internal assessment : 30
End Exam Marks : 70
End Exam duration : 3 hrs

Course Objectives:

- To study the feedback characteristics of Control systems.
- To study concept of Stability.
- To understand State variable analysis.

Unit-I

Equations and Models of Linear Systems: Basic elements and types of servomechanism, Open-loop and closed-loop systems, Control system components, Servomotor, Tachometer, Synchros, position control systems, Equations of electrical and mechanical systems, Transfer functions and impulse response.

Unit-II

Block Diagrams: Block diagram representation and manipulation, Signal flow graphs-mason's gain formula to determine overall system gain.

Feedback Characteristics of Control Systems: Feedback and non-feedback systems, Effects of feedback, Regenerative feedback.

Unit-III

Time Response: Types of input, Transient response of second order system for step input, Time-response specifications, Steady state error and error constants, Proportional, Derivative and integral controls.

Unit-IV

Concept of Stability: Stability of systems-Routh Hurwitz criterion, Relative stability.

Root Locus: Definition of Root Locus, Construction Procedure, Properties of typical systems analyzed by root locus techniques.

Unit-V

Frequency Response: Co-relation between time and frequency response, frequency domain specifications, resonant peak (Mp) and resonant frequency(Wp) for a second order system, Relative stability-gain margin(GM) and phase margin (PM),

Unit-VI

Frequency Plots: Bode plots, , Polar plots, Nyquist criterion for open loop stable system, M and N circles.

Unit-VII

Compensation (Without Design): The necessity of compensation, Series and parallel compensation. Realization of basic lead, Lag and lead-Lag compensators.

Unit-VIII

State Variable Analysis: Introduction, Concepts of state, State variables, State transition matrix, and state model, State model of linear systems, State-space representation using phase variable and physical variables, Solution of state equations. Concept of Controllability and Obserability.

Text Books:

1. Nagrath and Gopal, *Control systems Engineering*, New Age International Publications, 2003
2. B.C.Kuo, *Automatic Control Systems*, Oxford, 2003.
3. K. Ogata , *Modern control Engineering*, Pearson, 2003
4. Naresh - K.Sinha, *Control Systems*, New Age International Publishers, 1998.
5. B.S.Manke, *Linear Control Systems*, 1996

Reference Books:

1. Madan Gopal, *Control Systems*, TMH, 2003.
2. Dorf, Bishop, *Modern Conrtol systems*, Addison Wesle, 1998.
3. Shaum's out line series, *Feedback control systems,* TMH, 1986
4. R.C.Shukla, *Control Systems*, Dhanpat Rai and Sons.
5. Ashok Kumar, *Control Systems*, TMH

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit. The student shall answer any **FIVE** questions.

Course Outcomes:

- Ability to apply concepts of Stability to Practical systems.
- Students get ability to analyze the concepts of Servomechanism.

ANTENNAS AND WAVE PROPAGATION (AWP)
(For III B.Tech. ECE - I Semester)

Scheme: 2010
Contact Periods: (4L+1T) / Week
Credits : 5

Internal Assessment : 30
End Exam Marks : 70
End Exam Duration : 3 hrs

Course Objectives:

- The student will learn the fundamental principles of transmission line theory related to communications including the propagation of signals on a transmission line and in free space.

Unit-I

Antenna Basics: Introduction, Radiation mechanism, Current distribution on a thin wire antenna. Basic antenna parameters, Radiation patterns, Beam area, Radiation intensity, Beam efficiency, directivity, Gain, Antenna aperture, Effective height.

Unit-II

Electric Dipole and Linear Antennas: Potential functions and the electromagnetic field, Potential functions for sinusoidal oscillations Electric dipoles, Short electric dipole, Fields of a short electric dipole, Radiation resistance of short electric dipole, Assumed current distribution, Half wave dipole, Radiation resistance, Quarter wave monopole.

Unit-III

Array of Point Sources: Point sources and their arrays.
Linear Array: BSA and EFA, Parasitic array, Point source, Power pattern, Examples of power patterns, Field patterns, Array of two isotropic point sources, Pattern multiplication, Linear array of n Isotropic point sources of equal amplitude and spacing (EFA and BSA), Null directions, Binomial array.

Unit-IV

Resonant and Non-Resonant Radiators: Introduction Resonant Antenna and Non Resonant Antenna,Long wire antenna , V –Antenna Inverted V- antenna, Rhombic Antenna Helical Antenna

Unit-V

VHF,UHF and Microwave Antennas: Dipoles with parasitic Elements, Yagi-Uda Array, Folded Dipole Antenna, Reflector Antennas: Parabolic Reflector antenna, Spill over loss, Aperture efficiency, Basic characteristics of Cassegrain Reflector Antenna., Horn Antennas

Unit-VI

MicroStrip Antennas: Basic Characteristics, Feeding Methods, Rectangular, Circular patch quality factor bandwidth efficiency
Introduction to Smart antennas
Measurements: Impedance, Gain- absolute and three antenna methods, Radiation pattern, Directivity.

Unit-VII

Radio Waves Propagation: Electromagnetic or Radio waves, fundamental equation for FRISS free space propagation, Modes of propagation, Structure of atmosphere, Sky wave propagation (neglecting earths magnetic field), Virtual Height, MUF, Skip distance.

Unit-VIII

Space wave propagation - Range of space wave propagation, Effective earth radius, Field strength of space wave propagation, Duct propagation

Text Books:

1. Ronald J. Marhefka, *Antennas for all Applications*, 3rd Edition, Pearson.
2. Jordan and Balmain, *Electromagnetic and Radiating Systems*, 2nd Edition, Pearson,
3. K.D. Prasad**,** *Antennas and Wave Propagation,* Satyaprakashan Pub.

Reference Books:

1**.** Glazier and Lamont, *Transmission and Wave Propagation*, HMSO.
2. Constantine A. Balanis, *Antenna Theory: Analysis and Design*, 3rd Edition, Wiley Publications.

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit.
The student shall answer any **FIVE** questions.

Course Outcomes:

- Understand basic antenna principles and applications.
- Implement antenna analysis procedures with the use of EM modelling tools.

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION (EMI)
(For III B.Tech. ECE - I Semester)

Scheme: 2010 | Internal Assessment : 30
Contact Periods: (3L+1T) / Week | End Exam Marks : 70
Credits : 4 | End Exam Duration : 3 hrs

Course Objectives:

- The presentation of fundamental measurement concepts and measurement methodologies including the description of basic instruments that are the technological implementation of general methodologies.
- Understanding about the transducers and to help the students analyze various signals using CRO.

Unit-I

Measurement and Error: Measurement, Generalized measurement system, Static and dynamic characteristics of Instrumentation system, Calibration, errors and their statistical analysis, PMMC instrument, specifications of an instrument, Electronic voltmeters-AC voltmeters using rectifiers, ammeters and multimeters.

Unit-II

AC bridges: Condition for Bridge Balance, Measurement of Inductance-Maxwell bridge, Measurement of capacitance-Schering bridge. Measurement of Resistance- Kelvin bridge, Wheatstone bridge. Hay's bridge, Wein Bridge, LCR Bridge and Q-meter.

Unit-III

Analog & Digital Instruments: Standard and AF sine & square wave signal generators, Function generators, Wave analyzers, Harmonic distortion analyzer, Spectrum analyzer, Analog Vs Digital instruments, Principle & operation of DVMs-Ramp type, Dual slope type, Successive approximation type, Digital frequency meter.

Unit-IV

CRO: Basic CRO operation, Deflection sensitivity, Cathode ray tube, Time base circuits, Delay line, CRO probes, measurements with CRO, Lissajous Figures, Analog storage CRO, Digital storage CRO, Sampling oscilloscope.

Unit-V

Transducers: Sensors and Transducers, Classification & Selection of transducers, Temperature Sensors, Temperature transducers, Strain gauges, LVDT, Piezo electric transducers. Measurement of physical parameters-force, Humidity, Velocity and Acceleration.

Unit VI

Introduction to Biomedical Instrumentation: Biometrics, Specifications of medical instrumentation system, Components of man-instrument system, physiological systems of body, Bioelectric potentials for ECG and EEG, Bio potential electrodes and leads, Brief introduction to Cardio Vascular System.

Unit VII

DAS: Introduction to DAS, Data Logging, Use of ADC, Sample & Hold circuit, Multiplexers and demultiplexers in DAS.

Unit VIII

Computer controlled test systems: Introduction to testing an audio amplifier, Testing a radio receiver, Instruments used in computer controlled instrumentation, IEEE-488 Electrical interface, Digital control description.

Text Books:

1. W.D.Cooper & A.D.Helfrick, *Modern Electronic Instrumentation and Measurement Techniques*, Pearson Ed,1990.
2. A.K.Sawhney, *A course in Electrical and Electronic Measurements and Instrumentation*, Dhanpat Rai & Sons, Eighteenth Edition, 2007.
3.M.S. Kaksi, Electronic Instrumentation, TMH, 2006

Reference Books:

1. Leslie Cromwell. Fred J. Weibell and Erich A.Pfeiffer*, Biomedical Instrumentation and Measurements, second edition,* PHI,2002.
2. B.C. Nakra and K.K. Chaudhary, *Instrumentation*, Measurement and Analysis, 2nd Edition, TMH,2006.
3. R.S.Khandpur, *Hand Book of Biomedical Instrumentation*, TMH

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit. The student shall answer any **FIVE** questions.

Course Outcomes:

- Understand the various measurement techniques available.
- Understand the Basic working of instruments used for measurement.
- Understand the errors in measurements and their rectification.

MICROPROCESSORS LAB (MP(P))
(For III B.Tech. ECE - I Semester)

Scheme : 2010
Contact Periods: 3P/Week
Credits : 2

Internal Assessment : 30
End Exam Marks : 70
End Exam Duration : 3 hrs

Course Objectives:

- Designing various programs to verify processors operating style.
- Learning interfacing of processor with various Peripherals.

List of Experiments

1. Introduction to TASM and Debug.
   Assembly Language Programs Using 8086 Kits
2. Arithmetic Programs
3. Searching and Sorting
4. Factorial and Fibonacci Series generation

Assembly Language Programs Using TASM and Debug:

5. String Related Programs
6. Procedures
7. Macros
8. Using DOS Int Calls

Interfacing Experiments

9. ADC & DAC Interfacing
10. Stepper Motor and Relay Interfacing
11. Programming 8253
12. Programming 8251

Course Outcomes:

- Usage of Instruction set shall help the students to frame multiple programs, and learn controlling capacity of processor on various peripherals.

DSP LAB (DSP(P))
(For III B.Tech. ECE - I Semester)

Scheme : 2010
Contact Periods: 3P/Week
Credits : 2

Internal Assessment : 30
End Exam Marks : 70
End Exam Duration : 3 hrs

Course Objectives:

- To design new algorithms for the implementation of a digital system.
- To understand the MATLAB simulation of various DSP concepts and filter design.

List of Experiments

MATLAB Programs

1. Linear Convolution
2. Autocorrelation & Cross correlation and verification of Auto correlation Properties.
3. Verification of Sampling Theorem..
4. IIR Filter Design – Butterworth
5. IIR Filter Design – Chebyshev
6. FIR Filter Design – Windowing Method
7. Circular Convolution using DFT- IDFT method

Using DSP Kits:

8. Linear convolution
9. Circular Convolution
10. N-Point DFT
11. IIR Filters
12. FIR Filters

Course Outcomes:

- Ability to design, verify and evaluate a real time DSP system.
- Ability to develop numerous programming tools for design and implementation of filtering algorithms.

FOUR YEAR B.TECH. DEGREE COURSE

Scheme of Instruction and Examination
(Effective from 2010-2011)

III B.Tech (ECE) – II Semester **Scheme : 2010**

S. No	Subject	Abbreviation	Credits	Scheme of Instruction periods/week			Duration of End Exam (Hours)	Scheme of Examination Maximum Marks		
				L	D/T	P		End Exam	Internal Assessment	Total
I	**Theory**									
1.	Digital Design Through VHDL	VHDL	**4**	**3**	**1**	–	3	70	30	100
2.	Digital Communications	DCM	**4**	**3**	**1**	–	3	70	30	100
3.	Communication Systems	CS	**5**	**5**	**-**	–	3	70	30	100
4.	Microwave Engineering	MWE	**4**	**3**	**1**	–	3	70	30	100
5.	Integrated Circuits and Applications	ICA	**5**	**4**	**1**	–	3	70	30	100
6.	Introduction to Information Systems	IIS	**5**	**4**	**1**	–	–	70	30	100
7.	Open Elective – I		**2**	**2**	–	–	–	–	100	100

II	**Practical**									
8.	Communications Lab	CM(P)	**2**	**–**	**–**	**3**	3	70	30	100
9.	Linear IC Applications Lab	ICA(P)	**2**	**–**	**–**	**3**	3	70	30	100
10.	Introduction to Information Systems Lab	IIS(P)	**2**	**–**	**–**	**3**	3	70	30	100
	Total		**35**	**24**	**5**	**9**		**630**	**370**	**1000**

DIGITAL DESIGN THROUGH VHDL (VHDL)
(For III B.Tech. ECE - II Semester)

Scheme : 2010 | Internal Assessment : 30
Contact Periods : (3L+1T) / Week | End Exam Marks : 70

Credits : 4 | End Exam Duration : 3 hrs

Course Objectives:

- To introduce VHDL and its language elements to design digital systems.
- Make students familiar with design of different combinational and sequential digital circuits.

Unit-I

Introduction to VHDL: History, VHDL terms, Traditional design methods, Traditional schematics, Symbol versus entities, Schematics versus architectures, Component instantiation, Behavioral descriptions, Concurrent signal assignment, Event scheduling, Sequential statements, Architecture selection, Configuration statements.

Unit-II

Basic language elements: Identifiers, Data objects, Data types: Scalar, Complex, Access and file type, Operators.

Unit-III

Dataflow Modeling: Architecture body, Concurrent signal assignment, Delta delay, Multiple drivers, Conditional signal assignment, Block statement, using simple examples.

Unit-IV

Sequential modeling: Entity declaration, Architecture body, Process statement, Variable assignment statement, Concurrent vs Sequential signal assignment statement, Wait statement, If statement, Case statement, Null statement, Loop statement, Exit statement, Next statement, Assertion, Report statement, examples. Multiple Processes. Simple examples.

Unit-V

Structural Modeling: Architecture body, Component declarations, Component instantiation, Simple examples. Generic and configurations: Generics, Configurations, Configuration specification, Declarations, Conversion functions. simple examples.

Unit-VI

Subprograms, Packages and Libraries: Subprograms: Functions, Conversion functions and procedure, Package declaration, Package body, Design file, Libraries. Converting real and integer to time

Unit-VII

Combinational Logic Design: VHDL representations for Multiplexer, De-multiplexer, 4-bit adder, Priority encoder, Decoders, One bit comparator, BCD to 7-segment decoder, 74381 ALU, Combinational multipliers examples.

Unit-VIII

Sequential Logic Design: VHDL representations for Latches and flip-flops, PLD's, Counters, Shift Registers, Synchronous Design and other examples.

Model Simulation: Simulation, writing a test bench, Dumpling results into a text file, Reading vectors from a text file. Modeling a Moore FSM, a Melay FSM.

Text Books:

1. Douglas Perry, *VHDL,* 4th Edition.Tata McGraw-Hill, 2002
2. Stephen Brown, *Fundamentals of Digital Logic with VHDL Design*, TMH, 2009.
3. J.Bhaskar, *VHDL Primer*, Pearson Ed.

Reference Books:

1. Charles H. Roth Jr, *Digital System Design Using VHDL,* PWS Publications, 1998.
2. Alan B. Marcovitz, *Introduction to Logic Design*, 2nd Edition, TMH, 2005.
3. *Cypress Semiconductors Data Book*

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit. The student shall answer any **FIVE** questions.

Course Outcomes:

- The student will be able to design and simulate different digital circuits using VHDL.

DIGITAL COMMUNICATIONS (DCM)
(For III B.Tech. ECE - II Semester)

Scheme : 2010 | Internal Assessment : 30
Contact Periods : (3L+1T) / Week | End Exam Marks : 70

Credits : 4 | End Exam Duration : 3 hrs

Course Objectives:

- Introduce the students, the fundamentals of digital communication systems
- To make students understand the analysis of digital communications system and fundamentals of channel coding

Unit-I

Introduction: Elements of Digital Communication Systems, Sampling theorem, Ideal sampling, Practical sampling, Quantization (uniform & non uniform).

Unit-II

Baseband Data Transmission: Baseband PAM and Duo-binary PAM systems, M-ary signaling schemes, Signal shaping, Eye diagrams, Scrambler & Unscrambler, Synchronization.

Unit-III

Linear Block Codes: Introduction, Matrix description of Linear Block codes, Error detection and error correction capabilities of Linear block codes, Hamming codes, Binary cyclic codes, Algebraic structure, Encoding, Syndrome calculation, BCH Codes.

Unit-IV

Convolution Codes: Introduction, encoding of convolution codes, Time domain approach, Transform domain approach. Graphical approach: State, Tree and Trellis diagram decoding using Viterbi algorithm.

Unit-V

Digital Communication Techniques for Coherent Systems: Optimum receiver, Description of ASK, FSK and PSK Systems (coherent), Description of QPSK, MSK and QAM Schemes, Determination of probability of errors, Probability of error for ASK, FSK and PSK schemes(coherent)

Unit-VI

Digital Communication Techniques for Non Coherent Systems: Description of Non-coherent reception of ASK and FSK Signals, Description of non-coherent reception of PSK signal, Determination of probability of occurrence of error, Probability of error in the received Non-coherent ASK and FSK signals.

Comparison of ASK, FSK and PSK Signaling Schemes in terms of bandwidth, error probability, signaling speed etc.

Unit-VII

Spread Spectrum Modulation: Introduction, Pseudo-noise sequence, DS spread spectrum with coherent binary PSK, Processing gain, FH spread spectrum.

Unit-VIII

Multiple Access Techniques: TDM and FDM systems, TDMA, FDMA & CDMA.

Text Books:

1. K. Sam Shanmugam, *Digital and Analog Communication Systems*, Wiley-India,
2. Simon Haykin, *Digital Communication*, Wiley Eastern United.

Reference Books:

1. Proakis John*, Digital Communications,* McGraw-Hill.
2. Taub and Schilling, *Principles of Communication Systems*, McGraw-Hill.
3. A. Bhattacharya, *Digital Communication*, TMH.
4. S. Rappaport, Wireless Communications, PHI.

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit.
The student shall answer any **FIVE** questions.

Course Outcomes:

- The student will be able to analyze various methods of base band and band pass digital transmission and detection methods
- The student will know how to analyze and allocate performance objectives to components of a digital communications system

COMMUNICATION SYSTEMS (CS)
(For III B.Tech. ECE - II Semester)

Scheme : 2010 | Internal Assessment : 30
Contact Periods : 5L / Week | End Exam Marks : 70

Credits : 5 | End Exam Duration : 3 hrs

Course Objectives:

- To give familiarity with different communication systems like Satellite communications, Spread Spectrum communications, Television and Radar Engineering.

Unit-I

AM, FM Transmitters and Receivers: AM Transmitters (Low level and High level), FM Transmitters (Direct and Indirect methods), TRF Receiver, Super heterodyne receiver.

Unit-II

Receiver parameters: Selectivity, Sensitivity, Fidelity, Choice of IF, Local oscillator, Image frequencies, Tracking errors, AGC circuits (Simple AGC, Delayed AGC).

Unit-III

TV Transmitters and Receivers Monochrome: Basic TV system, Interlaced scanning, Composite Video signal, CCIR-B standards.
TV Cameras:- Image orthicon, Vidicon and Plumbicon.
Monochrome Transmitter and Receiver.

Unit-IV

TV Transmitters and Receivers Color: Luminance signal and chrominance signal, Block diagram of color TV transmitter and Receiver for PAL system.

Unit-V

Introduction to Radar Engineering: The simple form of Radar equation, radar block diagram and operation, Radar frequencies, Applications of radar, Predictions of range performance, Minimum detectable signal, Receiver noise, SNR, Probability of detection and false alarm.

Unit-VI

Types of Radars: Doppler effect, CW and FMCW radar(Block diagram and operation), MTI radar with power amplifier transmitter and power oscillator transmitter, delay line cancellers, Blind speeds.

Unit-VII

Radar Tracking: Tracking with radar, Sequential lobing, Conical scan, Mono pulse amplitude and phase comparison tracking radars.

Unit-VIII

Satellite communications: Orbital satellites, GEO Satellites, Orbital patterns, Look angles, Orbital spacing and frequency allocation, Link model, System parameters, Link equations.

Text Books:

1. Kennedy, *Electronic communication systems*, 4th edition, Tata McGraw-Hill, 2002.
2. A.M.Dhake, *TV Engineering*, Second edition, Tata McGraw-Hill, 1979.

3. Skolnik, *Introduction to Radar Systems*, 2nd and 3rd Editions, Tata McGraw-Hill, 2002.
4. Wayne Tomasi *Advanced Electronic Communications Systems*, Pearson Ed, 2003.

Reference Books:

1. Dennis Roddy and Collen, *Electronic Communications*, Pearson Ed, 1995.
2. Taub and Schilling, *Communication Engineering*, Tata McGraw-Hill, 1986.
3. Kulkarni M, *Microwave and Radar Engineering*, 1st Edition, Umesh pub,1999.

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit.
The student shall answer any **FIVE** questions.

Course Outcomes:

- The students will be able to have a comprehensive understanding of different communication systems.

MICROWAVE ENGINEERING (MWE)
(For III B.Tech. ECE - II Semester)

Scheme : 2010 | Internal Assessment : 30
Contact Periods : (3L+1T) / Week | End Exam Marks : 70

Credits : 4 | End Exam Duration : 3 hrs

Course Objectives:

- To impart Knowledge about various microwave components, microwave junctions, microwave tubes and microwave signal characteristic measurements

Unit-I

Guided Waves and Wave Guides: Microwave frequencies advantages and applications, Waves between parallel conducting planes, TE and TM waves, Rectangular wave guides, Excitation of wave guides.

Unit-II

Rectangular and circular wave guides and resonators: Wave equations rectangular and circular wave guides for TE and TM modes, Cutoff frequency and wave length, Group and phase velocity, Wave impedance, Guide attenuation, Rectangular and cylindrical resonators, Q of the resonators.

Unit-III

Passive Microwave Devices-I: Terminations, Attenuators, Phase changers. Introduction to scattering parameters and its properties, Derivation of S- matrix for E-plane, H-plane, Magic tee.

Unit-IV

Passive Microwave Devices-II: Derivation of S- matrix for directional couplers, Hybrid ring, Microwave propagation in ferrites, Faraday rotation, Circulators and isolators.

Unit-V

Microwave Tubes: Velocity modulation, Operation and performance of two-cavity klystron, Reflex klystron oscillator, Travelling wave tube (TWT) amplifier.

Unit-VI

Magnetron: Magnetron- mode separation, frequency pushing and frequency pulling and applications.
Microwave Solid State Devices-I: PIN diode, Varactor diode.

Unit-VII

Microwave Solid State Devices-II: Gunn effect & GUNN diode, IMPATT and TRAPATT and Parametric amplifier- principle and characteristics.

Unit-VIII

Microwave Measurements: Bolometric and thermocouple methods for measurement of power, Frequency, Attenuation, VSWR, Impedance measurements and measurement of scattering parameter for 3 and 4 port devices.

Text Books:

1. Samuel Y.Liao, *Microwave devices and circuits*, 3rd Edition, PHI 2003.
2. M. Kulkarni, *Microwave & Radar Engineering*, 3rd Edition, Umesh Publications 2003.

Reference Books:

1. O P Gandhi, *Microwave Engineering and Applications,* Pergamon Press 1989.
2. R.E. Collins, *Foundation of Microwave Engineering,* 2nd Edition, Wiley 2003.
3. E.C. Jordan and Balmain, *EM Fields & Waves and Radiating System,* 2nd Edition, PHI 2003.

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit.
The student shall answer any **FIVE** questions.

Course Outcomes:

- Students will be able to learn the advantages of microwave frequencies ,how to use microwave components, tubes and calculate various measurements.

INTEGRATED CIRCUITS AND APPLICATIONS (ICA)
(Common to III B.Tech - II Semester ECE & EEE)

Scheme : 2010
Contact Periods: (4L+1T) / Week
Credits : 5

Internal Assessment : 30
End Exam Marks : 70
End Exam Duration : 3 hrs

Course Objectives:

- To give introduction to OPAMPS, Timers and their applications in various areas.
- Introduction to logic families.

Unit-I

Op-Amp Fundamentals: Differential amplifier concept, op-amp ideal characteristics, Practical inverting and non-inverting op-amp, Study of typical IC op-amp and its different stages, Features of 741 op-amp, dc characteristics: i/p bias current, i/p offset current, Offset voltages, Offset balance, Thermal drift, ac characteristics: frequency response, stability of op-amp, Frequency compensation, Slew rate, op-amp parameters.

Unit-II

Op-amp Applications-I : Summing amplifier, difference amplifier, Current to voltage and voltage to current converters, Instrumentation amplifier, clippers and clampers, Precision AC to DC converters, Integrator, Differentiator, Log & antilog amplifier.

Unit-III

Op-amp Applications-II

Comparators and active filters: Comparators, window detector, Schmitt trigger, Pulse, Square and triangle wave generators, Sample and hold circuits. Active filters (Butterworth filters up to second order only).

Unit-IV

Timers & Waveform Generators: 555 Timer: Astable and Monostable modes, Applications, waveform generators: IC 566 and IC 8038.

Unit-V

Phase Locked Loops: Principle of operation, Lock and capture ranges, Detailed study of different blocks of PLL, IC 565 PLL, Applications of PLL.

Unit-VI

IC Regulators: General form of series Regulators, Fixed voltage regulator, IC 723 voltage regulator, Switching regulators – step up, Step down and inverting modes (IC UA 78S40)

Unit-VII

D/A and A/D Converters : DACs : Weighted resistor, R-2R ladder type and inverted R-2R ladder, DAC IC 1408L, ADCs: Parallel comparator, Counter, Successive approximation and dual slope types, ADC 0801, AD 574 (12 bit ADC), Specifications of converters.

Unit-VIII

Logic Families: Specifications of logic gates, DTL, HTL, TTL, RTL, DCTL, ECL, MOS and CMOS circuits, CMOS bilateral switch, Comparison of logic families, TTL driving CMOS and CMOS driving TTL.

Text Books:

1. Roy Choudhury & Shail B.Jain, *Linear Integrated Circuits*, New Age Int. Pub.
2. Ramakanth A. Gayakwad, *Op-Amps & Linear ICs*, 2nd Edition, PHI.
3. Moris Mano, *Digital Logic and Computer Design*, PHI.

Reference Books:

1. Sergio Franco, *Design with Operational Amplifier and Analog Integrated Circuits*, TMH.
2. Anand Kumar, *Pulse and digital Circuits,* PHI
3. Ronald J.Tocci, Neil S Widmor, *Digital Systems Principles and Applications,* Pearson Ed.

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit. The student shall answer any **FIVE** questions.

Course Outcomes:

- Students will be able to design different analog circuits based on opamps and Timer circuits for any application. Students gain a comprehensive understanding about logic families.

INTRODUCTION TO INFORMATION SYSTEMS (IIS)
(Common to III B.Tech II Semester ECE, EEE & ME)

Scheme : 2010 Internal Assessment : 30
Contact Periods: (4L+1T)/week End Exam Marks : 70
Credits: 5 End Exam Duration : 3hrs

Course Objectives:

- To give introduction to fundamentals of information systems like computer architecture, operating system, testing, debugging, coding standards, RDBMS, E-R modeling, SQL.

Unit-I

Fundamentals of Computers & Computer Architecture: Introduction, Organization of a small computer, Central Processing Unit, Execution cycle, Instruction categories, measure of CPU performance Memory, Input/output devices, BUS, addressing modes

Unit-II

System Software : Assemblers, Loaders and linkers, Compilers and interpreters.
Operating System : Introduction , Process Management, CPU scheduling, Memory Management Schemes , Page replacement algorithms.

Unit-III

Software Engineering: Introduction to software engineering, Life cycle of a Software Project, Software Development Models.
Testing, Debugging and Code Reviews: Unit Testing, Debugging, Debugging using the IDE, Code Review.

Unit-IV

Coding Standards and Best Practices: Introduction to C Programming, Basics of C Language, Data Types in C, Steps in creating programmes, Functions, arrays, pointers, structures.
Importance of Adhering to standards and best practices.
Sorting and Searching Techniques : Searching Algorithms – Linear Search, Binary Search, Sorting Algorithms – Bubble Sort, Selecting Sort and Insertion Sort.

Unit-V

Relational Database Management System: Introduction to DBMS, the database technology, data models. Database Users.
Entity Relationship (E-R) Modeling : Introduction, Notations, Modeling E-R Diagrams, Case Study 1,2 & 3, Merits and Demerits of E-R modeling.

Unit-VI

Structured Query languages (SQL): History of SQL, Data Types, Data Definition Language Statements (DDL), Data Manipulation Language (DML), writing simple queries, Embedded SQL, Online Transaction Processing

Unit-VII

Normalization : Introduction, Need for Normalization, Process Normalization, Types of Normal Forms (1 NF, 2 NF, 3 NF & BCNF), Merits and Demerits of Normalization, case study.

Unit-VIII

Transaction properties and concurrency: Acid properties, issues with concurrency – lost update, inconsistent summary and dirty read.

Data base locking techniques: Shared lock, exclusive lock and intent locks, Backup and Recovery

Text Books:

1. Campus Connect Foundation Programme – Computer Hardware and System Software Concepts, Programming Fundamentals- Vol. – 1, INFOSYS**.**
2. Campus Connect Foundation Programme – Relational Database management System, Client Server Concepts, Introduction to Web Technologies - Vol. – 2, INFOSYS
3. Campus Connect Foundation Programme – Object Oriented Concepts – System Development Methodology, User Interface Design - Vol. – 3, INFOSYS
4. Yashwant Kanetkar**,** Let us ‘‘C’’ - bpb Publications 8th ed., 2007.

Reference Books:

1. Andrew S. Tanenbaum, *Structured Computer Organization*, PHI, 3rd ed., 1991
2. Silberschatz and Galvin, *Operating System Concepts*, 4th ed., Addision-Wesley, 1995
3. Kernighan, Ritchie, *ANSI C language*, PHI,1992
4. Alfred V Aho, John E Hopcroft, Jeffrey D Ullman, *Design and Analysis of Computer Algorithms*, Addison Wesley Publishing Co., 1998
5 Wilbert O. Galitz, *Essential Guide to User Interface Design*, John Wiley, 1997
6. Alex Berson, *Client server Architecture*, Mc Grew Hill International, 1994
7. Henry F Korth, Abraham Silberschatz, *Database System Concept*, 2nd Edition, McGraw-Hill International editions, 1991
8. Brad J Cox, Andrew J.Novobilski, *Object – Oriented Programming – An evolutionary approach*, Addison – Wesley, 1991.
9. Rojer Pressman, *Software Engineering-A Practitioners approach*, McGraw Hill, 5th ed., 2001

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit.
The student shall answer any **FIVE** questions.

Course Outcomes:

- Students will have a comprehensive understanding of basics of information systems and will be able to design projects.

COMMUNICATIONS LAB (CM(P))
(For III B.Tech. ECE - II Semester)

Scheme : 2010
Contact Periods: 3P/Week
Credits : 2

Internal Assessment : 30
End Exam Marks : 70
End Exam Duration : 3 hrs

Course Objectives:

- Design and generation of AM,PM, FM,ASK,PSK, QPSK communication techniques
- Usage of Communications test equipment.

List of Experiments

1. Amplitude Modulation and Demodulation
2. Frequency Modulation and Demodulation
3. Pulse Width Modulation
4. Pulse Position Modulation
5. Pulse Code Modulation
6. SSB modulation and Demodulation
7. Pulse Amplitude Modulation
8. Time Division Multiplexing
9. Amplitude Shift Keying
10. Frequency Shift Keying
11. Phase Shift Keying
12. Delta Modulation and Demodulation
13. Adaptive Delta Modulation
14. QPSK Modulation and Demodulation
15. Pseudo Random Sequence Generator
16. DPCM Modulator and Demodulator
17. QAM /DQAM Modulation and Demodulation

Course Outcomes:

- The student will be able to design and evaluate the performance of different communication techniques and know how to use the communication test equipment.

LINEAR IC APPLICATIONS LAB (ICA(P))
(For III B.Tech. ECE - II Semester)

Scheme : 2010
Contact Periods: 3P/Week
Credits : 2

Internal Assessment : 30
End Exam Marks : 70
End Exam Duration : 3 hrs

Course Objectives:

- Designing and verifying various Analog circuits using ICs such 741,555 Timer

List of Experiments

1. Inverting and Non-inverting Amplifier.
2. Summing and differential amplifier.
3. Integrators and differentiators.
4. Precision Rectifiers
5. Schmitt Trigger.
6. Square wave Generator
7. Square and Triangle Wave Generator.
8. Active Filters – II Order LPF
9. Active Filters – II Order HPF
10. Digital to Analog Converter.
11. 723 Low Voltage and High Voltage Regulator
12. 555 Astable and Monostable Multivibrator
13. Sample and Hold Circuit
14. 8038 Waveform generator

Course Outcomes:

- Students will be able to design any application based on Opamp and Timer.

INTRODUCTION TO INFORMATION SYSTEMS LAB (IIS(P))
(Common to III B.Tech. - II Semester ECE, EEE & ME)

Scheme : 2010
Contact Periods: 3P/week
Credits: 2

Internal Assessment : 30
End Exam Marks : 70
End Exam Duration : 3hrs

Course Objectives:

- The objective of this course is to introduce to the students, different programming techniques in C and SQL.

List of Experiments Using C

1st Week:

1. Programs on Basic Programming constructs (if, switch-case, while, do while, for)

2nd Week:

2. Programs on Arrays
3. Write a program to Implement the Transpose of the matrix.(Modify the same matrix)

3nd Week:

Implementation of Searching Techniques

Linear Search
Binary search

4th Week:

Implementation of Sorting Techniques

Write a program to sort the given list with arrays using the following sorting techniques.

Selection sort
Bubble sort
Insertion sort
Quick sort

An institute wants to automate the process of allocating courses to vendors. Initially automation is considered for 5 vendors.

Assumption: one course could be allotted to many vendors.

Declare and initialize the following **arrays each of size 5:**

- An array to store the Vendor Ids. Initialize it with the following values
101, 102, 103, 104 and 105.
- An array to store the course Id's and initialize it with zeros.

- An array to store the amount (to be paid to the vendor for that course) and initialize it with zeros.

All the three arrays have one to one correspondence.

Consider the following table for the courseid and their corresponding amount details.

Course Id's	**Amount**
1001	25000
1002	35000
1003	20000
1004	15000
1005	20000

Display a menu to implement the following functionalities:

1. **Allocate course**
2. **Deallocate course**
3. **Report**

Implement the following functionality for each of the given options:

1. Allocate course

- Accept the VendorId
    - Display appropriate error message if the vendor id is invalid(if it is not found in the array of Vendor Ids)
    - Display appropriate error message if the vendor is already allotted to a course
- Accept the Course Id.
    - Display appropriate error message if the course id is invalid(not between 1001 and 1005)
- After validation, update CourseId and the related amount for the corresponding vendor.
- Display a message on successful allocation

2. Deallocate course

- Accept the VendorId
    - Display appropriate error message if the vendor id is invalid(if it is not found in the array of Vendor Ids)
    - Display appropriate error message if the vendor is not allotted with a course
- After validation corresponding CourseId and amount should be set to Zero.
- Display a message on successful deallocation.

3. **Report**

Generate a report in the following format for ONLY those vendors who have been allocated the courses.

Vendor Id	**Course Id**	**Amount**
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

5th Week
Basic SQL Queries (DDL, DML and DCL)

6th Week:

Queries using Aggregate functions
Account(BRANCHNAME, ACCNO, BALANCE)
Branch(BRANCHNAME, BRANCHCITY, ASSETS)

1. Find the average account Balance at the each branch.
2. Find the number of depositors at each branch
3. Find the names of all branches that have assets greater than at least one branch located at a particular city.

Sales (SNO, SNAME, AREA, GENDER, SAMOUNT)

1. List out the sales amount and names of the top 3 sales persons
2. List out the names and sales amount whose sales amount crosses the average sales amount of north and south.
3. List out the names and sales amount of those persons whose sales amount is greater than minimum sales amount of company and less than average sales amount of company.
4. List out top 5th sales person name sales amount.

7th Week:

Emp (EMPNO, ENAME, SAL, HIREDATE, DEPTNO, MGRNO)

5. Display all employ names which have the character ‘TH’ or ‘LL’ in them
6. List all employees hired between two given dates
7. List all employees by name, number, along with their manager name and number

8th Week:

Create the following tables and insert the data with appropriate constraints.

Table: Politician:Politician Details

Column Name		Description
VoterID	Number(5)	Primary Key
Name	Varchar2(15)	Name of the politician. Mandatory.
Address	Varchar2(50)	Address of the politician
City	Varchar2(20)	Place of Residence
ElectionsLost	Number(2)	Must be 0 or greater than zero

Sample Data:

VoterID	Name	Address	City	ElectionsLost
10001	Mohan	Hyderabad Road	Kurnool	2
10002	Ram	56, Ramapuram	Nandyal	3
10003	Eric	Kondareddy fort area	Kurnool	1
10004	William	Vijayanagar	Allagadda	7

Table: Party:Party Details

Column Name		Description
PartyCode	Number(3)	Primary Key
Name	Varchar2(15)	Name of the political party. Mandatory.
HQ	Varchar2(15)	Place where HQ is located

Sample Data:

PartyCode	Name	HQ
101	Party One	Hyderabad
102	Party Two	Kurnool
103	Party Three	

Table: ElectionResult : Details of Politicians who have won the election

Column Name		Description
Year	Number(4)	Year when elected.
Constituency	Varchar2(20)	Must be 'Kurnool' OR Nandyal' OR 'Allagadda'
PartyCode	Number(3)	Must be existing party code
VoterID	Number(5)	Must be existing Voter-id
Votes	Number(6)	Total number of votes the politician won by.

(Year, Constituency) is the Primary Key

Sample Data:

Year	Constituency	PartyCode	VoterID	Votes
1984	Kurnool	101	10003	12967
1986	Nandyal	102	10004	80876
1986	Kurnool	101	10003	100000

1986	Kurnool	102	10002	7023
1992	Nandyal	103	10001	602
1992	Nandyal	101	10004	6021

NOTE:
You are supposed to fill in the given records in above tables following these rules:
1. Identify the primary key and foreign key (if applicable) in each table.
2. Take care of the constraints and the relationships among the tables.

Queries
1. List details of all politicians whose name contains at least one 'a' and stay in 'Bangalore'.

2. List the Party name and the Politicians name who won from the Nandyal constituency in the year 1986.

3. List the Politicians details who have won by maximum number of votes after 1990.

4. List the party name, corresponding HQ, total number of times the party has won respectively.

Course Outcomes:
- Students will be able to design mini projects.

FOUR YEAR B.TECH. DEGREE COURSE

Scheme of Instruction and Examination
(Effective from 2010-2011)

IV B.Tech (ECE) – I Semester **Scheme : 2010**

S. No	Subject	Abbreviation	Credits	Scheme of Instruction periods/week			Duration of End Exam (Hours)	Scheme of Examination Maximum Marks		
				L	D/T	P		End Exam	Internal Assessment	Total
I	**Theory**									
1.	VLSI	VLSI	**5**	**4**	**1**	**–**	3	70	30	100
2.	Digital Image Processing	DIP	**5**	**4**	**1**	**–**	3	70	30	100
3.	Embedded Systems Design	EMS	**5**	**4**	**1**	**–**	3	70	30	100
4.	Optical Communications	OC	**4**	**4**	**-**	**–**	3	70	30	100
5.	Advanced Information Systems	AIS	**5**	**4**	**1**	**–**	3	70	30	100
6.	Professional Elective – I		**4**	**4**	**–**	**–**	3	70	30	100
II	**Practical**									
7.	VHDL & Embedded systems Lab	VHDL(P)	**2**	**–**	**–**	**3**	3	70	30	100
8.	Microwave & Fiber Optics Lab	MWFO(P)	**2**	**–**	**–**	**3**	3	70	30	100
9.	Mini Project & Comprehensive Viva	MPCV(P)	**3**	**–**	**–**	**4**	3	70	30	100
	Total		**35**	**24**	**4**	**10**		**630**	**270**	**900**

VLSI (VLSI)
(For IV B.Tech. ECE - I Semester)

Scheme: 2010 | Internal Assessment : 30
Contact Periods: (4L+1T) / Week | End Exam Marks : 70
Credits : 5 | End Exam Duration : 3 hrs

Course Objectives:

- The main objective of the course is to introduce the concepts of IC fabrication technologies and their corresponding Stick Diagrams
- The course will also introduce scaling techniques of CMOS devices and their effects
- The course will also familiarize the students with CAD/EDA tools

Unit-I

Introduction: Introduction to IC Technology – MOS, PMOS, NMOS, CMOS & BiCMOS technologies-Oxidation, Lithography, Diffusion, Ion implantation, Metallization, Encapsulation, Probe testing, Integrated Resistors and Capacitors.

Unit-II

Basic Electrical Properties : Basic Electrical Properties of MOS and BiCMOS Circuits: I_{ds} V_s V_{ds} relationships, MOS transistor threshold Voltage, g_m, g_{ds}, Figure of merit, Pass transistor, NMOS Inverter, Various pull ups and Pull downs, CMOS Inverter analysis and design, Bi-CMOS Inverters.

Unit-III

VLSI Circuit Design Processes : VLSI Design Flow, MOS Layers, Stick Diagrams, Design Rules and Layout, 2μ CMOS Design rules for wires, Contacts and Transistors Layout Diagrams for NMOS and CMOS Inverters and Gates, Scaling of MOS circuits, Limitations of Scaling.

Unit-IV

Gate Level Design : Logic Gates and Other complex gates, Switch logic, Alternate gate circuits, Basic circuit concepts, Sheet Resistance(R_S) concept and Sheet Resistance R_S in MOS, Area Capacitance Units, Calculations Delays, Driving large Capacitive Loads, Wiring Capacitances, Fan-in and fan-out, Choice of layers

Unit-V

Subsystem Design : Subsystem Design, Shifters, Adders, ALUs, Multipliers, Parity generators, Comparators, Counters, High Density Memory Elements.

Unit-VI

Semiconductor Integrated Circuit Design : PLAs, FPGAs, CPLDs, Standard Cells, Programmable Array Logic(PLA'S), Design Approach.

Unit-VII

VHDL Synthesis : VHDL Synthesis, Circuit Design Flow, Circuit Synthesis, Simulation, Layout, Design capture tools, Design Verification Tools, Test Principles.

Unit-VIII

CMOS Testing : CMOS Testing, Need for testing, Test Principles, Design Strategies for test, Chip level Test Techniques, System-level Test Techniques, Layout Design for improved Testability.

Text Books:

1. Kamran Eshraghian, Eshraghian Dougles and A. Pucknell, *Essentials of VLSI circuits and systems*, PHI, 2005 Edition.
2. Weste and Eshraghian, *Principles of CMOS VLSI Design*, Pearson Education, 1999.

Reference Books:

1. John .P. Uyemura, *Introduction to VLSI Circuits and Systems*, JohnWiley, 2003.
2. John M. Rabaey, *Digital Integrated Circuits*, PHI, EEE, 1997.
3. Wayne Wolf, Pearson Education, *Modern VLSI Design*, 3rd Edition, 1997.
4. S.M. SZE, *VLSI Technology*, 2nd Edition, TMH, 2003.

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit.
The student shall answer any **FIVE** questions.

Course Outcomes:

- Students will be able to understand the operation of a MOS transistor down to the physical level and relate this knowledge to the development of its operational equations.
- Students will be able to analyze and implement various logic gates and circuits using MOS transistors.
- Students will be able to develop the requirements of designing digital systems such as choice of logic family, testability, and VLSI system considerations.

DIGITAL IMAGE PROCESSING (DIP)
(For IV B.Tech. ECE - I Semester)

Scheme: 2010	Internal Assessment : 30
Contact Periods: (4L+1T) / Week	End Exam Marks : 70
Credits : 5	End Exam Duration : 3 hrs

Course Objectives:

- The objectives of this course are for students to learn the fundamental theories and techniques of digital image processing.

Unit-I

Introduction: Definition, Applications Of Digital Image Processing, Fundamental Steps, Components Of Image Processing System, Human Visual System, Simple Image Formation Model, Image Sampling And Quantization, Spatial And Gray Level Resolution, Image Interpolation, Some Basic Relationships Between Pixels, Linear And Non Linear Operations.

Unit-II

Image Enhancement In Spatial Domain: Basic Gray Level Transformations, Histogram Processing, Enhancement Using Logical And Arithmetic Operations, Image Subtraction, Image Averaging, Basic Of Spatial Filtering, Smoothing And Sharpening Spatial Filters, Combining Spatial Enhancement Methods.

Unit-III

Image Enhancement In Frequency Domain: Introduction To Fourier Transforms, Basics Of Filtering In Frequency Domain, Fundamental Steps In Filtering In Frequency Domain, Smoothing Frequency Domain Filters, Sharpening Frequency Domain Filters, Homomorphic Filtering.

Unit-IV

Image Transform: Introduction One and Two Dimensional Discrete Fourier Transform (DFT), Properties of DFT, Properties of Discrete Cosine and Sine transforms, Properties of Slant, KL and Affine transforms.

Unit-V

Image Restoration: Model Of Image Degradation/Restoration Model, Noise Models, Restoration In Presence Of Noise Only-Spatial Filtering, Adaptive Filters, Periodic Noise Reduction By Frequency Domain Filtering, Linear Position Invariant Derivations, Algebraic Approach To Restoration, Inverse Filtering, Least Mean Square Filters, Constrained Least Squares Restoration, Interactive Restoration.

Unit-VI

Image Compression: File format (bmp, tiff, pcx ,gif , jpeg.), Compression fundamentals, Image Compression Models, Error Free Compression: VLC, Arithmetic Coding, LZW coding, Bit plane Coding, Lossless Predictive Coding, Lossy Compression: Lossy Predictive Coding, Block Transform coding, Digital Watermarking

Unit-VII

Image Segmentation: Fundamentals, Detection of Discontinuities: Point, Line, Edge detection, Edge Linking and Boundary Detection: Local Processing, Regional Processing Global Processing via Hough Transform.

Unit-VIII

Color Image Processing: Color fundamentals, Color models: RGB, CMY and CMYK, HSI, Converting colors from RGB to HIS, HIS to RGB manipulating HIS component images, Pseudocolor Image Processing, Full Color Image Processing.

Text Books :

1. Rafael Gonzalez & Richard Woods*, Digital Image Processing*, 4th Edition. Pearson publications.
2. Anil K. Jain, *Fundamental of Digital Image Processing*, PHI publication

Reference Books :

1. Pratt *, Digital Image Processing*, Wiley Publication
2. K,R, Castleman, *Digital Image Processing*, Prentice Hall.
3. Milan Sonka, *Image Processing: Analysis and Machine Vision*, 3rd Edition, Thomson, 2008.

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit. The student shall answer any **FIVE** questions.

Course Outcomes:

- The study of digital image processing provides students with the knowledge to correctly apply the laws of nature to the creative formulation and solution of engineering problems through the use of analytical, computational and experimental techniques.

EMBEDDED SYSTEMS DESIGN (EMS)
(For IV B.Tech. ECE - I Semester)

Scheme : 2010 | Internal Assessment : 30
Contact Periods: (4L+ 1T) / Week | End Exam Marks : 70

Credits : 5 | End Exam Duration : 3 Hrs

Course Objectives:

- The main objective of the course is to get students familiar with the typical problems and constraints that arise when designing and developing embedded systems
- The course will also introduce theoretical and practical solutions to these typical problems that the students are expected to master and be able to apply to realistic case studies.

Unit-I

Introduction: Embedded systems overview, Design challenge, Processor technology. Single purpose processors RT-level combinational logic, Sequential logic (RT-level), Custom single purpose processor design (RT-level), Optimizing custom single purpose processors.

Unit-II

General Purpose Processors: Basic architecture, Operation, Pipelining, Application Specific Instruction-Set Processors (ASIPs) – Micro Controllers and Digital Signal Processors.

Unit-III

Introduction to MCS51 family: 8051 Micro controller Architecture, Input/Output ports and circuits, External memory, Counters and Timers, Serial data input/output, Interrupts.

Unit-IV

Basic Assembly Language Programming Concepts: Instruction set, Programming with 8051 Micro controller.

Unit-V

Interfacing of 8051: 8051 interfacing with LCD, ADC, Sensors, Stepper motor, Key board, DAC, Real Time Clock.

Unit-VI

Introduction to RTOS : Tasks and Task States, Tasks and Data, Semaphores and Shared data, Message Queues ,Mailboxes and Pipes, Timer Functions, Events , Memory management, Interrupt Routines in RTOS Environment.

Unit-VII

Basic Design Using RTOS: Principles, Semaphores and Queues, Hard Real- Time Scheduling considerations, Saving memory and Power.

Unit-VIII

PIC Microcontrollers: Overview and Features, Architecture Details of PIC 16C6X/7X, Instructions, Addressing modes, I/O Ports, Interrupts, Timer, ADC. Features of 16F8XX series.

Text Books:

1.Frank Vahid, Tony D.Givargis, *Embedded System Design – A Unified Hardware / Software Introduction*, John Wiley and Sons, 2002.

2. Mazidi Muhammad Ali, Mazidi Janice Gillespie & McKinlay Rolin D, *The 8051 Microcontroller and Embedded Systems*, 2nd Edition, Pearson Education, 2008.
3. Raj kamal, *Embedded Systems- Architecture, Programming and Design*, Tata McGraw Hill Education Private Ltd, 2003.

Reference Books :

1. Kenneth J. Ayala, *The 8051 Microcontroller*, Penram International Publication Ltd, 2006.
2. David E. Simon, *An Embedded Software Primer*, Pearson Ed, 2003

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit. The student shall answer any **FIVE** questions.

Course Outcomes:

- Be able to perform a rigorous analysis of a given problem, while taking into account the classical constraints of an embedded system
- Be able to implement the designed system, according to the model.

OPTICAL COMMUNICATION (OC)
(For IV B.Tech. ECE - I Semester)

Scheme : 2010 | Internal Assessment : 30
Contact Periods: 4L / Week | End Exam Marks : 70

Credits : 4 | End Exam Duration : 3 Hrs

Course Objectives:

- The main objective of the course is to provide a comprehensive knowledge in the area of Optical communication
- This course provides the overview of optical fibers, optical sources, optical Detectors and power launching methods and measurements.

Unit-I

Overview of Optical Communications: Introduction and Historical background, Elements of optical fiber communication, Advantages of optical fiber communication, Applications of optical communications.

Unit-II

Optical Fiber Waveguides: Nature of light-Spherical and planar wave fronts, Basic optical laws and definitions, Optical fiber modes and configurations, Mode theory of circular waveguides, Single and multi mode step index fibers, Fiber materials and fabrication.

Unit-III

Signal Degradation in Optical Fibers: Attenuation-Absorption, Scattering and bending losses in optical fibers, Core and cladding losses.

Unit-IV

Signal dispersion in optical waveguides: Intra modal dispersion (Material dispersion and wave guide dispersion), Intermodal dispersion, Pulse Broadening

Unit-V

Optical Sources and Photo Detectors: LED's –Structures, Light source materials, Internal quantum efficiency, Modulation capability, principles and operation of Febry perot and DFB laser diodes, Physical principles of PIN and APD, Noise in photo detectors.

Unit-VI

Optical Receiver and Digital Transmission Systems: Fundamental receiver operation, Digital receiver performance calculation, Analog receivers, Point-to-point links, Link power budget, Rise-time budget, Wavelength Division Multiplexing(WDM)

Unit-VII

Power Launching in Optical fibers: Source-to-fiber power launching basics, lensing schemes for power coupling improvement, fiber end face preparation, fiber joints and splices, fiber connectors.

Unit-VIII

Optical Fiber Measurements: Measurement of Attenuation-Cut back technique, Insertion loss method and OTDR, Measurement of dispersion-Time domain and Frequency domain measurements.

Text Books:

1. Gerd Keiser, *Optical Fiber Communications,* 3rd Edition, Mc Graw Hill,2004.
2. John M. Senior, *Optical Fiber Communications Principles and Practice,* 2nd Edition, Pearson, 2009.

Reference Books:

1. D.C. Agarwal, *Fiber Optic Communication,* 2nd Edition, S.Chand & Co, 2004.
2. Djafar K. Mynbaev, *Fiber Optic Communications Technology*, Pearson, 2001.
3. John Gowar, *Optical Communication Systems*, 2nd Edition, PHI, 2004.

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit. The student shall answer any **FIVE** questions.

Course Outcomes:

- The student should be able to understand the elements of Optical communication like Optical fibres,Sources and Detectors
- Students will able to calculate Power budget and measurements in Optical communication.

ADVANCED INFORMATION SYSTEMS (AIS)
(Common to IV B.Tech. - I Semester ECE & EEE)

Scheme : 2010
Contact Periods: (4L+1T)/week
Credits: 5

Internal Assessment : 30
End Exam Marks : 70
End Exam Duration : 3hrs

Course Objectives:

- To provide students with fundamental knowledge about the various facets of information systems and operations among others
- Have mastery of complex advanced data handling issues
- Have mastery of SQL queries and programming, including ability to develop stored procedures, triggers, user defined functions.
- Be familiar and have basic mastery of distributed database concepts and implementation procedures
- Be familiar with the internal workings of database systems, and be able to properly configure ("tune") DBMS for maximum performance
- Have mastered the basics of programming with databases in an OOP language

Unit-I

Object Oriented Concepts: Introduction, Programming Techniques, Introduction to Object Oriented Concepts, concept of Structured Procedural Programming, objects and its constituents,

Unit-II

Data Abstraction, Classification, Encapsulation and information hiding, Data Access Specifies, UML Notations of a class.

Unit-III

Inheritance, advantages of inheritance, Generalization and Specialization, forms of generalization, Multiple and Multilevel Inheritance, abstract classes, Polymorphism and binding, Implementation of OOC through C++.

Unit-IV

Introduction to computer Networks: Introduction, ISO – OSI 7 layered Architecture , Internetworking, IP Addressing, Assigning and Resolving IP Addresses, Network Security, Client Server Concepts.

Unit-V

Introduction to Web Technology: World Wide Web (WWW) and Hyper Text Transfer Protocol (HTTP), file transfer protocol (FTP), Domine Name Server(DNS), Web Security, Mobile Web Application

Unit-VI

Web Based Applications and Technologies, Case Study, Middleware Technologies, SQL Oriented Data Access, RPC, Transaction Processing Monitor

Unit-VII

Web Server, Application Server Case Study -Introduction to Web Server /App Server and Load Balancing Load Balanced Web/ App Servers Configuration

Unit-VIII

User Interface Design: Introduction to User Interface- its evolution, The process of User Interface Design, Elements of User Interface Design, Good Versus Bad User Interface Design, UID Principle, Tips and Techniques of designing a UID, Reports

Text Books:

1. Campus Connect Foundation Programme – Computer Hardware and System Software Concepts, Programming Fundamentals- Vol. – 1, INFOSYS**.**
2. Campus Connect Foundation Programme – Relational Database management System, Client Server Concepts, Introduction to Web Technologies - Vol. – 2, INFOSYS
3. Campus Connect Foundation Programme – Object Oriented Concepts – System Development Methodology, User Interface Design - Vol. – 3, INFOSYS
4. E.BALAGURUSWAMY, Object Oriented programming with C++, 2008.
5. Data Communications & Computer Networking, by Forouzan, Tata McGrawHill,

.

Reference Books:

1. M.P. Bhave and S.A. Patekar, *Object Oriented Programming with C++,* Pearson Education, 2008
2. Herbert Schildt ,*Teach Yourself C++,* TMH, 2007,
3. Herbert Schildt ,*The Complete Reference C++,* 2007.
4. Robert Lafore ,*Object Oriented Programming in Turbo C++,* 2008.

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit.
The student shall answer any **FIVE** questions.

Course Outcomes:

- Investigate advanced areas of Information Systems and produce well-argued critical evaluations of both the technology and its impact and its potential applications.
- Develop an effective solution to an organization's Information Systems requirements.
- Demonstrate an ability to independently develop existing Information Systems skills or acquire new skills.

VHDL AND EMBEDDED SYSTEMS LAB (VHDL (P))
(For IV B.Tech. ECE - I Semester)

Scheme : 2010
Contact Periods: 3P/Week
Credits : 2

Internal Assessment : 30
End Exam Marks : 70
End Exam Duration : 3 hrs

Course Objectives:

- Students will be able to design, simulate and synthesize different digital circuits using VHDL tools and synthesis tools.(Ex:Active HDL and Xilinx tools)
- Students will be able to work with Microcontrollers and how microcontrollers interact with embedded system baseboard by giving few real time examples.

List of Experiments

VHDL Programs for

1. Behavioral Modeling examples for Multiplexer, 4-bit adder, Priority Encoder, Decoder.
2. Behavioral Modeling examples for Shift Register, 4-bit Counter, 74381 ALU
3. Data Flow Modeling examples for Multiplexer, 4-bit adder, Priority Encoder, Decoder.
4. Data Flow Modeling examples for Shift Register, 4-bit Counter, 74381 ALU
5. Structural Modeling examples for Multiplexer, 4-bit adder, Priority Encoder, Decoder.
6. Structural Modeling examples for Shift Register, 4-bit Counter, 74381 ALU
7. Subprograms and Packages
8. Synthesis and Testing with FPGA Kit

Embedded Systems Experiments

9. Interfacing an LED and a Switch to 89C51
10. LCD Interfacing
11. Stepper Motor Interfacing to 89C51
12. Square Wave Generation using Internal Timer of 89C51

Course Outcomes:

- Understand how to work with industry standard tools in VLSI/VHDL domain.
- Students get familiar with FPGA and CPLD Chips(Ex:Xilinx Spartan devices)
- Familiar with JTAG cables, concept of PROM, and dumping Bit (*.bit) files into chips.
- Familiar with Microcontrollers, RS-232,LED,LCD interfacing.
- Working principles of sensors.

MICROWAVE AND FIBER OPTICS LAB (MWFO(P))
((For IV B.Tech. ECE - I Semester)

Scheme : 2010
Contact Periods: 3P/Week
Credits : 2

Internal Assessment : 30
End Exam Marks : 70
End Exam Duration : 3 hrs

Course Objectives:

- To provide knowledge on various types of waveguides.
- To find the S-matrix of different Junctions.
- To obtain Gun Diode and RKO characteristics.
- To find numerical aperture and bending losses of given optical fiber.

List of Experiments

1. Reflex Klystron Oscillator Characteristics
2. Frequency, Wavelength and VSWR Measurements
3. GUNN Diode Characteristics
4. Impedance Measurement of Unknown Load
5. S-Matrix of E and H Plane Tees
6. S-Matrix of Magic Tee
7. S-Matrix of Circulator
8. S-Matrix of Directional Coupler
9. Radiation Pattern of Horn Antenna
10. Fiber Optic Communication
11. Laser Diode Characteristics

Course Outcomes:

- Students are able to measure frequency, wavelength and VSWR at microwave frequencies.
- Students are able to design a communication system using optical fiber as medium.
- Students are able to understand the working principle of Gun Diode and RKO

FOUR YEAR B.TECH. DEGREE COURSE

Scheme of Instruction and Examination

(Effective from 2010-2011)

IV B.Tech (ECE) – II Semester # **Scheme : 2010**

S. No	Subject	Abbreviation	Credits	Scheme of Instruction periods/week			Duration of End Exam (Hours)	Scheme of Examination Maximum Marks		
				L	D/T	P		End Exam	Internal Assessment	Total
I	**Theory**									
1.	Professional Elective – II		**4**	**3**	**1**	**–**	3	70	30	100
2.	Professional Elective – III		**4**	**3**	**1**	**–**	3	70	30	100
3.	Open Elective – II		**2**	**2**	**–**	**–**	**–**	**–**	100	100
II	**Practical**									
4.	Project work	PW(P)	**10**	**–**	**–**	**6**	**–**	70	30	100
	Total		**20**	**8**	**2**	**6**		**210**	**190**	**400**
OR										
I.	Practice School / Internship	PS	**10**	-	-	-	-	-	100	100
II.	Project work	PW(P)	**10**	**–**	**–**	**–**	**–**	70	30	100
	Total		**20**	**–**	**–**	**–**		**70**	**130**	**200**

A Student either to study 3 subjects (2 professional electives and one open elective) in IV B.Tech – II Semester of Scheme 2010 or to attend practice School / internship to be arranged by the Training and Placement cell of the College.

* Out of 100 marks, 70 marks will be evaluated by the external supervisor of the concerned company based on their attendance and day-to-day Performance. 30 marks will be evaluated by the concerned department of the college based on the report submitted by the student and viva-voce.

LIST OF OPEN ELECTIVES

Open Elective - I

1. Professional Ethics and Human Values (PEHV)
2. Intellectual Property Rights (IPR)
3. Entrepreneurship Development. (EDP)

Open Elective - II

1. Indian Constitution and Society (ICTS)
2. Research Methodology (RM)
3. General Psychology (GPY)

PROFESSIONAL ETHICS AND HUMAN VALUES (PEHV)
(Open Elective-I for III B.Tech - II Semester All Branches)

Scheme : 2010 Internal Assessment : 100
Contact Periods: 2L / Week
Credits : 2

Course Objectives:

- To help the students appreciate the essential complimentarily between VALUES and SKILLS to ensure sustained happiness and prosperity which are the core aspirations of human beings.

Unit-I

Human Values: Morals- Values- Ethics-Integrity-Work Ethic- Respect for others-Peaceful Life-Honesty- Courage Valuing Time- Empathy- Character- Spirituality

Unit-II

Engineering Ethics: Senses of Engineering Ethics- Variety of Morals-Types of Inquiry-Kohlberg's Theory- Gilligan's Theory-Consensus & Controversy-Models of Professional Roles -Customs and Religion-Uses of Ethical Theories

Unit-III

Safety, Responsibilities & Rights: Safety and Risk-Risk benefit analysis and reducing risk-Collegiality and loyalty-Respect for Authority
Confidentiality-Occupational Crime-Professional Rights-Employee Rights-Intellectual property Rights (IPR) – it's Discrimination

Unit-IV

Global Issues : Multinational Corporations-Environmental Ethics-Computer Ethics-Engineer as Managers-Consulting Engineer-Moral Leadership-Sample ode of Ethics Like ASME, ASCE, IEEE, Institute of Engineers, Indian Institute of Materials Management, IETE etc.,

Text Books:

1. M.P. Raghavan, *"Professional Ethics and Human Values*", Scitech Publications (I) Pvt. Ltd.
2. Jayashree Suresh, B.S.Raghavan, *Human Values and Professional Ethics*, S.chand Pub.

Reference Books :

1. Mike Martin and Roland Schinzinger, *Ethics in Engineering,* McGraw-Hill, New York.
2. Charles D.Fleddermann, *Engineering Ethics*, Prentice Hall, New Mexico.
3. S.Dinesh Babu, *Professional Ethics and Human Values*, Laxmi Publications, Hyderabad

Course Outcomes:

- Students will be able to differentiate the values and skills and will know How to cherish in profession and at the same time live life peacefully and happily.

INTELLECTUAL PROPERTY RIGHTS (IPR)
(Open Elective-I for III B.Tech - II Semester All Branches)

Scheme : 2010 Internal Assessment : 100
Contact Periods: 2L / Week
Credits : 2

Course Objectives:

- To provide an understanding of basic concepts of IP relating to technology
- To give an insight into IP Management, Licensing, Valuation, Audit and other aspects of IP.
- To teach basic skills necessary for a good IP hygiene within the company.

Unit-I

Basics of IPR: Introduction to IPR-IPR Systems-Benefits of IPR-Various Types of IPR-Violation of IPR

Unit-II

Patents: Introduction to Patents-Various kinds of Patents-Patenting Process-Copy Right-Remedies against Infringement

Unit-III

Method of Designing Registrations: Designing Registrations-How Chart for Registration-Trade Mark-Geographical Indications
Integrated Circuits-Trade Secrets

Unit-IV

IPR Policy and Management: IP in various sectors like Government and Nation-R &D organizations-IT, Media, Entertainment
Chemical Engineering & Services Sector-Industries & Small Scale Industry

Text Books:

1. Bain Bridge, *National Research Development Corporation, Intellectual Property Rights: Key to New Wealth,* Pearson Ed.
2 Prabuddha Ganguli, *Intellectual Property Rights*, TMH.

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Course Outcomes:

- Students will have a comprehensive understanding of basics of IP related topics.

ENTREPRENEURSHIP DEVELOPMENT (EDP)
(Open Elective-I for III B.Tech - II Semester All Branches)

Scheme : 2010 Internal Assessment : 100
Contact Periods: 2L / Week
Credits : 2

Course Objectives:

- The significance of entrepreneurship
- Entrepreneurial processes - from finding and evaluating good business opportunities to new venture start-up and growth issues
- entrepreneurial behavior, a critical success factor in new venture creation

Unit-I

Introduction: Concept of an entrepreneur; Definition of an entrepreneur; Types of entrepreneurs; Characteristics of an entrepreneur.

Entrepreneurship : Definitions; Theories of entrepreneurship; Key elements of entrepreneurship; Six important segments of entrepreneurship environment; Advantages of entrepreneurship; Barriers to entrepreneurship; Role of entrepreneurship in economic development.

Unit-II

Rural Entrepreneurship: Meaning; Need; Retrospection of rural industrialization in India; Problems of rural entrepreneurship; Development plan for rural entrepreneurship.

Small Enterprises : Definition of SSI; Types, Characteristics of SSI; Role of SSI in economic development; Problems faced by SSI.

Unit-III

Project Planning : Project Identification; Project Selection; Project Report – Contents & Formulation; Methods of Project Appraisal.

Ownership Structures : Sole Proprietorship; Partnership; Company; Co-operative; Selection of appropriate ownership structure.

Unit-IV

Institutional Finance: Commercial banks; Other Financial Institutions – IDBI, IFCI, ICICI, IRBI, SFC, SIDC, SIDBI & EXIM Bank.

Institutional Support : Need; Support to Small Entrepreneurs – NSIC, SIDO, SSIB, SSIDC, SISI, DICs.

Text Books:

1. Prof. Satish C. Ailawadi & Mrs.Romy Banerjee, *Principles of Entrepreneurship*, Everest Publishing House Publishers.
2. Parl.V.G, S.S. Khanka, *Entrepreneurial Development*, S. Chand & Company Ltd. Publishers.

Course Outcomes:

- Students will be able to *Realize the importance of entrepreneurship development Assess their personal entrepreneurial personalities/qualities
- Understand the business environment (macro and micro environment), cultural values, available government programs on entrepreneurship

- Acquire basic competencies in business planning i.e. marketing, production, organization and management, and finance

INDIAN CONSTITUTION AND SOCIETY (ICTS)
(Open Elective-II for IV B.Tech - II Semester All Branches)

Scheme : 2010 Internal Assessment : 100
Contact Periods: 2L / Week
Credits : 2

Course Objectives:

- To create a meaningful understanding of basic philosophical tenets of Indian Constitutional law. It is to underline the significance of our constitution as Fundamental Law of the land the course aims at instilling not just a bare understanding but a perspective on constitutional developments in Indian Constitutional Law.

Unit-I

Historical back ground-Preamble to the Constitution of India-Fundamental rights-Derivative principles of state policy-Elections in India- Indian Judiciary

Unit-II

Union Executive: Structures of Union Government & Functions-President-Vice President-Prime Minister-Cabinet
Parliament-Supreme Court of India
State Executive : Structures and Functions-Governor-Chief Minister-Cabinet-State Legislature-High Courts & Sub ordinate courts

Unit-III

Central – State Relations-President's Rule-Constitutional Amendments [42, 44, 74, 76, 86 & 91]-Constitutional functionaries-Working of Parliamentary system in India

Unit-IV

Nature, Meaning & Definition, Indian Social Structure-Language in India-Political Parties & Presume groups-Right of Women-S.C's, S.T's & other weaker sections.

Text Books :

1. Durga Das Basu, *Introduction to the Constitution of India*, 19th Edition, Wedwe & Company.
2. Macivel, *An Introduction Analysis*, Page Society.
3. M.V.Pylee, *Indian Constitution* , S.Chand Pub.

Course Outcomes:

- Able to know about the laws of Indian constitution & Society and its developments

RESEARCH METHODOLOGY (RM)
(Open Elective-II for IV B.Tech - II Semester All Branches)

Scheme : 2010 Internal Assessment : 100
Contact Periods: 2L / Week
Credits : 2

Course Objectives:

- To provide insight about Research design and sampling design, data collection and processing
- sampling fundamentals and Report writing

Unit-I

Research Methodology: Introduction -Objectives of Research-Types of Research-Research Methods (Vs) Methodology
Researching process-Technique involved in defining a problem

Unit-II

Research Design and Sampling Design: Need for Research Design-Features of good Design-Concepts Related to Research Design-Different research designs-Basics Principles of Experimental Designs-Steps in sampling design-Characteristics of good sample design-Various types of sample designs-Complex Random sampling designs

Unit-III

Data Collection and Processing: Data Collection through observation method & Interview Method-Data Collection through Questionnaires & schedules -Collection of Secondary data
Processing: Measures of Central Tendency-Measures of Dispersion-Measures of Asymmetry -Measures of Relationship-Simple Regression Analysis-Chi-square Test for comparing valiance

Unit-IV

Sampling Fundamentals & Report Writing: Central Limit Theorem-Sampling Theory-Concept of standard error-Estimating population Mean-Sample size & Determination-Technique for Interpretation-Significance of Report writing-Types of Reports-Mechanics of writing a Research Report

Text Book:

1. C.R. Kothari, *Research Methodology (Methods & Techniques)*, New Age International Publishers.
2. R.Cauvery, V.K.Sudha Nayak, M.Girija, *Research Methodology*, S.Chand Publishers.

Course Outcomes:

- Able to know about the complete process in research methodology and report preparation

GENERAL PSYCHOLOGY (GPY)
(Open Elective-II for IV B.Tech - II Semester All Branches)

Scheme : 2010 Internal Assessment : 100
Contact Periods: 2L / Week
Credits : 2

Course Objectives:

- To provide insight about Methods of Psychology, Psychological basis behavior ,Instincts, Emotional senses.
- Problem solving ability ,Intelligence characteristics of personalities

Unit-I

Introduction: Defining Psychology & Behavior-Branches and fields of Psychology-Utility of Psychology
Methods of Psychology: Introspection Method-Naturalistic observation-Experimental Method-Differential Method-Clinical Method-Psycho Physical Methods

Unit-II

Physiological Basis of Behavior: The Neuron-Central Nervous system-Brain and localization of Brain functions-Spinal chord
Influence of Nervous system on human behavior-Endocrine system and it's impact-The role of heredity and environment in the development of personality

Unit-III

Instincts, Emotions Senses and Sensitivity: Instincts and Reflex actions-Emotion & it's characteristics-Physiology of Emotions-Sensation and Sensitivity
Thinking, Reasoning and Problem Solving: Nature of thinking-Elements of thoughts-Tools of thinking-Rigidity-Types of thinking-Reasoning & types-Problem solving and it's methods

Unit-IV

Motivation and Behavior & Attention & Learning: Biological and socio psychological Needs-Drives and Incentives-Motives and Types of Motives-Types & Effect of attention-Types of Learning-Problem Solving-Mechanism of Memorization.
Intelligence – Aptitude – Personality : Nature of Intelligence-Concept of Metal age and IQ-Constantly of IQ-IQ Classification-Aptitude Ability & Achievement-Measurement of Aptitude -Features and Characteristics of Personality-Personality Assessment-Walters social Learning Theory

Text Book:

1. S.K. Mangal, *General Psychology*, Sterling Publishers Private Limited, New Delhi.

Reference Book :

1. Saundra K.Ciccarelli&Gkenn E.Meyer, *Psychology,* Pearson Ed.

Course Outcomes:

- Able to know about the psychological methods and the personality development

LIST OF PROFESSIONAL ELECTIVES

1. Mobile Communications (MCN)
2. Introduction to Operating Systems (ITOS)
3. Computer Networks (CN)
4. Neural Networks and Fuzzy Logic (NNFL)
5. Advanced Microprocessors (AMPR)
6. Industrial and Power Electronics (IPE)
7. Radar Engineering. (RE)
8. Biomedical Instrumentation (BMI)
9. Microwave Devices and Integrated Circuits (MIC)
10. Detection & Estimation of Signals (DES)
11. Wavelet Transform and its Applications (WTA)

MOBILE COMMUNICATIONS (MCN)
(Professional Elective for IV B.Tech ECE)

Scheme : 2010
Contact Periods: (3L+ 1T) / Week
Credits : 4

Internal Assessment : 30
End Exam Marks : 70
End Exam Duration : 3 hrs

Course Objectives:

- The main objective of the course is to provide a comprehensive knowledge in the area of mobile communication
- This course provides the overview of Digital mobile telephony and Digital Cellular systems.

Unit-I

Introduction: Basic Cellular System, Operation of Cellular system, Hexagonal cells, Frequency reuse of channels, Co-channel interference reduction. Cell splitting

Unit-II

Cell Coverage: Incident, Reflection & Elevation angle, Point to point modes, path loss formula, path loss from point to point prediction model, Mobile to Mobile propagation

Unit-III

Cell site Antennas & Mobile Antennas: Antenna at cell site and mobile antennas.
Frequency Management & Channel Assignment: Frequency management, Frequency-spectrum utilization, Set-up channels, Channel assignment to cell site & mobile units, Fixed & non-fixed channel assignment.

Unit-IV

Hand offs : Why hand off(H.O), Types of H.O, Delaying H.O, Queuing H.O., Initiation of H.O, Forced H.O, Intersystem H.O, Power difference H.O, Mobile assisted H.O, Soft H.O
Switching & Traffic: Space & Time switching, Analog switching equipment for cellular mobile system, Cellular digital switching equipment, MTSO inter connections.

Unit-V

Introduction to Digital Mobile Telephony: Introduction to digital technology, ARQ techniques, Stop and wait ARQ, Selective reference mission with ARQ. Multiple access schemes.

Unit-VI

Digital Cellular System: Global system for mobile communication (GSM), GSM architecture, layer modeling, Transmission, GSM channels & channel modes, Radio resources management, Mobility management, Communication management, Network management.

Unit-VII

Intelligent Cell Concept & Applications: Intelligent cell concept, Power-delivery intelligent cells, Processing grain intelligent cells. Applications of intelligent cell concept.

Unit-VIII

Intelligent Network for Wireless Communication: Advanced intelligent network (AIN) & Its architecture. SS7 protocol model, AIN for mobile communication.

Text Books:

1. Lee William C.Y, *Mobile Communications Engineering Theory and Applications*, 2nd Edition, McGraw Hill.
2. Lee William.C.Y, *Mobile Cellular Telecommunications Analog and Digital System,* 2nd Edition, Mc Graw Hill.

Reference Books:

1. Legsdon Tom, *Mobile Communication Satellites*, McGraw Hill.
2. Pandya Raj, *Mobile and Personal Communication Services and Systems*, PHI.
3. Schiller Joden H, *Mobile Communications,* Pearson Ed.

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit.
The student shall answer any **FIVE** questions.

Course Outcomes:

- The technical knowledge provided in the course on different aspects of the system will help the student in understanding the functioning of cellular system. This will further help in providing the necessary expertise required by the Mobile industry.

INTRODUCTION TO OPERATING SYSTEMS (ITOS)
(Professional Elective for IV B.Tech ECE)

Scheme : 2010
Contact Periods: (3L+ 1T) / Week
Credits : 4

Internal Assessment : 30
End Exam Marks : 70
End Exam Duration : 3 hrs

Course Objectives:

- Main objective the course is to provide insight about introduction to OS ,Memory Management, Concept of Virtual Memory, File Systems, Deadlocks, Protection Policies and Distributed systems

Unit-I

Introduction: Concepts of operating systems – Process, Files, System calls, Shell, Operating system structure – Monolithic layered systems, Virtual machines and client – Server model.

Unit-II

Memory Management: Preliminaries, Bare Machines, Resident Monitor, Swaping, Multiple partitions, Paging and Segmentation, Combined systems.

Unit-III

Virtual Memory: Overlays, demand paging, Performance of demand paging, Page replacement, Virtual memory concepts, Page replacement algorithms, Allocating algorithms, Thrashing.

Unit-IV

File Systems: File concepts, File support, Access Methods, Allocation Methods, Directory Systems, File protection and implementation issues.

Unit-V

DeadLocks: Deadlock problem, deadlock characterization, Deadlock prevention, Deadlock avoidance, Deadlock detection and Deadlock recovery.

Unit-VI

Protection: Goals of protection, mechanisms and policies, Domain of protection, Access matrix, implementation of access matrix, Dynamic protection structures, Revocation, Existing systems, languages – Based protection, Protection problems, Security.

Unit-VII

Distributed systems: Motivation, Topology, Communication, system type, File systems, Mode of computation, Event ordering, Synchronization.

Unit-VIII

Deadlock handling: Deadlock handling in distributed systems, Robustness, Reaching agreement, Election algorithms.

Text Books:

1. Abraham Silberschatz, *Operating System Concept,* 6th Edition, John Wiley.
2. Andrew S.Tanenbaum, *Modern Operating System,* 3rd Edition, Pearson Ed.

Reference Books:

1. James L.Peterson, Abraham Silberschatz, *Operating System Concepts,* Addison Wesley.

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit.
The student shall answer any **FIVE** questions.

Course Outcomes:

- Students will acquire the knowledge about the OS principles-design, memory management and distributed systems

COMPUTER NETWORKS (CN)
(Professional Elective for IV B.Tech ECE)

Scheme : 2010 Internal Assessment : 30
Contact Periods: (3L+1T) / Week End Exam marks :
70 Credits: 4 End Exam Duration : 3 hrs.

Course Objectives:

- To understand various reference models and their structures in the networking Domain.
- To understand different Protocols used in latest Internet Domain.

Unit-I

Introduction to Data Communication Networks:- Network Services and Architecture.
Reference models: ISO OSI Reference model, TCP/IP Reference model.
Broad band ISDN and ATM networks.

Unit -II

Physical Layer: Transmission media, Data modems, RS-232 Interfaces, Switching and Multiplexing(FDM,TDM & WDM).

Unit -III

Data Link Layer: Design issues, Error detection and correction, Stop-and-wait, Go-Back-N and Selective Repeat ARQ, HDLC protocol, Aloha protocol, CSMA protocols.

Unit -IV

Introduction to IEEE standards: MAC sub layer (specifications and frame structure), & Physical layer for IEEE 802.3 (CSMA/CD) standard, IEEE 802.4 (Token bus) standard, IEEE802.5 (Token ring) standard, Introduction to Wireless LANs, Networking and internetworking devices.

Unit -V

Network Layer: Virtual circuit and datagram approach in subnets, Shortest path routing, Flooding, Hierarchical routing, Broadcast routing, multicast routing and distant vector routing algorithms, Congestion control algorithms.

Unit -VI

Transport Layer: Transport services, addressing, upward and downward multiplexing, TCP and UDP.
Session Layer:- Encryption-DES Algorithm, Public key cryptography-RSA Algorithm.

Unit -VII

Application Layer: HTTP- Transaction, Request messages, Response message, Headers.
WWW: Introduction to Browser architecture, Types of documents.

Unit -VIII

DNS: Introduction to name spaces, DNS in the internet, Resolution, DNS messages.
VOIP: Basics of SIP.

Text Books:

1. Andrew S. Tanenbaum, *Computer Networks*, Third edition, PHI, 2001.
2. Behrouz.A.Forouzan, *Data communications and Networking*, Second edition, TMH, 2003.

Reference Books:

1. William Stallings, *Data and Computer Communications*, 3rd edition, Pearson, 2007.
2. Gerd Keiser, *Local Area Networks*, second edition, TMH, 2002.

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit.
The student shall answer any **FIVE** questions.

Course Outcomes:

- Students acquire knowledge about latest Protocols in the field of Network Domain.
- Students acquire knowledge about encryption and decryption algorithms used in communication and Networking Domain.

NEURAL NETWORKS AND FUZZY LOGIC (NNFL)
(Professional Elective - Common to IV B.Tech. ECE & EEE)

Scheme : 2010
Contact Periods: (3L+ 1T) / Week
Credits : 4

Internal Assessment : 30
End Exam Marks : 70
End Exam Duration : 3 hrs

Course Objectives:

- This course presents an overview of the theory and applications of artificial neural network and fuzzy systems to engineering applications with emphasis on signal processing and control.

Unit-I

Biological Neural Networks: Organization of human brain, Neuron functions, Cell body, Axon, Dendrites, Cell membrane, Computers and human brain.

Artificial Neural Networks: Artificial neuron, Mc Culloah-Pitts neuron model,
Characteristics, activation functions, Architectures(single layer and multi layer) and applications of ANNs. Training: supervised and unsupervised, Different learning rules.

Unit-II

Perceptrons: Perceptron representation, Ex – OR problem, Linear separability, Learning, Training algorithm, Advanced algorithm(Back propagation) and applications.

Unit-III

Counter Propagation Networks: Introduction, Network structure, Normal operation, Weight selection, Training Kohenen and Grossberg layers, Full counter propagation network, applications.

Hopfield Networks: Recurrent network configurations, Applications

Unit-IV

Statistical Methods: Training, application, Boltzman training, Back propagation and Cauchy`s training.

Unit-V

Bidirectional Associative Memories (BAM): BAM structure, Retrieving a stored association, Encoding association, Memory capability, Types of BAM: Continuous, Adaptive, Competitive.

Adaptive Resonance Theory: ART architecture, Implementation, Training example, Characteristics.

Unit-VI

Introduction To Fuzzy Systems: Classical (Crisp) sets, Notation, Basic concepts, Fuzzy sets , basic concepts, Properties of fuzzy sets, Fuzzy operations: Compliment, Union, Intersection.

Fuzzy Relations: Binary relations review, Equivalence and similarity relations, Compatibility relations, Orderings and Morphisms.

Fuzzy Measures: Belief and plausibility measures, Probability, Possibility and necessity measures.

Unit-VII

Adaptive Fuzzy Systems: Neural and fuzzy machine intelligence, Fuzzyness as multi-variance, Fuzzyness in probabilistic world, randomness Vs ambiguity, Sets as points in cube.

Unit-VIII

Fuzzy Associative Memories (FAM): Fuzzy systems as between cube mappings, Fuzzy and neural function estimators, Neural Vs fuzzy representation of structured knowledge, FAMs as mappings, Fuzzy Hebb FAMS: Bidirectional FAM theorem, Superimposing FAM rules, FAM system architecture.

Text Books:

1. Philip D. Wasserman, *Neural Computing, Theory and Practice*, Van Nostrand Reinhold.
2. George I. Klir and Tina A. Folger, *Fuzzy Sets, Uncertainty and Information (unit 4),* PHI
3. Bart Kosko, *Neural Networks and Fuzzy Systems* (unit 5), PHI.

Reference Books:

1. Jacek M. Zurada, *Introduction to Artificial Neural Systems*, Jaico Publishing House.
2. Laurence Fausett, *Fundamentals of Neural Networks, Architectures, Algorithms and Applications*, Pearson Ed.
3. Timothy Ross, *Fuzzy Logic with Engineering Applications*, TMH.
4. Fakhreddine O.Karray, Clarence De Silva, *Soft Computing and Intelligent Systems Design*, Pearson Ed.

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit. The student shall answer any **FIVE** questions.

Course Outcomes:

- The student will be able to understand various neural network and fuzzy systems models and the applications of these models to solve engineering problems.

ADVANCED MICROPROCESSORS (AMPR)
(Professional Elective for IV B.Tech ECE)

Scheme : 2010
Contact Periods: (3L+ 1T) / Week
Credits : 4

Internal Assessment : 30
End Exam Marks : 70
End Exam Duration : 3 Hrs

Course Objectives:

- To introduce the architectural details of various advanced microprocessors (80186, 286 to Pentium IV).

Unit-I

The 80186 & 80286 Microprocessors: 80186**:** Block Diagram, Pin definitions 80286: Block diagram, pin definitions, Real address mode, Protected mode, New and enhanced instructions.

Unit-II

The 80386 Microprocessors: Architecture, Pins and signals, Operating modes, Memory organization, Registers, New addressing modes.

Unit-III

The 80386 Memory Management: Memory management , Paging Mechanism.

Unit-IV

The 80486 Microprocessors: Block diagram & Pin definitions. Cache level description.

Unit-V

Pentium Processor: Salient features of Pentium, Architecture, branch prediction, MMX architecture.

Unit-VI

Pentium Pro and Pentium II processor.: Salient features of Pentium pro and Pentium II Processor.

Unit-VII:

Pentium IV Microprocessor: Salient features of PIV, Block diagram, Hyper threading in Pentium.

Unit-VIII:

Advanced Peripherals: CRT Controller 8275, Floppy disc controller 8272, Keyboard and display controller 8279.

Text Books:

1. Barry B. Brey, *The Intel Microprocessor 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium and Pentium Pro Processor Architecture, Programming and Interfacing*, 8th Edition, Princeton Hall India,2009.
2. A.K.Ray & K M Bhuruchandi, *Advanced Microprocessors & Peripherals*, 2nd Edition, Tata McGraw Hill Education Private Ltd, 2010.

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit. The student shall answer any **FIVE** questions.

Course Outcomes:

- Student will acquire the knowledge in architectural details of various processors and able to compare the architectural differences between the various microprocessors

INDUSTRIAL AND POWER ELECTRONICS (IPE)
(Professional Elective for IV B.Tech ECE)

Scheme : 2010
Contact Periods: (3L+ 1T) / Week
Credits : 4

Internal Assessment : 30
End Exam Marks : 70
End Exam Duration : 3 hrs

Course Objectives:

- To study about power electronic circuits for voltage and current control and protection.
- To learn the switching characteristics of transistors and SCRs. Series and parallel functions of SCRs, Programmable triggering methods of SCR.
- To learn controlled rectification AC supplies.
- To study of converters and inverters.
- To learn about motor control, charges, SMPS and UPS.

Unit-I

Silicon Controlled Rectifiers: Characteristics, ratings, Turn-on, Turn-off mechanisms (SCR, Diac, Triac, LASER, GTO) Gate characteristics and Protection circuits.

Unit-II

Thyristor Firing Circuits: Methods of turning on of a thyristor, Principal features of firing circuits. Simple R and RC triggering circuits, UJT pulse triggering circuits.

Unit-III

High Current Converters: Review of a single phase rectifier, Polyphase rectifiers using silicon diodes, Single phase and Polyphase controlled rectifiers using SCRs with resistive and inductive loads, Transformer utilisation factor, Free wheeling diode operation , Effects of source inductance.

Unit-IV

Methods of Commutation : Class A, B, C, D & E and F types of commutation

Unit-V

DC Choppers: Basic principle of chopper- Types of chopper circuits, Voltage current commutated D.C. choppers and Morgan's chopper.

Unit-VI

Inverters: Series, Parallel and Bridge inverters, Single phase and Three phase inverters- Mc-Murray inverter and Mc-Murray Bedford inverter, Current source inverter.

Unit-VII

Phase Controlled Cyclo-Converter: Single phase and three phase cyclo-converters, Circulating and non circulating current modes of operation.

Unit-VIII

Speed Control: Speed control of DC motors using converters and choppers- Speed control of induction motors using inverters and cyclo-converters, Slip power recovery scheme. (simple treatment only)

Text Books:

1. M.Ramamoorthy, *An Introduction to Thyristors and their Applications*, East West Pub.

2. Dr.P.S. Bhimbhra, *Power Electronics*, Khanna Pub.
3. Chute and Chute, *Electronics in Industry*, McGraw-Hill.

Reference Books:

1 M.S.Burde,.*Thyristor Engineering* , Khanna Publications.
2. G.K. Dubey, S.R. Doradia, A.Joshi, A.M.K.Sinha, *Thyristorised Power Controllers*, Wiley Eastern.
3. Williams .B.W, *Power Electronics Device Drives and Applications*, Mc Millan Publications.
4. B.D.Bedford and R.G.Hoft, *Principles of Inverter Circuits*, John Wiley.
5. B.R.Pelly, *Thyristorised Converters and Cyclo-Converters*, Willey Eastern Publications.
6. F.E. Gentry and Etal , *Semiconductor Controlled Rectifiers* , PHI.

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit. The student shall answer any **FIVE** questions.

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Course Outcomes:

RADAR ENGINEERING (RE)
(Professional Elective for IV B.Tech ECE)

Scheme : 2010
Contact Periods: (3L+ 1T) / Week
Credits : 4

Internal Assessment : 30
End Exam Marks : 70
End Exam Duration : 3 hrs

Course Objectives:

- The objective of the course is to acquaint the knowledge about radar subsystems, their performance and key functions.
- This course also provides the in depth knowledge and issues related various tracking radars

Unit-I

Introduction to Radar: Description of basic radar system and its elements, Radar equation, Radar block diagram and operation, Radar frequencies, Application of radar.

Unit-II

The Radar Equation: Predictions of range performance, Minimum detectable signal, Receiver-noise and Signal to noise ratio. Probability of detection and false alarm, Radar cross-section of target. Transmitter power, Pulse repetition frequency and range ambiguities.

Unit-III

CW and FMCW Radar: Doppler effect, CW radar, FM CW radar, Multiple frequency CW radar.

Unit -IV

MTI and Pulse Doppler Radar: Description of operation, MTI radar with power amplifier transmitter, MTI radar with power oscillator transmitter, Delay line cancelers, Blind speeds, multiple or staggered PRFs, MTI radar using range gated Doppler filters, Limitations to MTI performance, Non-coherent MTI, Pulse Doppler radar.

Unit-V

Tracking Radar: Tracking with radar, Sequential lobbing, Conical scan, Monopulse amplitude Comparison and phase comparison tracking radar's, Tracking in range, Acquisition, Comparison of tracking radars.

Unit-VI

Radar Antennas: Antenna parameters, Parabolic reflector antennas, Cassigrain antennas.

Unit-VII

Radar Receivers: Radar receiver, Noise figure, Low noise front ends

Unit-VIII

Displays and Duplexers:, A-Scope, B-Scope and PPI radar displays, Duplexers and receiver protectors.

Text Books:

1. Skolnik, *Introduction to Radar Systems*, 2nd Edition, TMH
2. Skolnik, *Introduction to Radar Systems*, 3rd Edition, TMH.
3. Kulkarni M, *Microwave and Radar Engineering*, 1st Edition, Umesh Pub.

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit.
The student shall answer any **FIVE** questions.

Course Outcomes:

- Able to know about the all radar systems, design of radar systems and requirements of radar systems
- Able to characterize the performance of radar system

BIOMEDICAL INSTRUMENTATION (BMI)
(Professional Elective for IV B.Tech ECE)

Scheme : 2010
Contact Periods: (3L+ 1T) / Week
Credits : 4

Internal Assessment : 30
End Exam Marks : 70
End Exam Duration : 3 hrs

Course Objectives:

- To learn the physiology of the human body and the Instrumentation related to Biomedical Systems.

Unit-I

Introduction to Biomedical Instrumentation: Bioelectric-electrodes and physiological transducers: The age of biomedical engineering, development of biomedical instrumentation, Biometrics, introduction to the man-instrument system, Components of the man-instrument system, Physiological system of the body.

Unit-II

Introduction to Electrodes: Recording electrodes, electrodes of ECG, Microelectrodes pressure, Blood flow, Temperature transducers, Pulse and respiration sensors.

Unit-III

Recording And Monitoring Instruments: Electrocardiograph, Phono-cardiograph, Electroencephalograph, Electromyograph. Oscilloscope for biomedical measurement cardioscope, multichannel displays non-fade display systems. Blood pressure, Temperature, Respiration rate measurements.

Unit-IV

Monitoring Instruments: Cardiotocograph, methods of monitoring fetal heart rate, Fetal heart rate measurement.Interfacing computer with Medical instrumentation and other equipment, Computer aided ECG analysis, Computerized cathterisation laboratory, Computerised patient monitoring system.

Unit-V

Patient Safety, Measurement And Analysis Techniques : Physiological effects of electrical current, Shock hazards from electrical equipment, Leakage currents, Method of accident prevention.
Ultrasonic blood flow meters, Laser Doppler flow-meters, Coulter counter, Automatic recognition and differential counting of cells. Function of the kidneys, artificial kidney.

Unit-VI

Biotelemetry And Modern Imaging Systems: Introduction to biotelemetry, Physiological parameters adaptable to biotelemetry, The components of bio telemetry systems, Implantable units, Applications of telemetry in patient care. X-ray machine, X-ray computer topography.
Physics of ultrasonic waves, Medical ultrasound, A-scan, echocardiograph (M-Mode), B-scanner, real-time ultrasonic imaging system, Display devices for ultrasonic imaging, Biological effects of ultrasound.

Unit-VII

Therapeutic Equipment: Cardiac pacemakers: external, implantable, Programmable pacemakers, performance aspects of implantable pacemakers, Power sources for implantable pacemakers, Leads and electrodes.

Unit-VIII

Cardiac Defibrillators: DC-defibrillator, implantable defibrillators, and defibrillator analyzer. Laser application in Biomedical field.

Text Books:

1. Leslie Cromwell, Fred J. Weibell, Erich A. Pfeiffer, *Biomedical Instrumentation and Measurements*, PHI.
2. RS Khandpur, *Hand Book of Biomedical Instrumentation*, TMH.

Reference Books:

1. Cobbold, R.S.C, *Transducers of Biomedical Instruments: Principles and Applications*, John Wiley.
2. S.K. Guha, *Introduction to Biomedical Instrumentation*, Counsel of Scientific and Industrial Research.

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit. The student shall answer any **FIVE** questions.

Course Outcomes:

- To introduce the concepts of physiology and the Electrical Components of a Biomedical System.
- To discuss the measurement of physiological parameters.
- To understand the concepts of Imaging System and Telemetry ad the various Therapeutic Equipment's used in Medicine

MICROWAVE DEVICES AND INTEGRATED CIRCUITS (MIC)
(Professional Elective for IV B. Tech ECE)

Scheme : 2010
Contact Periods: (3L+ 1T) / Week
Credits : 4

Internal Assessment : 30
End Exam Marks : 70
End Exam Duration : 3 hrs

Course Objectives:

- The objective of the course is to provide the knowledge about Microwave transistors ,Tunnel diodes, Microwave Field Effect Transistors ,Transferred electron devices like Gunn, LSA, Inp and CdTe Avalanche Transit time devices, Microwave linear beam tubes, Microwave crossed field tubes, strip lines and microwave integrated circuits-fabrication

Unit-I

Microwave Transistors And Tunnel Diodes: Microwave bipolar transistors, Microwave tunnel diodes their physical structures, Operation principles & characteristics.

Unit-II

Microwave Field Effect Transistors: JFET, Metal semiconductor field effect transistors, High electron mobility transistors, MOSFETs, MOS transistors, Memory devices and CCDs.

Unit-III

Transferred Electron Devices: Gunn effect diodes, Ridley-Watkin Hilsum theory, Modes of separation, LSA diodes, InP and CdTe diodes, Microwave generation amplification.

Unit-IV

Avalanche Transit Time Devices: Read diode, IMPATT diodes, TRAPATT diodes, BARITT diodes, Parametric devices, Manley Rowe power relations, Parametric amplifiers.

Unit-V

Microwave Linear Beam Tubes (O Type): Conventional vacuum triodes, Tetrodes and pentodes, Klystrons, Multi cavity klystron amplifiers, Reflex klystrons, Helix travelling wave tubes, Coupled cavity travelling wave tubes.

Unit-VI

Micro Wave Crossed Field Tubes (M Type): Magnetron oscillators, Forward wave crossed field amplifier, Backward wave crossed field amplifier, Backward wave crossed field oscillator.

Unit-VII

Strip Lines And Microwave Integrated Circuits: Micro strip lines and coplanar strip lines, Shielded strip lines, Characteristic impedance and losses of above Substrates, Conductor, Dielectric and resistive materials.

Unit-VIII

Fabrication: Monolithic microwave integrated circuit growth, Fabrication techniques, MOSFET fabrication, Thin film formulation, Hybrid integrated circuit fabrication.

Text Books:

1. R.E. Collins, *Foundation of Microwave Engineering,* 2nd Edition, Wiley 2003.
2. Samuel Y.Liao, *Microwave devices and circuits*, 3rd Edition, PHI 2003.
3. K.C. Gupta, *Microwaves*, Wiley Eastern Ltd, 2001.

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit.
The student shall answer any **FIVE** questions.

Course Outcomes:

- Able to acquire the knowledge about all basic microwave devices
- Able to know about the all microwave tubes and integrated circuits

DETECTION & ESTIMATION OF SIGNALS (DES)
(Professional Elective for IV B.Tech)

Scheme: 2010
Contact Periods: (3L +1T)/week
Credits: 4

Internal Assessment : 30
End Exam Marks : 70
End Exam Duration : 3 hrs

Course Objectives:

- To detect the signals in the presence of noise.
- To find the power spectrum estimation for the non-stationary signals.

Unit-I

Introduction to Estimation Theory : Random Discrete-time Signals, Review of Random Processes, Filtered signals, Autocorrelation and Power spectral density, Sampling band limited random signals.

Unit-II

Properties of Estimators: Bias, Variance, Biased and Unbiased Estimators, Finding good estimators, Estimation of spectrum from finite duration observation of signals, Computation of Energy density Spectrum.

Unit-III

Classical (Non-parametric) Spectral Estimation: Periodogram, Averaged periodogram, Welch Spectral Estimator, Blackman-Tukey Spectral estimator, Performance characteristics of Non-parametric Power spectrum estimators.

Unit-IV

Modern (Parametric) Spectral Estimation: Time series models, Relationship between Auto-correlation and the model parameters, Auto Regressive Parameters by Yule-walker, Burg and Sequential estimation methods, Moving Average and Auto Regressive Moving Average models for power spectrum estimators

Unit-V

Statistical estimation of parameters: Minimum variance spectral estimator, Neyman Pearson Criterion for detection, Bay's estimator, Maximum entropy spectral estimator, Mean Square error criterion, Least Square method.

Unit-VI

Detection of Signals in Noise: Minimum probability of Error criterion, Neyman-Pearson criterion for Radar detection of constant and variable amplitude signals, Simple Problems thereon.

Unit-VII

Matched filter Receivers: Matched Filters, Optimum formulation, Detection of random signals, Simple problems thereon with multisampling cases.

Unit-VIII

Estimation of signals in Noise: Linear mean squared estimation, Non-linear estimates, Maximum a Posteriori and Maximum likelihood estimates of parameters of linear system, Simple problems thereon.

Text Books:

1. Alan V.Oppenheim and Ronald W.Schaffer, *Digital Signal Processing*, PHI, 2002
2. J.G.Proakis, *DSP Principles, Algorithms and Applications*, 3rd Edition,PHI, 2001
3. S.M. Kay, Modern Spectral Estimation Theory and Applications, PHI, 1998.

Reference Books :

1. Steven McKay, *Modern Spectral Estimation: Theory and Applications*, PHI,1998.
2. Shanmugam and Breipohl, *Detection of Signals in Noise and Estimation*, John Wiley & Sons,1985
3. Mischa Schwartz, L.Shaw, *Signal Processing: Discrete Sprectral Analysis, Detection and Estimation,*1975.
4. James L. Melsa and David L. Cohn, *Decision and Estimation Theory,* McGraw Hill,1975
5. Srinath, Rajasekaran & Viswanathan, *Introduction to statistical Signal processing with Applications*,PHI,1989.

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit. The student shall answer any **FIVE** questions.

Course Outcomes:

- Students are able to design optimal receivers in the presence of noisy environment.
- Students are able to estimate the power spectrum in Radar Systems and in any noise interference channels.

WAVELET TRANSFORM AND ITS APPLICATIONS (WTA)
(Professional Elective for IV B.Tech ECE)

Scheme : 2010
Contact Periods: (3L+ 1T) / Week
Credits : 4

Internal Assessment : 30
End Exam Marks : 70
End Exam Duration : 3 hrs

Course Objectives:

- The objective of the course is to provide the knowledge about Continuous Wavelet Transform & Discrete Wavelet Transform, Wavelet Filters, Embedded wavelet Coding, Lifting Schemes and Applications

Unit-I

Introduction: Vector spaces- properties-dot product- basis-dimension, orthogonality and orthonormality - relationship between vectors and signals- signal spaces-concept of convergence- Hilbert spaces for energy signals- Generalized Fourier Expansion.

Unit-II

Fourier Analysis: Fourier transform- Drawbacks of Fourier analysis- Short –time Fourier Transform (STFT) analysis- Spectrogram plot –phase- space plot in time-frequency plane, Time and frequency limitations, Uncertainty principle , Tiling of the Time-Frequency plane for STFT.

Unit-III

Continuous Wavelet Transform: Wavelet Transform-definition and properties – concept of scale and its relation with frequency – Continuous Wavelet Transform (CWT)- Scaling function and wavelet functions (Debauchis, Haar, Coilfet, Mexican, Hat, Sinc, Gaussian , Bi-orthogonal)- Tiling of time- scale plane for CWT.

Unit-IV

Discrete Wavelet Transform: Discrete wavelet transform (DWT)- Filter Bank and sub band coding principles. Multi-resolution analysis – Time scale difference equations for wavelets ad scaling functions.

Unit-V

Wavelet Filters: scale variation in the Discrete domain – Mallat's algorithm for DWT – Inverse DWT computation by filter banks- Multi- band Wavelet transforms.

Uint-VI

Embedded Wavelet Coding: Zero-tree Approach, SPIHT algorithm, EBCOT Algorithm.

Unit-VII

Lifting schemes: Wavelet transform using polyphase matrix factorization, Geometrical foundations of lifting scheme, Lifting scheme in the Z-domain, Mathmatical preliminaries for polyphase factorization

Unit-VIII

Applications: Sub-band coding of speech and music. Image compression using 2- D DWT, Fractal signal analysis, Denoising of signals.

Reference Books:

1. Strang G, Nguyen T, W*avelets and Filter Banks*, Wellesley Cambridge press.
2. Vetterli M, Kovacevic J, *Wavelets and Sub-band Coding*, Prentice Hall.
3. Mallat S, *Wavelet Signal Processing*, Academic Press.
4. Meyer Y.et. a, *Wavelet Toolbox Manual (MATLAB),* Mathworks inc.
5. Wornell GW, *Signal Processing with Fractals: A Wavelet Based Approach*, Prentice hall.
6. Rao. R.M and A.S Bopardikar, *Wavelet Transforms: Introduction to Theory andApplications*, Pearson Ed.
7. Jaideva C.Goswami and Andrew K.Chan, " Fundamentals of Wavelets" Wiley publishers, 2006 ISBN 81-265-1032-3 (Chapters 2 to 6)
8. K.P.Soman and K.I Ramachandran, " Insight into Wavelets – from theory to practice" PHI, Second edition,2008 ((ISBN 978-81-203-2902-7) (Chapter 7 & 8)

Note: The question paper shall consist of **EIGHT** questions, **ONE** question from each unit. The student shall answer any **FIVE** questions.

Course Outcomes:

- Students will able to know about all the wavelet filters and its applications related to image processing