

COURSE STRUCTURE AND DETAILED SYLLABUS

for

B.Tech Four Year Degree Course – I - IV year

in

**ELECTRICAL AND ELECTRONICS ENGINEERING
(EEE)**

(Applicable for the batches admitted from 2012-2013)



SREENIDHI INSTITUTE OF SCIENCE AND TECHNOLOGY
(An Autonomous Institution approved by UGC and affiliated to JNTUH)
Yamnapet, Ghatkesar, R.R.District-501 301.

B.Tech in Electrical & Electronics Engineering**COURSE STRUCTURE & SYLLABUS****I Year – I Semester**

S.No.	Subject Code	Subject	L	T	P/D	C	Max Marks	
							Int	Ext
1	121EN01	English – I	3	---	---	3	30	70
2	121MA01	Engineering Mathematics –I	3	2	---	3	30	70
3	121PH01	Engineering Physics – I	3	1	---	3	30	70
4	121CH01	Engineering Chemistry-I	2	1	---	2	30	70
5	121IT01	Computer Programming	3	1	---	3	30	70
6	121ME01	Engineering Drawing - 1	2	---	4	4	30	70
7	121EN71	English Language Lab - I	---	---	2	1	25	50
8	121PH71	Engineering Physics Lab – I	---	---	3/2	1	25	50
9	121CH71	Engineering Chemistry Lab	---	---	3/2	1	25	50
10	121IT71	Computer Programming Lab	---	---	3	2	25	50
11	121ME71	Engineering Workshop -I	---	---	3/2	1	25	50
12	121IT72	IT work shop – I	---	---	3/2	1	25	50
Total			16	5	15	25	330	720

I Year – II Semester

S.No.	Subject Code	Subject	L	T	P/D	C	Max Marks	
							Int	Ext
1	121EN02	English – II	2	1	---	2	30	70
2	121MA03	Engineering Mathematics – II	3	1	---	3	30	70
3	121PH02	Engineering Physics – II	3	1	---	3	30	70
4	121CS01	Data Structures and C ++	4	1	---	4	30	70
5	121ME02	Engineering Drawing – II	1	---	3	2	30	70
6	121CH02	Engineering Chemistry-II	2	1	---	2	30	70
7	121EE01	Circuits & Networks - I	4	1	---	4	30	70
8	121EN72	English Language Lab - II	---	---	2	1	25	50
9	121CS71	Data Structures and C ++ Lab	---	---	3	2	25	50
10	121ME72	Engineering Workshop – II	---	---	3/2	1	25	50
11	121PH72	Engineering Physics Lab- II	---	---	3/2	1	25	50
Total			19	6	11	25	310	690

II Year – I Semester

S.No.	Subject Code	Subject	L	T	P/D	C	Max Marks	
							Int	Ext
1	121MA05	Engineering Mathematics-III	3	2	---	3	30	70
2	121EC06	Switching Theory and Logic Design	3	1	---	3	30	70
3	121EC05	Electronic Devices and Circuits	3	2	---	3	30	70
4	121EE02	Electro Magnetic Fields	3	1	---	3	30	70
5	121EE03	Electrical Machines – I	3	2	---	3	30	70
6	121EE04	Circuits & Networks – II	4	1	---	4	30	70
7	121EN73	Functional and Communicative Written English	---	---	3	2	25	50
8	121EC71	Electronic Devices & Circuits Lab	---	---	3	2	25	50
9	121EE71	Electrical Circuits & Simulation Lab	---	---	3	2	25	50
Total			19	9	9	25	255	570

II Year – II Semester

S.No.	Subject Code	Subject	L	T	P/D	C	Max Marks	
							Int	Ext
1	121MA07	Probability & Statistics	3	1	---	3	30	70
2	121EE05	Electrical Machines – II	3	1	---	3	30	70
3	121EE06	Power System – I	3	1	---	3	30	70
4	121EE07	Control Systems	3	1	---	3	30	70
5	121EC33	Electronic Circuits	3	1	---	3	30	70
6	121ME04	Basic Mechanical Engineering	3	1	---	3	30	70
7	121EN74	Effective English Communication and Soft Skills	---	---	3	2	25	50
8	121EE72	Comprehensive Viva	---	---	---	1	---	50
9	121EE73	Electrical Machines Lab – I	---	---	3	2	25	50
10	121EC85	Electronic Circuits Lab	---	---	3	2	25	50
Total			18	6	9	25	255	620

B.Tech in Electrical & Electronics Engineering
COURSE STRUCTURE AND SYLLABUS (2012-13)

III Year – I Semester

S.No.	Subject Code	Subject	L	T	P/D	C	Max Marks	
							Int	Ext
1	3ZC01	Managerial Economics and Financial Analysis	3	1	---	3	30	70
2	3C513	Linear and Digital ICs	3	1	---	3	30	70
3		Open Elective – I	3	--	--	3	30	70
4	3A508	Electrical Machines – III	3	1	--	3	30	70
5	3A509	Power Electronics	3	1	--	3	30	70
6	3A510	Power Systems – II	3	1	--	3	30	70
7	3HC76	Quantitative Aptitude	---	--	2	1	25	50
8	3A574	Group Project	--	--	3	1	25	50
9	3C573	Linear and Digital IC Applications Lab	--	--	4	2	25	50
10	3A575	Control Systems and Simulation Lab	--	--	4	2	25	50
11	3A585	Technical Paper Writing & Seminar-I	--	--	2	1	25	--
Total			18	5	15	25	305	620

Open Elective – I

3CC08	Signals And Systems
3EC03	Java Programming
3DC01	Discrete Structures And Graph Theory
3DC07	VLSI Design
3DC06	Embedded And Real Time Systems
3B515	Product and Service design
3ZC04	Entrepreneurship

III Year – II Semester

S.No.	Subject Code	Subject	L	T	P/D	C	Max Marks	
							Int	Ext
1	3ZC02	Management Science	3	1	--	3	30	70
2	3D605	Microprocessor & Microcontrollers	3	1	--	3	30	70
3	3DC03	Computer Organization	3	1	--	3	30	70
4	3A611	Power Systems – III	3	1	---	3	30	70
5	3A612	Measurements & Instrumentation	3	1	--	3	30	70
6		Open Elective – II	3	--	--	3	30	70
7	3HC77	Logical Reasoning	---	--	2	1	25	50
8	3A676	Comprehensive Viva –II	--	--	--	1	--	50
9	3A677	Electrical Machines Lab – II	--	--	4	2	25	50
10	3A678	Power Electronics and Simulation Lab	--	--	4	2	25	50
11	3A686	Technical Paper Writing & Seminar-II	--	--	2	1	25	--
Total			18	5	12	25	280	620

Open Elective – II

3HC51	Basic Spanish Language
3ZC03	Banking Operations, Insurance and Risk Management
3HC41	Basic French Language
3HC46	Basic German Language
3ZC05	General Management and Entrepreneurship
3ZC07	Fundamentals of Disaster Management
3ZC12	Project Management and Finance

***Industry Oriented Mini Project will be conducted by all students in summer vacation of III / IV B.Tech, II – Semester for a period of One Month. The report must be submitted in IV / IV B.Tech I –Semester and will have to be defended. Marks allotted are “75” and Two Credits are provided.

IV Year – I Semester

S.No.	Subject Code	Subject	L	T	P/D	C	Max Marks	
							INT	EXT
1	3GC33	Culture, Values, Professional Ethics & IPR	2	1	---	2	30	70
2	3A714	Power Station Practice	4	0	--	4	30	70
3	3A715	Non conventional Sources of Energy	3	1	--	3	30	70
4	3A713	Power Semi Conductor Drives	3	1	--	3	30	70
5		Professional Elective – I	3	1	--	3	30	70
6	3GC06	Environmental Studies	3	1	---	3	30	70
7	3A779	Project Phase –I	--	--	2	1	50	--
8	3A780	Industry Oriented Mini Project	--	--	--	2	25	50
9	3A781	Electrical workshop	--	--	4	2	25	50
10	3DC71	Microprocessor & Microcontrollers Lab	--	--	4	2	25	50
11	3A782	Measurements & Instrumentation Lab	--	--	4	2	25	50
12	3A787	Technical Paper Writing & Seminar-III	--	--	2	1	25	--
Total			18	5	16	28	355	620

Professional Elective –I

3A716	Utilization of Electrical Energy
3A717	High Voltage Engineering
3CC15	Digital Signal Processing
3A722	Electrical Machine Design

IV Year – II Semester

S.No.	Subject Code	Subject	L	T	P/D	C	Max Marks	
							Int	Ext
1	3A820	Electrical Distribution Systems	3	1	---	3	30	70
2		Professional Elective – II	3	1	--	3	30	70
3		Professional Elective – III	4	1	---	4	30	70
4	3A883	Project Phase –II	---	---	15	10	50	150
5	3A884	Comprehensive Viva-III	---	---	---	1	---	50
6	3A888	Technical Paper Writing & Seminar-IV	---	---	2	1	25	---
Total			10	3	17	22	165	410

Profession Elective - II

3A818	Optimization Techniques
3FC03	Data Base Management Systems
3FC10	Neural Networks & Fuzzy Logic

Professional Elective – III

3A819	Flexible AC Transmission Systems
3C834	Communication Theory
3A821	High Voltage DC Transmission
3A823	Control of Electric Drives

L - Lectures; T - Tutorial; P/D - Practical / Drawing; C – Credit

Code: 121EN01

**I Year B.Tech – I Sem
ENGLISH – I**

(Communicative Approaches)

(Common to all Branches)

L	T	P/D	C
3	-	-	3

UNIT I: NOBLE THOUGHT

- | | | |
|----------------------|---|--|
| 1. Reading | : | The Last Leaf – O. Henry |
| 2. Writing | : | Paragraph writing |
| 3. Listening | : | Listening for sounds |
| 4. Speaking | : | Greeting, taking leave and introducing |
| 5. Grammar | : | Naming words |
| 6. Vocabulary | : | Homonyms, homophones, homographs, synonyms and
Antonyms |

UNIT II: BIOGRAPHY

- | | | |
|----------------------|---|------------------------------------|
| 1. Reading | : | Sri C.V. Raman- Shubashree Desikan |
| 2. Listening | : | Listening for words |
| 3. Speaking | : | Making requests |
| 4. Grammar | : | Naming words specific (Part I) |
| 5. Vocabulary | : | Word Formation |

UNIT III: HUMAN INTEREST

- | | | |
|----------------------|---|---------------------------------------|
| 1. Reading | : | The Connoisseur- Nergis Dalal |
| 2. Writing | : | Summarizing |
| 3. Listening | : | Listening for word stress |
| 4. Speaking | : | Apologizing and inviting |
| 5. Grammar | : | Making naming words specific (part 2) |
| 6. Vocabulary | : | Collocations |

UNIT IV: DISASTER MANAGEMENT

- | | | |
|---------------------|---|---|
| 1. Reading | : | The Cuddalore Experience-Anu George |
| 2. Writing | : | Basics of Essay Writing |
| 3. Listening | : | Listening for theme |
| 4. Speaking | : | Congratulating, offering sympathy, condolences
and making complaints |
| 5. Grammar | : | Tenses |

UNIT V: HUMOUR

1. **Reading** : The Luncheon – Somerset Maugham
2. **Writing** : Note making
3. **Listening** : Listening for details and taking notes
4. **Speaking** : Interview skills
5. **Grammar** : Adverbials and modal verbs

UNIT VI: Outlook

1. **Reading** : Indian Crowds – Nirad C. Choudhary
2. **Writing** : Information transfer
3. **Listening** : Listening to announcements and directions
4. **Speaking** : Making presentations
5. **Grammar** : Conjunctions and prepositions
6. **Vocabulary** : Business vocabulary

Text Books:

1. Enjoying Everyday English: A Rama Krishna Rao, Sangam Books, HYD.

Reference Books:

1. Business Vocabulary In Use -Bill Mascull, Cambridge University Press.
2. How to build a better vocabulary –Nurnberg Maxwell & Morris Rosenblum: Grand Central Publishers
3. How to read better and faster: Norman Lewis, W.R.Goyal Publishers, New Delhi

Code: 121MA01

I Year B.Tech – I Sem
ENGINEERING MATHEMATICS –I
 (Common to all branches except Bio-Technology)

L	T	P/D	C
3	2	0	3

UNIT-I

Sequences and series: Sequences and series- Convergence and divergence – Comparison test – integral test – Cauchy root test – Ratio test– Raabe’s test – Log test. Mean value theorems – Taylor’s and Maclaurin’s theorems without remainders and Taylor’s series expansions.

UNIT-II**Functions of several variables**

Functions of several variables, total differentiation, Jacobians and its properties, Maxima and Minima of functions of several variables (two and three variables), Lagrange’s method of multipliers.

UNIT-III**Matrix Theory-I**

Elementary Transformations, rank of a matrix –Echelon form, normal form, Inverse of a matrix using elementary operations, Consistency and solutions of systems of linear equations using Gauss elimination. Linear dependence and independence of vectors.

UNIT-IV**Matrix Theory-II**

Characteristic roots and vectors of a matrix, properties of Eigen values and Eigen Vectors, Caley-Hamilton theorem and its applications, Diagonalization of a matrix.

UNIT-V**Multiple integrals**

Double and triple integrals, change of order of integration and change of variables. Length of curves. Area of regions and Volume of solid of revolution

UNIT-VI**Vector Calculus:**

Scalar and vector fields , vector differentiation, level surfaces, directional derivative, gradient of a scalar field, divergence and curl of a vector field, Laplacian operator and related properties.
 Line and surface integrals, verification of problems on Green’s theorem in plane, Gauss-Divergence theorem, Stoke’s theorem.

TEXT BOOKS:

1. Advanced Engineering Mathematics, S. R. K. Iyengar and R.K. Jain, Narosa Publishing House, London, 2002.
2. Higher Engineering Mathematics, B.S. Grewal, Khanna Publications, New Delhi.
3. Engineering Mathematics, B. V. Ramana, Tata McGraw Hill Publishing Company Ltd.

REFERENCE BOOKS:

1. A text Book of KREYSZIG’s Engineering Mathematics, Dr. A. Ramakrishna Prasad, Wiley Publications.
2. A text book of Engineering Mathematics, Dr.M. Venkata Krishna, G.Shankar Rao,Galgotia Publications,New Delhi

Code: 121PH01

I Year B.Tech – I Sem
ENGINEERING PHYSICS – 1
 (Common to all branches)

L	T	P/D	C
3	1	--	3

UNIT - I

Crystallography and Crystal Structures: Space Lattice, Unit Cell, Lattice Parameters, Crystal Systems, Bravais Lattices, Miller Indices, Crystal Planes and Directions, Inter Planar Spacing of Orthogonal Crystal Systems, Atomic Radius, Co-ordination Number and Packing Factor of SC, BCC, FCC, and hcp Structures.

UNIT-II

X-ray Diffraction: Basic Principles, Bragg's Law, Powder Method, Applications of X-ray Diffraction.

Defects in Crystals: Point Defects: Vacancies, Substitutional, Interstitial, Frenkel and Schottky Defects-Calculation of concentration, Qualitative treatment of line (Edge and Screw Dislocations) Defects, Burger's Vector.

UNIT- III

Elements of Statistical Mechanics: Phase space, Ensemble, Difference between micro, canonical & grand canonical ensemble, Qualitative explanation of Maxwell - Boltzman Statistics, Bose – Einstein Statistics, and Fermi – Dirac Statistics, Density of states quantitative treatment.

UNIT-IV

Principles of Quantum Mechanics: Waves and Particles, de Broglie Hypothesis , Matter Waves, Davisson and Germer's Experiment, G. P. Thomson Experiment, Heisenberg's Uncertainty Principle, Schrödinger's Time Independent Wave Equation -Physical Significance of the Wave Function -Particle in One Dimensional Potential Box.

UNIT-V

Free electron theory of Metals: Classical free electron theory (Drunde and Lorentz), Electrical conductivity of a metals, Relaxation time, Collision time and mean free path, Success of classical free electron theory, Breakdown of free electron theory, Fermi – Dirac distribution function- variation with temperature, The quantum free electron theory.

UNIT-VI

Band Theory of Solids: Bloch Theorem, Kronig-Penny Model (Qualitative Treatment), E-K curve ,velocity of , \bar{e} point of inflection, effective mass of an electron and its significance, Origin of Energy Band Formation in Solids, Classification of Materials into Conductors, Semi Conductors & Insulators.

TEXT BOOKS:

1. Engineering Physics, P K Palanisamy, Sitech Publications

REFERENCE BOOKS:

1. Introduction to Solid State Physics, Charles Kittel, John Wiley Publisher
2. Solid State Physics, Neil W. Ashcroft, N. David Mermin,, Thomson Publisher,
3. Statistical Mechanics, Donald Allan McQuarrie, University Science Books Publisher, California
4. Statistical Mechanics, Sathya Prakash, Pragathi Prakashan Publisher
5. Quantum Mechanics by G. Aruldas
6. Applied Physics, M Chandrashekar and P Appla Naidu, VGS Book Links

Code: 121CH01

I Year B.Tech – I Sem
ENGINEERING CHEMISTRY – I
(Common to all Branches)

L T P/D C

UNIT-I: WATER TECHNOLOGY-I

Introduction ,Effect of water on Rocks and Minerals, Types of impurities in Water, Hardness of Water- Temporary and permanent hardness. Units and Inter conversion of Units. Estimation of Hardness by EDTA Method. Problems on Temporary and permanent Hardness.Disadvantages of Hard Water. Portable water, Methods of Treatment of Water for Domestic purpose-Sedimentation, Coagulation, Filtration, Diinfection-Chlorination, Ozonization. Reverse osmosis

UNIT-II: WATER TECHNOLOGY-II

Water for Industrial purpose –water for steam making-Boiler Troubles-Carry over-Priming and foaming, Boiler Corrosion, Scales and Sludges, Caustic Embrittlement. Water Treatment:-Internal Treatment – colloidal, phosphate Calgon, Carbonate, Sodium aluminate conditioning of Water.External Treatment-Lime soda Process,Zeolite Process,Ion –Exchange Process,-Numerical Problems.

UNIT III: ELECTROCHEMISTRY

Conductance-types, Electrolytic conductance-specific, equivalent and molar conductance, ionic conductance, ionic mobilities, Kohlrausch's law and its applications. EMF: Galvanic Cells, types of Electrodes, Reference Electrode (SCE), Redox electrode (Quinhydrone electrode), Ion Selective Electrodes (Glass Electrode) Nernst equation and its applications, Potentiometric titrations, Numerical problems.

UNIT IV: BATTERIES

Cell and Battery, Primary and secondary cells, (Ni-Cd cell, Lithium ion cells, lead-Acid cell,). Applications of batteries, Fuel cells – Hydrogen – Oxygen fuel cell, Advantages of fuel cells.

UNIT V: SCIENCE OF CORROSION

Definition, Examples – Types of Corrosion: Theories of Corrosion and Mechanism – Dry Corrosion, (Direct Chemical attack), Wet Corrosion, (Electro Chemical Theory) Principles of Corrosion, Galvanic Series, Galvanic Corrosion, Concentration Cell Corrosion. Factors influencing Corrosion Control of Corrosion – Proper Design. Use of pure metal and metal alloys, Passivity, Cathodic Protection – Sacrificial anode and Impressed Current Modifying the Environment, use of Inhibitors.

UNIT VI: PROTECTIVE COATING AND METHODS THEIR APPLICATIONS ON METALS

Surface Preparation: (1) Solvent Cleaning (2) Alkali Cleaning (3) Pickling and Etching (4) Sand Blasting (5) Mechanical Cleaning. Types of protective Coating: Metallic Coatings – Anodic Coatings, Galvanization, Cathodic Coatings – Tinning, Metal Cladding, Electroplating Ex: Chromium Plating, Metal Spraying, Cementation Sharadizing, Colourizing, Chromizing, Chemical Conversion Coating: (1) Phosphate (2) Chromate (3) Anodized Coatings.

Organic Coatings: Paints – Constituents and their functions

TEXT BOOKS:

1. Engineering Chemistry: Dr.M.Tirumala Chary and Dr.E.Laxminarayana, Scitech publications.
2. Engineering Chemistry: P.K. Jain and M.K. Jain, Dhanpathrai Publications – 14th Edition

REFERENCE BOOKS:

1. Essentials of Physical chemistry; Baul & Tuli; S. Chand Publications.
2. Text of Engineering Chemistry by S.S. Dara & Mukkati S. Chand & Co,New Delhi(2006)
3. Chemistry of Engineering Materials by CV Agarwal,C.P Murthy, A.Naidu, BS Publications.
4. Engineering Chemistry by R. P. Mani, K. N. Krishna B. Rama Devi Cengage Learning New Delhi (2010).
5. Engineering Chemistry by Shiva Shnakar Tata McGraw Hill (2010).

Code: 121IT01

I Year B.Tech – I Sem
COMPUTER PROGRAMMING
(Common to all Branches)

L	T	P	C
3	1	0	3

UNIT – I- Syllabus

Computer fundamentals – Computer Systems, Computer Hardware, Computer Software, Computer Environments – Personal Computing Environment, Time-sharing Environment, Client/Server Environment, Distributed Computing, Computer Languages – Machine Languages, Symbolic Languages, High-Level Languages, Creating and running programs – Writing and Editing, compiling, linking, and executing programs, System Development – SDLC. (As in chapter 1 of Text Book 1)

Problem solving Techniques – Algorithms, pseudo code, flowcharts – Simple illustrations and domain problems like: Sum of digits of a number, Nature of quadratic equations, Income Tax Problem, Standard Deviation, Fibonacci sequence and golden ratio, Towers of Hanoi.

Objective:

By undergoing this unit, the student will be able to:

1. Define Computer Systems. Distinguish between Computer Hardware and Software. understand different kinds of Computer Languages. Acquaint with Problem solving Techniques through Algorithms, pseudo code, flowcharts.

UNIT – II- Syllabus

C fundamentals – History of C Language, Features of C, Structure of C, Character set, identifiers, constants, variables and keywords.

Simple data types – void, integral, floating-point – memory allocation for these types. Type qualifier const.

Operators – Unary, binary and ternary, precedence and association rules among operators.

Expressions – Primary expressions, post-fix expressions, pre-fix expressions, unary expressions, binary expressions, evaluating expressions, type conversions, statements.

Decision control structures – if..else, dangling else, switch statement.

Repetitive control structures – while, do..while, for, break and continue statements, Nested structures.

Objective:

By undergoing this unit, the student will be able to:

1. Define Simple data types, operators and expressions.
2. Understand and apply Decision control structures: if ... else, dangling else, switch statement. and apply Repetitive control structures: while, do ... while, for, break and continue statements, Nested structures.

UNIT – III- Syllabus

Arrays – Definition, initialization, strings as character arrays, two dimensional and multidimensional arrays, and variable length arrays.

Pointers – Definition, Pointer variable, Pointer to a pointer, Memory mapping, arithmetic operations on pointers, relationship between arrays and pointers, pointers as arguments and return type of a function, pointers to a function, array of pointers and pointers to arrays, dynamic memory allocation.

Strings – Input output functions, string handling functions.

Objective:

By undergoing this unit, the student will be able to:

1. Define, understand, and apply arrays and pointers. Explain the relationship between arrays and pointers. pointers with functions. Understand the concept of dynamic memory allocation and apply it to solve problems. Handle the strings: Input output functions, string handling functions.

UNIT – IV- Syllabus

Functions – Function definition, arguments, return value, prototype, arguments and parameters.

Parameter passing – Call by value and call by reference, passing arrays as arguments to functions.

Recursive functions – Definition, examples, advantages and disadvantages.

Macros – Definition, examples, comparison with functions.

Objective:

By undergoing this unit, the student will be able to:

1. Define and understand modularity. Differentiate between Call by value and call by reference. Able to pass arrays as arguments to functions. Understand the use of recursion.

UNIT – V- Syllabus

Structures – Declaring a structure, array of structures, nested structures, unions, passing structures as arguments to a function and structure as a return type of a function.

Files – Data Organization, file operations, file opening modes, creating, storing, retrieving, appending, editing, copying files, Examples illustrating counting characters, tabs, spaces, string (line) I/O in files, text files and binary files, direct reading from and writing structures to files, command line arguments, error handling functions in files random access files.

Objective:

By undergoing this unit, the student will be able to:

1. Define and use structures, unions Understand data organization, file operations, Accessing file data.

UNIT – VI- Syllabus

Applications – Case study of simple bank transactions and program development.

Preprocessor directives – Macro expansion, file inclusion, condition compilation, miscellaneous directives.

Linked Lists & Dynamic memory allocation – Constructing a linked list, adding nodes to, inserting nodes into, deleting nodes from, modifying data in nodes of a linked list.

Objective:

By undergoing this unit, the student will be able to:

1. Undertake case study of simple bank transactions Understand Preprocessor directives: Construct a linked list, and its operations.

TEXT BOOKS:

1. Computer science, a structured programming approach using C, B.A. Forouzan and R.F. Gilberg, Third edition, Thomson.

REFERENCES:

1. The C Programming Language, B.W. Kernighan, Dennis M.Ritchie, PHI/Pearson Education.
2. Let us C - Yashwanth P. Kanetkar 8th edition BPB publications.
3. Computer programming for teens - Mary Farrell.

I Year B.Tech – I Sem
Code: 121ME01

ENGINEERING DRAWING – I
(Common to all branches)

L	T	P/D	C
2	---	4	4

UNIT – I

Introduction to Engineering Drawing: Drawing Instruments and their uses, types of lines, use of pencils, Lettering, Rules of dimensioning.

Construction of polygons: Inscription and superscription of polygons given the diameter of circle.

Introduction To Scales (Theory Only): Scales Used In Engineering Practice and Concept Of Representative Fraction

Curves used in Engineering Practice and their Constructions:

Conic Sections including Rectangular Hyperbola - General method only.

UNIT – II

Drawing of Projections or Views (Orthographic Projection in First Angle Projection Only): Principles of Orthographic Projections – Conventions – First and Third Angle Projections, Projection of Points, Projection of Lines - inclined to both planes, True lengths, traces.

UNIT – III

Projections of Planes: Projections of regular Planes, traces, Oblique planes, Introduction to Auxiliary planes

UNIT –IV

Projections of Solids: Projections of Regular Solids – Regular Polyhedra, solids of revolution, Axis inclined to both planes.

UNIT –V

Sections of Solids: Sections and Sectional views of Right Regular Solids – Prism, Cylinder, Pyramid, Cone – Auxiliary views

UNIT –VI

Intersection of Similar and Dis-similar Solids: Line method, Cutting plane method, Intersection of Prism Vs Prism, Cylinders Vs Cylinder (Under Similar category) and Cylinder Vs Prism (Under Dis-similar category)

TEXT BOOKS:

1. Engineering Drawing, N.D. Bhatt / Charotar publishers
2. Engineering Drawing, K.L.Narayana and Kannaiah / Sciotech publishers.

REFERENCES:

1. Engineering Drawing, K.Venugopal/G.Sreekanjana, New Age International Publishers.
2. Engineering Drawing, B.V.R.Gupta, M.Raja Roy/I.K.International Publishing House,

CODE: 121EN71

I Year B.Tech – I Sem
ENGLISH LANGUAGE LAB – I
(Common to all branches)

L T P/D C
- - 2 1

The Language Lab focuses on the production and practice of sounds of language and familiarizes the students with the use of English in everyday situations and contexts.

Objectives:

1. To expose the students to a variety of self-instructional, learner-friendly modes of language learning.
2. To help the students cultivate the habit of listening and learning the sounds of English language i.e. phonetics from the computer monitor, thus preparing them for the correct pronunciation and language fluency.
3. To train them to converse effectively in different situations of life.
4. To help the students in producing effective oral presentations, and to enable them for extempore.

Syllabus:

The following course content is prescribed for the English Language Laboratory sessions.

1. Introduction to the Sounds of English – Vowels, Diphthongs & Consonants.
2. Situational Dialogues/Role Play
3. Oral Presentations-Prepared and Extempore
4. 'Just A Minute' Sessions (JAM)
5. Describing Objects/Situations/People
6. Information Transfer

Minimum Lab Requirements

The English Language Lab shall have two parts.

- i) The Computer aided Language Lab for 60 students with 60 systems, one master console. LAN facility and English language software for self-study by learners.
- ii) The Communication Skills Lab with movable chairs and audio-vusyak aids with a P.A. System, a T.V., a digital stereo-audio & video system and camcorder etc.

System Requirement (Hardware component)

Computer network with LAN with minimum 60 multimedia systems with the following specifications:

- 1) P-IV Processor
 - a) Speed – 2.8 GHZ
 - b) RAM -512 MB Minimum
 - c) Hard Disk – 80 GB
- 2) Headphones of High quality

Suggested Software:

- * Pro Power Pronunciation Software
- * Hi Class system Monitoring Software.
- * A.P.State Council of Higher Education Software (Foundation Course in communication skills)
- * Face to Face elementary and Pre –intermediate CDs.
- * Cambridge Advanced Learners' English Dictionary with CD
- * Learn to speak English book + CD set. (Set of 4 CDs)
- * Mastering English (CD).
- * DOKI English CD

REFERENCES

1. English Conversation Practice by Grant Taylor, Tata Mc.Graw Hill
2. Speaking Effectively, Cambridge University Press
3. A text book of English Phonetics for Indian Students by T. Balasubramanian Mac Millan

Code: 121PH71

I Year B.Tech – I Sem
ENGINEERING PHYSICS LAB –I
(Common to all branches)

L	T	P/D	C
-	-	3/2	1

1. Calculation of error – Error estimation
2. Determination of wavelength of a given laser Source of light by using diffraction grating
3. To find frequency of tuning fork – Melde’s experiment
4. To find the frequency of ac signal generator – A c Sonometer
5. R C Network
6. L C R series and parallel resonance
7. Determination of rigidity modulus of a given wire – Torsional pendulum
8. Plank’s constant
9. Determination of the acceleration due to gravity by compound pendulum.

Note: Any six of the above nine Experiments are to be conducted.

Code: 121CH71

I Year B.Tech – I Sem
ENGINEERING CHEMISTRY LAB
(Common to all branches)

L	T	P	C
-	-	3/2	1

Minimum any Six of the following Experiments

1. Estimation of MnO_2 in Pyrolusite.
2. Estimation of Hardness of water.
3. Estimation of Mn^{+2} / Cu^{+2} ions by colorimetry.
4. Estimation of acid by conductometric titrations.
5. Estimation of acid by potentiometric titrations.
6. Determination of viscosity.
7. a) Preparation of Aspirin
b) Preparation of Polymer (Thiokol rubber).
8. Determination of Flash and Fire point of a fuel using Abel's / Pensky – Martin's Apparatus.
9. Determination of Calorific value of a solid fuel by Bomb Colorimeter.
10. Grease n penetration Test.

I Year B.Tech – I Sem

Code: 121IT71

COMPUTER PROGRAMMING LAB

(Common to all branches)

L	T	P/D	C
-	-	3	2

1. Unit I (Cycle 1)

- Write an algorithm for converting a given Celsius temperature to its equivalent Fahrenheit temperature and draw a flowchart.
- Write an algorithm to find the largest of three given numbers and draw a flowchart.
- Write an algorithm and draw a flowchart for finding the roots and nature of roots of a quadratic equation, given its coefficients.
- Write an algorithm and flowchart for finding the first n Fibonacci numbers, give n.

2. Unit II (Cycle 2)

- Write an algorithm, flowchart, and C program for:
 - Finding the area and circumference of a circle of given radius.
 - Finding the volume of a sphere of given radius.
 - Finding the lateral surface area of a right circular cone of given base radius and height.
 - Finding selling price of an item, given its cost price and profit percent.
 - Finding the interest on a given principal for a given period of time at a given rate of per year.
- Write a C program to display all the sizes of data types in C.
- Write a C program to display a given decimal integer into an equivalent octal number and hexadecimal number using %o and %x in printf function.

3. Unit II (Cycle 3)

- Write a C program to find the roots and nature of the roots of a quadratic equation, given its coefficients.
- Write a C program for finding the largest of three given numbers.
- A salesman gets a commission of 5% on the sales he makes if his sales is below Rs.5000/- and a commission of 8% on the sales that exceeds Rs.5000/- together with Rs.250/-. Write an algorithm or a flowchart and develop C program for computing the commission of the salesman, given his sales.

4. Unit III (Cycle 4)

- Write three C programs to print a multiplication table for a given number using while, do-while, and for loops.
- Write a C program to compute the sum of:
 - $1+x+x^2+x^3+\dots+x^n$, given x and n.
 - $1! + 2! + 3! + \dots + n!$, given n.
 - $1 - x^2/2! + x^4/4! - x^6/6! + x^8/8! - x^{10}/10! + \dots$ to n terms where the nth term becomes less than 0.0001.

5. Unit III (Cycle 5)

- Write a C program in the menu driven style to perform the operations +, -, *, /, % between two given integers.
- Write a C program to find the largest and the least of some numbers given by the user.
- Write a C program to find the sum of the digits of a positive integer.

6. Unit III (Cycle 6)

- Write C functions for the following:
 - A function that takes an integer n as argument and returns 1 if it is a prime number and 0 otherwise.

2. A function that takes a real number x and a positive integer n as arguments and returns x^n .
3. A function that takes a positive integer n as an argument and returns the n^{th} Fibonacci number.
- b. Using recursion write C functions for the following:
 1. Factorial of a non-negative integer n .
 2. Number of combinations of n things taken r at a time.
 3. Greatest Common Divisor of two integers.
 4. Least Common Multiple of two integers.
7. **Unit III (Cycle 7)**
 1. Write a menu driven style program to compute the above functions (cycle 6) on the choice of the function given by the user.
 2. Define macros for the following and use them to find sum of the squares of the minimum and maximum of two given numbers.
 1. Larger of two numbers.
 2. Smaller of two numbers.
 3. Sum of the squares of two numbers.
 3. Write a program to generate Pascal's triangle.
 4. Write a program to count the number of letters, words, and lines in a given text.
8. **Unit IV (Cycle 8)**
 - a. Write a program to store the numbers given by the user in an array, and then to find the mean, deviations of the given values from the mean, and variance.
 - b. Write a C program to initially store user given numbers in an array, display them and then to insert a given number at a given location and to delete a number at a given location.
 - c. Write a program to store user given numbers in an array and find the locations of minimum and maximum values in the array and swap them and display the resulting array.
9. **Unit IV (Cycle 9)**
 - a. Write a C program to implement the operations of matrices – addition, subtraction, multiplication.
 - b. Write a program to find whether a given matrix is symmetric, lower triangular, upper triangular, diagonal, scalar, or unit matrix.
10. **Unit V (Cycle 10)**
 - a. Write a function to swap two numbers.
 - b. Write a function to compute area and circumference of a circle, having area and circumference as pointer arguments and radius as an ordinary argument.
11. **Unit VI (Cycle 11)**
 - a. Define a structure for complex number. Write functions on complex numbers (addition, subtraction, absolute value, multiplication, division, complex conjugate) and implement them in a menu driven style.
 - b. Define a structure point. Write a program to find the distance between two points.
 - c. Define a structure student having members roll no., name, class, section, marks. Create an array of 10 students give the data and find the average marks, section-wise.
12. **Unit VI (Cycle 12)**
 - a. Write a program to:
 1. Create a file by the name given by the user or by command line argument and add the text given by the user to that file.
 2. Open the file created above and display the contents of the file.
 3. Copy a file into some other file, file names given by the user or by command line arguments.
 4. Append a user mentioned file to another file.
 5. Reverse the first n characters of a file.

Code: 121ME71

I Year B.Tech – I Sem
ENGINEERING WORKSHOP – I
(Common to all branches)
(ALTERNATE WEEKS)

L	T	P/D	C
-	-	3/2	1

1. House Wiring

To connect the Tube Light as per circuit diagram
To connect the Calling Bell as per circuit diagram

2. Home Appliances

Practice of disassembly and assembly of various home appliances (such as Fans, Mixers, Washing machines etc.,

3. Welding

Preparation and welding of Lap Joint
Preparation and welding of Butt Joint

Code: 121IT72

**I Year B.Tech – I Sem
IT WORKSHOP – I
(Common to all branches)
(ALTERNATE WEEKS)**

L	T	P/D	C
-	-	3/2	1

Week 1:

Introduction to Computer: Identify the peripherals of a computer, components/peripherals in a CPU & its functions. Introduction to the types of Operating System, Install computer with dual boot operating system (windows, Linux with PowerPoint presentation). Comparison of types of OS in different platform.

Week 2: Assembling and Deassembling Praticals

Week 3:

Introduction to Microsoft Windows XP: Software and data, Components of Desktop, Working with windows

Week 4:

Getting Started with Microsoft Windows XP: Using the Start Menu, Obainting Help on Windows Changing Setting, Using Applications in Windows, Shutting Down Windows

Week 5:

Introduction to Linux Operating system, Linux Commands, DOS commands

Week 6:

Install computer applications in Linux and windows.

Software and hardware trouble shoot, personal computer security settings and application software of the system.

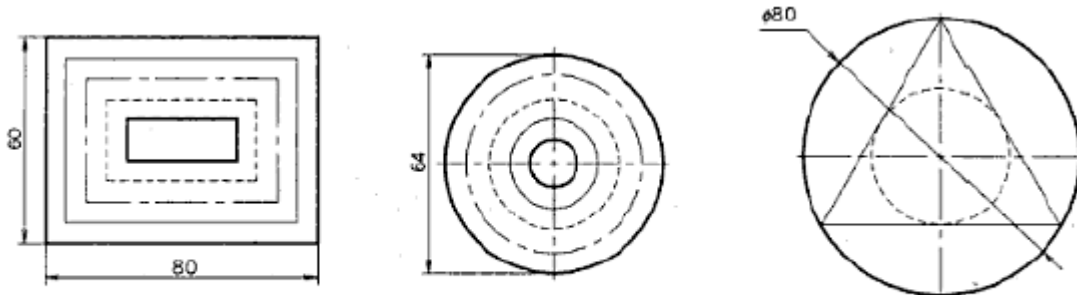
Cyber Ethics: Access websites and email, effectively and securely browse (banksites, https webpages) and share the data, categories of websites (.com, .in, .edu, .org).

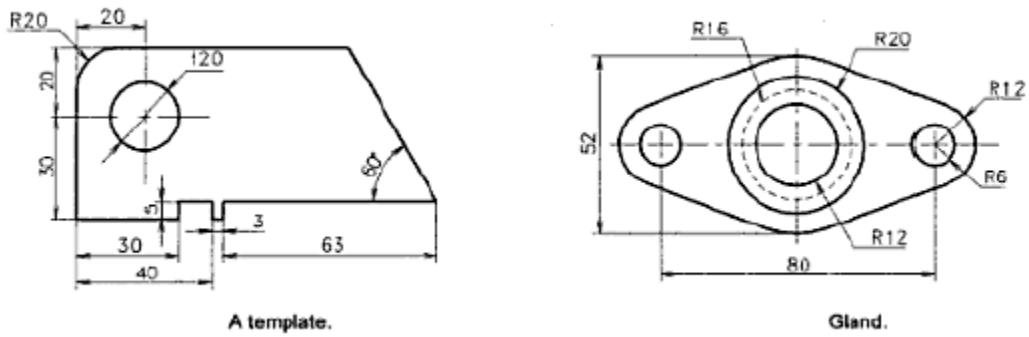
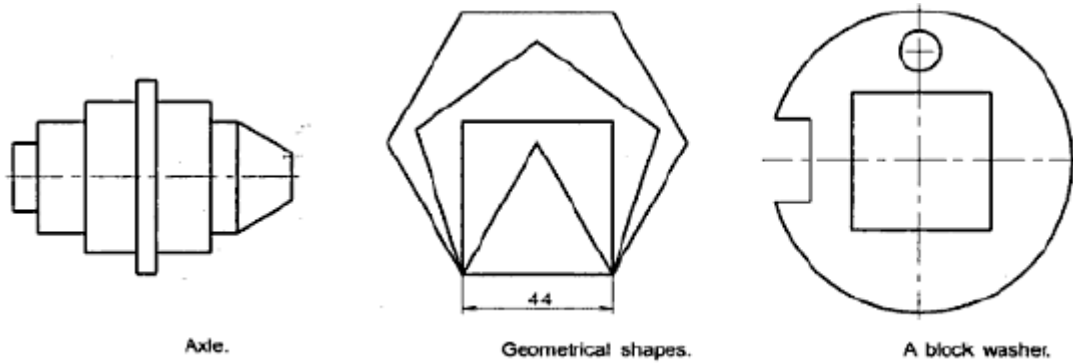
Week 7: Drafting of 2D Figures:

Draw commands – Line, Rectangle, Circle, Arc, Polygon, Ellipse, Hatch, text – Various methods of using these commands.

Modify commands – Erase, Move, Rotate, Copy object, Offset, Array, Mirror, Break, Trim, Extend, Stretch, Chamfer, Fllet, Scale etc.,

Dimensioning commands –Dimensioning of lines, arcs

Simple Exercises on drawing using AUTOCAD:



TEXT BOOK:

1. "Comdex Information Technology Course Kit" by Vikas Gupta, Dreamtech Press
2. Engineering Drawing with AutoCAD by R.B.Choudary/ Anuradha Publishers.

I Year B.Tech – II Sem**Code: 121EN02**

ENGLISH – II
(Common to all branches)
(English Language Teaching Through Literature)

L	T	P/D	C
2	1	-	2

UNIT – I

1. Speech : Swami Vivekananda
2. Grammar : Phrasal Verbs

UNIT – II

1. Short Story : Ha' Penny – Alan Paton
2. Grammar : Concord-Subject-Verb Agreement

UNIT – III

1. Letter : Abraham Lincoln's Letter to His Son's Teacher
2. Grammar : Sentence Construction-I

(Kinds of Sentences-Assertive, Imperative,
Interrogative, Exclamatory)

UNIT – IV

1. Short Story : The Only American From Our Village by Arun Joshi
2. Grammar : Sentence Construction-II
(Simple, Compound, Complex sentences)

UNIT – V

1. Essay : 'Of Studies' -Francis Bacon
2. Grammar : Idioms

UNIT –VI

1. Speech : Polonious Speech –An extract from
Shakespeare's *Hamlet*
2. Short Story : Luck – Mark Twain

TEXT BOOKS:

1. Inspiring Speeches and Lives; B. Yadava Raju, Maruthi Publications, Guntur.
2. Vignettes of Life (A collection of short stories by T. Padma), McMillan India Ltd.

REFERENCE BOOKS:

1. Barron's TOEFL; Barron, Galgotias Publication Pvt. Ltd.
2. A Modern Approach to Verbal and Non Verbal Reasoning – R S Aggarwal, S.Chand Publications.

Code: 121MA03

I Year B.Tech – II Sem
ENGINEERING MATHEMATICS – II
 (Common to all branches except Bio-Technology)

L	T	P/D	C
3	1	-	3

UNIT-I

Ordinary Differential Equations Of First Order: Differential equations of first order and first degree – Exact, linear and Bernoulli equations. Applications- law of natural growth and decay and Newton’s law of cooling, Orthogonal Trajectories.

UNIT-II

Ordinary Linear Differential Equations Of Higher Order: Linear differential equations of second and higher orders with constants coefficients – Method of variation of parameters – Systems of linear differential equations with constant coefficients.

UNIT-III**Partial Differential Equations:**

Partial differential equations: Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions – Solutions of first order linear equation – Non-linear (Standard type) equations, Method of separation of variables.

UNIT-IV**Laplace Transformations:**

Laplace Transformations – Laplace transform, Shifting theorems, Multiplication by powers of t, Division by t, Laplace transform of Unit Step function, Impulse function, and periodic functions.

Inverse Laplace transforms:

Inverse Laplace transforms, Shifting theorems, Partial fraction method, convolution theorem (without proof), solutions of ordinary differential equations with constant coefficients

UNIT-V**Z- transforms:**

Z- transforms – Inverse Z- transforms – properties – Damping rule – Shifting rules – Initial and final value theorems – Convolution theorem – Solution of difference equation by Z- transforms

UNIT-VI

Fourier series: Fourier series – Even and Odd functions – Fourier series in an arbitrary interval – Half-range Fourier sine and cosine series.

Fourier Transforms:

Fourier transformation, sine and cosine transformations, Finite Fourier transforms, parseval’s identities.

TEXT BOOKS:

1. Advanced Engineering Mathematics, S. R. K. Iyengar and R.K. Jain, Narosa Publishing House, London, 2002.
2. Higher Engineering Mathematics, B.S. Grewal, Khanna Publications, New Delhi.
3. Engineering Mathematics, B. V. Ramana, Tata McGraw Hill Publishing Company Ltd.

REFERENCE BOOKS:

1. A text Book of KREYSZIG’s Engineering Mathematics, Dr. A. Ramakrishna Prasad, Wiley Publications.
2. A text book of Engineering Mathematics, Dr.M. Venkata Krishna, G.Shankar Rao, Galgotia Publications, New Delhi

Code: 121PH02

I Year B.Tech – II Sem
ENGINEERING PHYSICS – II
(For EEE, ECE, ECM, CSE, IT)

L	T	P/D	C
3	1	--	3

UNIT-I

Semiconductor Physics: Fermi Level in Intrinsic and Extrinsic Semiconductors, Intrinsic Semiconductors and Carrier Concentration, Extrinsic Semiconductors and Carrier Concentration-drift & diffusion, Direct & Indirect Band Gap Semiconductors, Hall Effect in semiconductors.

UNIT-II

Physics of Semiconductor Devices: Formation of PN Junction and working of PN junction. Energy Diagram of PN Diode, I-V Characteristics of PN Junction, LED.

UNIT-III

Dielectric Properties: Electric Dipole, Dipole Moment, Dielectric Constant, Electric Susceptibility, Polarizability, Electronic, Ionic and Orientation Polarizations and Calculation of Polarizabilities, Piezo-electricity, Pyro-electricity and Ferro- electricity.

UNIT - IV

Magnetic Properties: Electron spin, Relation between electron spin and magnetic moment, Origin of Magnetic Moment, Bohr Magneton, Classification of Dia, Para and Ferro Magnetic Materials on the basis of Magnetic Moment, Domain Theory of Ferro Magnetism on the basis of Hysteresis Curve, Soft and Hard Magnetic Materials, Properties of Anti-Ferro and Ferri Magnetic Materials, super conductivity – Meisner's effect.

UNIT - V

Lasers: Characteristics of Lasers, Spontaneous and Stimulated Emission of Radiation, Meta-stable State, Population Inversion, Lasing Action, Einstein's Coefficients and Relation between them, Ruby Laser, Helium-Neon Laser, Semiconductor Diode Laser, Applications of Lasers.

Basics of Fiber Optics: Introduction, Principle of Optical Fiber, Acceptance Angle and Acceptance Cone, Numerical Aperture, Types of Optical fibres. Attenuation in Optical Fibers, Application of Optical Fiber in communication system.

UNIT - VI

Nanotechnology: Origin of Nanotechnology, Nano Scale, Surface to Volume Ratio, Quantum Confinement, Bottom-up Fabrication: Sol-gel, Precipitation, Combustion Methods; Top-down Fabrication: Chemical Vapour Deposition, Thermal evaporation, (XRD&TEM), carbon nanotubes.

TEXT BOOKS:

1. Engineering Physics- P K Palanisamy, Sitech Publications

REFERENCE BOOKS:

1. Introduction to Solid State Physics, by Charles Kittel
2. Solid State Physics Neil - W. Ashcroft, N. David Mermin
3. Solid State Physics - S L Singal
4. Physics for semiconductor devices - Michael Shur
5. Nanotechnology: A Gentle Introduction To The Next Big Idea - M Ratner, D Ratner
6. Nano Materials - A K Bandyopadhyay

Code: 121CS01

I year B.Tech – II Sem
DATA STRUCTURES AND C++
 (Common to all branches)

L	T	P/D	C
4	1	-	4

UNIT – I

Introduction to data structures: Abstract data type(ADT), Stacks and Queues circular queues and their implementation with arrays.Stack applications: infix to post fix conversion, postfix expression evaluation. Applications of queues.

UNIT – II

Singly linked lists, doubly linked lists, circular list and their operations, representing stacks and queues with linked lists.

UNIT – III

Trees- Binary tree, terminology, representation, traversals
 Graphs- terminology, representation, graph traversals (dfs & bfs).

UNIT - IV

Searching - Linear and binary search methods.
 Sorting - Bubble sort, selection sort, Insertion sort, Quick sort, merge sort.

UNIT – V

Introduction to C++ programming-object oriented programming concepts, Structured Vs OOP.
 Classes and objects-class definition, Objects, class scope and accessing members, Constructors-default constructor, parameterized constructor, constructor initialization list, copy constructor. Destructors.

UNIT – VI

Static class members, this pointer, friend functions, Dynamic memory management with operators new and delete.Overloading-function overloading, Operator overloading, restrictions on operator overloading, overloading unary and binary operators,templates, inheritance.

TEXT BOOKS

- 1.Data Structure Through C by Yashavant Kanetkar.
- 2.The complete reference C++ By Herb Schildt.
3. Data Structures, A pseudocode Approach with C by Richard F. Gilberg & Behrouz A. Forouzan.

REFERENCES

1. Alfred V. Aho, Jeffrey D. Ullman, John E. Hopcroft. *Data Structures and Algorithms*. Addison Wesley, 1983.
2. Data Structures using c Aaron M.Tenenbaum , Yedidyah Langsam,Moshe J Augenstein.
3. Introduction to Data Structures In C By Kamtane

Code: 121ME02

I year B.Tech – II Sem
ENGINEERING DRAWING–II
 (Common to all branches)

L	T	P/D	C
1	---	3	2

UNIT – I

Scales: Construction of Plain, Diagonal, Comparative, Vernier Scales and Scale of chords.

UNIT – II

Development of Surfaces: Development of Surfaces of Right Regular Solids – Prisms, Cylinders, Pyramids, Cones and their parts.

UNIT – III

Isometric Projections/views: Principles of Isometric Projection – Isometric Scale – Isometric Views – Conventions – Isometric Views of Lines, Plane Figures, Simple and Compound Solids – Isometric Projection of objects having non- isometric lines.

Conversion of Orthographic Views to Isometric Views of simple objects.

UNIT –IV

Transformation of Projections: Conversion of isometric views to orthographic views of simple objects.

UNIT –V

Perspective Projections: Principle, Perspective elements, Perspective View of Points, Lines, Plane Figures and Simple Solids - Vanishing Point Method, Visual ray method.

UNIT –VI

Introduction to Computer Aided Drafting: Generation of points, lines, curves, polygons, simple solids, dimensioning.

TEXT BOOKS:

1. Engineering Drawing, N.D. Bhatt / Charotar publishers
2. Engineering Drawing, K.L.Narayana and Kannaiah / Sciotech publishers.

REFERENCES:

1. Engineering graphics with Auto CAD- R.B Choudary / Anuradha Publishes
2. Engineering Drawing, K.Venugopal/G.Sreekanjana, New Age International Publishers.
3. Engineering Drawing, B.V.R.Gupta, M.Raja Roy/I.K.International Publishing House.

I Year B.Tech II Sem**Code: 121CH02****ENGINEERING CHEMISTRY-II
(Common to all Branches Except BT)**

L	T	P/D	C
2	1	0	2

UNIT I: PHASE RULE

Definitions – phase, component, degree of freedom, phase rule equation. Phase diagrams – one component system: Water system. Two component system lead – silver system, heat treatment based on iron carbon phase diagram, hardening, annealing.

UNIT II: POLYMER TECHNOLOGY

Polymers, terminology, Polymerization- Types of Polymerization – Addition and Condensation and Co-Polymerization. Plastics – Thermosetting and Thermoplastics – Preparation, Properties and applications of the following:

PVC, Teflon, Bakelite, Nylon 6:6 and Dacron.

Rubber-natural and artificial rubber, Vulcanization of natural rubber, Buna S, Buna N, Thiokol.

Conducting Polymers: Classification, Poly acetylene, polyaniline and their applications.

UNIT III: SURFACE CHEMISTRY

Solid surfaces, types of adsorption, Langmuir adsorption isotherm, BET adsorption isotherm. Calculation of surface area of solid & application of adsorption, classification of colloids, Electrical & optical properties of colloids and applications of colloids in industry.

UNIT IV: CHEMICAL FUELS

Fuels, classification –Solid fuels – coal – analysis – proximate and ultimate analysis and their significance
Liquid fuels – primary – petroleum – refining of petroleum –synthetic petrol – Bergius and Fischer Tropsch's process; Gaseous fuels – natural gas, analysis of flue gas by Orsat's method Combustion – problems, Calorific value of fuel – HCV, LCV, determination of calorific value by Junker's gas calorimeter. Combustion cracking knocking

UNIT V: LUBRICANTS

Definition and function of lubricants – Types of Lubrication and Mechanism – Thick Film or Hydrodynamic Lubrication, Thin Film or Boundary film Lubrication, Extreme Pressure Lubrication. Classification and properties of lubricants – Viscosity, flash and fire points, cloud and pour points, aniline point, Neutralization Number and Mechanical Strength.

UNIT-VI: REFRACTORIES AND INSULATORS

Refractories-Definition, Classification with Examples; Criteria of a Good Refractory Material; Causes for the failure of a Refractory Material ; Insulators –Definition and Classification with Examples; Characteristics of Insulating Materials ; Thermal Insulators, Electrical Insulators – Their Characteristics and Engineering Applications.

TEXT BOOKS:

1. Engineering Chemistry: Dr.M.Tirumala Chary and Dr.E.Laxminarayana, Scitech publications.
2. Engineering Chemistry: P.K. Jain and M.K. Jain, Dhanpathrai Publications – 14th Edition

REFERENCE BOOKS:

1. Essentials of Physical chemistry; Baul & Tuli; S. Chand Publications.
2. Text of Engineering Chemistry - S.S. Dara & Mukkati S. Chand & Co, New Delhi(2006)
3. Chemistry of Engineering Materials - CV Agarwal, C.P Murthy, A.Naidu, BS Publications.
4. Engineering Chemistry - R. P. Mani, K. N. Krishna B. Rama Devi Cengage Learning New Delhi (2010).
5. Engineering Chemistry - Shiva Shnakar Tata McGraw Hill (2010).

Code: 121EE01

**I year B.Tech – II Sem
CIRCUITS & NETWORKS – I**

L	T	P/D	C
4	1	-	4

UNIT – I: INTRODUCTION TO ELECTRICAL CIRCUITS:

Circuit concept, R – L – C parameters, Voltage and current sources, Independent and dependent sources, Source transformation, Kirchoff's Laws, Network reduction techniques, Series, Parallel, Series - parallel, Star – to – delta and Delta – to – star transformation, Mesh analysis, Nodal analysis, Concept of super mesh and super node. Voltage current relationship for passive elements (for different input signals – square, ramp, saw tooth, triangular)

UNIT – II: NETWORK TOPOLOGY :

Definitions, Graph, Tree, Basic cutset and Basic tieset matrices for planar networks, Loop and Nodal methods of analysis of Networks using graph theory, Duality & dual networks

UNIT – III: MAGNETIC CIRCUITS:

Basic terms in Magnetic Circuits, Comparison between electric and magnetic circuits, Composite magnetic circuit, Analysis of series, parallel magnetic circuits, Faraday's Laws of electromagnetic induction, Concept of self and mutual inductance, Dot convention, Co-efficient of coupling.

UNIT - IV: SINGLE PHASE A.C. CIRCUITS:

R.M.S. and Average values, Form factor for different periodic wave forms, j Notation, Complex and polar forms of representation, Steady state analysis of R,L,C circuits (in series, parallel and series parallel combinations) with sinusoidal excitation, Concept of Reactance, Impedance, Susceptance and Admittance, Phase angle, Concept of power factor, Real, Reactive powers and Complex power.

UNIT – V: LOCUS DIAGRAMS & RESONANCE:

Locus diagrams of R-L, R-C circuits with variation of various parameters (series and parallel), Resonance in series, parallel circuits, Concept of band width and Q factor.

UNIT – VI: NETWORK THEOREMS:

Tellegen's, Superposition, Reciprocity, Thevinin's, Norton's, Maximum Power transfer, Millman's and Compensation theorems with D.C.& A.C. excitations.

TEXT BOOKS:

1. Engineering circuit analysis - William Hayt and Jack E.Kemmerly, Tata McGraw - Hill Company, 6th edition.
2. Circuits & Networks - A.Sudhakar and Shyamamohan S.Palli, Tata McGraw – Hill, 3rd edition.

REFERENCES:

1. Network Analysis - M.E. Vanvalkenberg, Printice Hall of India, 3rd edition
2. Circuit theory (Analysis & Synthesis)- A.Chakravarthy, Dhanpath Rai & Co., 6th edition.

CODE: 121EN72

**I year B.Tech – II Sem
ENGLISH LANGUAGE LAB – II**

(Common to all branches)

L	T	P/D	C
-	-	2	1

Introduction

The introduction of the English Language lab is considered essential at third year level. At this stage the students need to prepare themselves for their careers which may require them to listen to, read, speak and write in English both for their professional and interpersonal communication in the globalize context. The proposed course should be an integrated theory and lab course to enable students to use good English and perform the following:

- Gather ideas and information, to organize ideas relevantly and coherently
- Engage in debates
- Participate in group discussions
- Face interviews
- Write project/research reports/technical reports
- Make oral presentations
- Write formal letters
- Transfer information from non-verbal to verbal texts and vice versa
- To communicate effectively in informal and formal situations

Objectives

The lab focuses on using computer-aided multimedia instruction for language development to meet the following targets:

1. To enable them to learn better pronunciation through stress on word accent, intonation, and rhythm.
2. To improve the students' fluency in English, through a well-developed vocabulary and enable them to listen to English and respond appropriately in different professional contexts.
3. To help the students cultivate the habit of reading passages from the computer monitor, thus providing them with the required facility to face computer-based competitive exams such as GRE, TOEFL, GMAT etc.
4. To enable the students in equipping themselves in being assertive and convincing, while debating.

Syllabus

1. Introduction to Stress and Intonation.
2. Functional English –Starting a conversation-responding appropriately and relevantly-using the right body language-role plays based on different situations
3. Vocabulary building – Synonyms and antonyms, word roots, one-word substitutes, prefixes and suffixes, etymology, analogy, idioms and phrases
4. Reading Comprehension – Reading for facts, guessing meanings from the context, scanning, skimming, inferring meaning and critical reading
5. Debate

Minimum Lab Requirement:

The English language lab shall have two parts:

- a. The Computer Aided Language Lab for 60 students with 60 systems, one master console, LAN facility and English Language software for self-study by learners.

- b. The Communication Skills lab with movable chairs and audio visual aids with a PA system. A T V, Digital stereo-audio and video system and camcorder etc.

Suggested Software:

- ❖ Hi Class system Monitoring Software
- ❖ Globerena English Lab Plus software
- ❖ GRE Computer based test (booklet + CD)
- ❖ GMAT Computer based test (booklet + CD)
- ❖ GRE computer based test (booklet + CD)
- ❖ IELTS preparatory guide CD

REFERENCES:

1. Communicate or Collapse: A Handbook of Effective Public Speaking
2. Group Discussions and Interviews by Pushpa Lata & Kumar, Prentice Hall of India
3. Academic Writing – A practical Guide for students by Stephen Bailey, Rontledge Falmer, London and New York, 2004

Code: 121CS71

I year B.Tech – II Sem
DATA STRUCTURES AND C++ LAB
(Common to all branches)

L	T	P/D	C
-	-	3	2

1. Write a C program that implement stack and its operations using arrays
2. Write a C program that implement Queue and its operations using arrays.
3. Write a C program that uses Stack operations to perform the following
 - i) Converting infix expression into postfix expression
 - ii) Evaluating the postfix expression
4. Write a C program that uses functions to perform the following operations on singly linked list.:
 - i) Creation ii) Insertion iii) Deletion iv) Traversal
5. Write a C program that uses functions to perform the following operations on doubly linked list.:
 - i) Creation ii) Insertion iii) Deletion iv) Traversal in both ways
6. Write a C program that uses functions to perform the following:
 - i) Creating a Binary Tree of integers
 - ii) Traversing the above binary tree in preorder, inorder and postorder.
7. Write C programs that use both recursive and non recursive functions to perform the following searching operations for a Key value in a given list of integers :
 - i) Linear search ii) Binary search
8. Write C programs that implement the following sorting methods to sort a given list of integers in ascending order:
 - i) Bubble sort ii) Quick sort
9. Write C programs that implement the following sorting methods to sort a given list of integers in ascending order:
 - i) Insertion sort ii) Merge sort iii) Selection Sort
10. Write a C++ program that prints all real solutions to the quadratic equation $ax^2+bx+c=0$. Read in a,b,c and use the quadratic formula. If the discriminant b^2-4ac is negative, display a message stating that there are no real solutions.
11. A Fibonacci Sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C++ program to generate the first n terms of the sequence.
12. Write a C++ program that checks whether a given string is palindrome or not.

TEXT BOOKS:

1. Data Structure through C by Yashavant Kanetkar.
2. The complete reference C++ by Herb Schildt.
3. Data Structures, A pseudocode Approach with C by Richard F. Gilberg & Behrouz A. Forouzan.

Code:121ME72

I year B.Tech – II Sem
ENGINEERING WORKSHOP-II
(Common to all branches except CSE & IT)
(ALTERNATE WEEKS)

L	T	P/D	C
-	-	3/2	1

1. Fitting

To make a Step Fitting as per the dimensions

To make a Half Round Fitting as per the dimensions

2. Tin Smithy

Preparation of Funnel

Preparation of Square box

3. Smithy

- Fabrication of S - Shape
- Fabrication of Hook shape

Code: 121PH72

I year B.Tech – II Sem
ENGINEERING PHYSICS LAB – II
(Common to all branches except Bio-Tech)
(ALTERNATE WEEKS)

	L	T	P/D	C
1. Energy gap of a semiconductor	-	-	3/2	1
2. To study the characteristics of a thermistor				
3. Characteristics of laser Diode				
4. Numerical aperture of optical fiber				
5. Bending loss of optical fiber				
6. Stewart & Gee's Experiment (Determination of magnetic induction flux density along the axis of a circular coil).				
7. Newton's Rings				
8. Hall effect				
9. Dielectric constant of a given material				

Note: Any six of the above nine Experiments are to be conducted

Code: 121MA05

II year B.Tech – I Sem
ENGINEERING MATHEMATICS-III

L	T	P/D	C
3	2	-	3

UNIT I**Special Functions:**

Beta, Gamma Functions – properties, Bessel's Functions and Legendre's Polynomials - recurrence relations (without proofs), generating function and properties.

UNIT II**Analytic functions and Complex integration:**

Analytic functions, Cauchy-Riemann equations, Complex integration, Cauchy's integral theorem, Cauchy's integral formula,

UNIT III**Complex power series and residues:**

Taylor's and Laurent's series, Cauchy's residue theorem.

UNIT IV**Interpolation:**

Introduction— Finite differences- Forward Differences, Backward differences, Central differences. Newton's formulae for interpolation – Gauss Central Difference Formulae (without proofs), Lagrange's Interpolation formula for unevenly spaced points.

UNIT V**Solution of algebraic and transcendental equations and Numerical integration:**

Introduction – The Bisection Method – The Method of False Position – The Iteration Method – Newton-Raphson Method, Trapezoidal rule – Simpson's 1/3 rule – Simpson's 3/8 rule, Gaussian quadrature rule.

UNIT VI**Numerical solution of Ordinary Differential equations:**

Solution by Taylor's series – Picard's Method of successive Approximations – Euler's Method – Runge-Kutta Methods (without proofs).

TEXT BOOKS:

1. Advanced Engineering Mathematics, S. R. K. Iyengar and R.K. Jain, Narosa Publishing House, London, 2002.
2. Higher Engineering Mathematics, B.S. Grewal, Khanna Publications, New Delhi.
3. Engineering Mathematics, B. V. Ramana, Tata McGraw Hill Publishing Company Ltd.

REFERENCE BOOKS:

1. A text Book of KREYSZIG's Engineering Mathematics, Dr. A. Ramakrishna Prasad, Wiley Publications.
2. A text book of Engineering Mathematics, M. Venkata Krishna, Jaico Publishing House, 2010.

Code: 121EC06

II year B.Tech – I Sem
SWITCHING THEORY AND LOGIC DESIGN
(Common to All Branches except Biotech & Mech)

L	T	P/D	C
3	1	-	3

UNIT - I

Boolean algebra: Axiomatic definition of Boolean algebra, Binary operators, postulates of and theorems. Switching functions, Canonical forms and Standard forms, Simplification of switching functions using theorems.

UNIT - II

Minimization of Switching Functions: Karnaugh map method, Prime implicants, don't care combinations, Minimal SOP and POS forms, Quine-McCluskey Tabular Method, Prime Implicant chart, simplification rules.

UNIT - III

Combinational Logic Design: Single output and multiple output combinational logic circuit design, AND-OR, OR-AND, and NAND/NOR realizations, Exclusive-OR and Equivalence functions, Binary adders/subtractors, Encoder, Decoder, Multiplexer, Demultiplexer, MUX realization of switching functions, Parity bit generator, Code-converters, Contact Networks, Hazards and hazard free realizations.

UNIT - IV

Programmable Logic Devices, Threshold Logic: Basic PLD's-ROM, PROM, PLA, and PLD Realization of Switching functions using PLDs.

Threshold Logic: Capabilities and limitations of Threshold gate. Synthesis of threshold functions. Multigate Synthesis.

UNIT - V

Sequential Circuits: Classification of sequential circuits (Synchronous, Asynchronous Pulse mode, and Level mode with examples). Basic flip-flops-Triggering and excitation tables. The sequential circuit model. Design of simple synchronous sequential circuits such as counters. Design of modulo-N Ring & Shift counters, Serial binary adder, and sequence detector.

Introduction to Asynchronous Machines.

UNIT - VI

Algorithmic State Machines: Salient features of the ASM, ASM chart-simple examples-System design using data path and control subsystems- control implementations- Examples of weighing machine and Binary multiplier.

TEXT BOOKS:

1. Digital design – Morris Mano, PHI, 2nd Edition.
2. Switching & Finite Automata theory – Zvi Kohavi, TMH, 2nd Edition.

REFERENCES:

1. An Engineering Approach to Digital Design – Fletcher, PHI.
2. Fundamentals of Logic Design – Charles H. Roth, Thomson Publications, 5th Edition, 2004.
3. Switching Theory and Logic Design-R.P.Jain,TMH Edition,2003.
4. Digital Logic Applications and Design – John M. Yarbrough, Thomson Publications, 2006
5. Switching Theory and Logic Design – CVS Rao, Pearson Education, 2005

121EC05

II Year B.Tech.– I Semester
ELECTRONIC DEVICES AND CIRCUITS
 (Common to ECM and EEE)

L T P/D C
3 2 - 3

UNIT-I ELECTRON DYNAMICS AND CRO:

Motion of charged particles in electric and magnetic fields, Simple problems involving electric and magnetic fields only. Electrostatic and magnetic focusing, Principles of CRT, deflection sensitivity (Electrostatic and magnetic deflection), Parallel Electric and Magnetic fields, Perpendicular Electric and Magnetic fields.

UNIT-II PN JUNCTION DIODE:

PN junction at equilibrium - Forward and reverse bias junctions - steady state conditions - forward and reverse bias- transient and AC conditions - non ideal junctions – break down of junctions(Avalanche and Zener Break down) -Zener Diode Characteristics.

High Frequency Diodes: Principles of operation of Tunnel Diode, Gunn Diode, Varactor Diode, Schottky barrier Diode, PIN Diode

UNIT-III BIPOLAR JUNCTION TRANSISTOR:

Fundamentals of BJT operation- saturation, active and cut off characteristics - switching characteristics - characteristics - minority carrier profiles -BJT models-Frequency limitations of BJTs.-Biasing methods-stabilization, Thermal runaway in BJTs. Small signal model. BJT as an amplifier in CB, CE configurations -h-parameter representation- Determination of voltage gain, current gain, input impedance and output impedance. CE amplifier - its analysis and its frequency response.

UNIT-IV FIELD EFFECT TRANSISTOR:

JFET characteristics (Qualitative and Quantitative discussion), Small signal model of JFET, MOSFET characteristics (Enhancement and depletion mode), Symbols of MOSFET, Comparison of Transistors, Introduction to SCR and UJT.

UNIT-V TRANSISTOR AMPLIFIERS:

Analyses and design of CC, CE and CB configurations - RC coupled amplifiers – Frequency response of amplifiers

UNIT- VI VOLTAGE REGULATORS:

Terminology, Basic Regulator Circuit, Short Circuit Protection, Current Limiting, Specifications of Voltage Regulator Circuits, Voltage Multipliers.

TEXT BOOKS:

1. Electronic Devices and Circuits-J.Millman, C.C.Halkias and satyabratha jit Tata Mc Graw Hill, 2 nd Ed. 2007
2. Electronic Devices AND Circuits-R.L.Boylestad & Louis Nashelsky, Pearson/Prentice Hall, 9th edition, 2006.

REFERENCES:

1. Integrated Electronics- J.Millman, C.C.Halkias, 1991 ed., 2008, TMH.
2. Electronic Devices and Circuits – K.LalKishore, 2 ed., 2005, BSPublications.
3. Electronic and Radio Engineering-F.E Terman, McGraw-Hill, 4th ed., 1955
4. Microwave Devices and Circuits-Samuel Y. Liao, PHI, 3rd Edition, 1994

Code: 121EE02

II year B.Tech – I Sem
ELECTRO MAGNETIC FIELDS

L	T	P/D	C
3	1	-	3

UNIT – I ELECTROSTATICS:

Electrostatic Fields – Coulomb’s Law – Electric Field Intensity (EFI) – EFI due to a line and a surface charge – Work done in moving a point charge in an electrostatic field – Electric Potential – Properties of potential function – Potential gradient – Guass’s law – Application of Guass’s Law – Maxwell’s first law, $\text{div}(\mathbf{D}) = \rho_v$ - Laplace’s and Poisson’s equations.

UNIT – II ELECTRIC DIPOLE & CONDUCTORS:

Electric dipole – Dipole moment – potential and EFI due to an electric dipole – Torque on an Electric dipole in an electric field, Energy stored and energy density in a static electric field.
Behavior of conductors in an electric field, Conductors and Insulators, Current density – conduction and Convection current densities – Ohm’s law in point form – Equation of continuity.

UNIT – III DIELECTRICS, CAPACITANCE & MAGNETO STATICS:

Electric field inside a dielectric material – polarization – Dielectric – Conductor and Dielectric – Dielectric boundary conditions, Capacitance – Capacitance of parallel plate and spherical and co-axial capacitors with composite dielectrics.
Static magnetic fields – Biot-Savart’s law – Oesterd’s experiment - Magnetic field intensity (MFI) – MFI due to a straight current carrying filament – MFI due to circular, square and solenoid current – Carrying wire – Relation between magnetic flux, magnetic flux density and MFI – Maxwell’s second Equation, $\text{div}(\mathbf{B}) = 0$

UNIT – IV AMPERE’S CIRCUITAL LAW & FORCE IN MAGNETIC FIELDS:

Ampere’s circuital law and its applications viz. MFI due to an infinite sheet of current and a long current carrying filament – Point form of Ampere’s circuital law – Maxwell’s third equation, $\text{Curl}(\mathbf{H}) = \mathbf{J}_c$, Field due to a circular loop, rectangular and square loops.
Magnetic force - Moving charges in a Magnetic field – Lorentz force equation – force on a current element in a magnetic field – Force on a straight and a long current carrying conductor in a magnetic field – Force between two straight long and parallel current carrying conductors –

UNIT – V MAGNETIC DIPOLE & MAGNETIC POTENTIAL:

Magnetic dipole and dipole moment – a differential current loop as a magnetic dipole – Torque on a current loop placed in a magnetic field.
Scalar Magnetic potential and its limitations – vector magnetic potential and its properties – vector magnetic potential due to simple configurations – vector Poisson’s equations.

UNIT – VI SELF & MUTUAL INDUCTANCE AND TIME VARYING FIELDS:

Self and Mutual inductance – Neumann’s formulae – determination of self-inductance of a solenoid and toroid and mutual inductance between a straight long wire and a square loop wire in the same plane – energy stored and density in a magnetic field.
Time varying fields – Faraday’s laws of electromagnetic induction – Its integral and point forms – Maxwell’s fourth equation, $\text{Curl}(\mathbf{E}) = -\partial\mathbf{B}/\partial t$ – Statically and Dynamically induced EMFs – Simple problems -Modification of Maxwell’s equations for time varying fields – Displacement current – Poynting Theorem and Poynting vector.

TEXT BOOKS:

1. “Engineering Electromagnetic’s” - William H. Hayt & John. A. Buck Mc. Graw-Hill Companies, 7th Edition. 2006.
2. “Electro magnetic Fields” - Sadiku, Oxford Publications

REFERENCES:

1. "Introduction to Electro Dynamics" - D J Griffiths, Prentice-Hall of India Pvt. Ltd, 2nd edition
2. "Electromagnetics" - J P Tewari.
3. "Electromagnetics" - J. D Kraus Mc Graw-Hill Inc. 4th edition 1992.
4. "Electromagnetic fields", - S. Kamakshaiah, Right Publishers, 2007.

Code: 121EE03

**II Year B.Tech – I Sem
ELECTRICAL MACHINES – I**

L	T	P/D	C
3	2	-	3

UNIT – I D.C. GENERATORS – CONSTRUCTION & OPERATION:

D.C. Generators, Principle of operation, Action of commutator, Constructional features, Armature windings, Lap and wave windings, Simplex and multiplex windings, Use of laminated armature, E. M.F Equation, Problems.

UNIT – II ARMATURE REACTION IN D.C. GENERATOR:

Armature reaction, Cross magnetizing and de-magnetizing AT/pole, compensating winding, Commutation reactance voltage, Methods of improving commutation, Simple Problems.

UNIT – III TYPES OF D.C GENERATORS:

Methods of Excitation, Separately excited and self excited generators, Build-up of E.M.F, Critical field resistance and critical speed, Causes for failure to self excite and remedial measures, Problems.

UNIT –IV LOAD CHARACTERISTICS OF GENERATORS :

Load characteristics of shunt, Series and compound generators, Parallel operation of d.c shunt and series generators, Load sharing, Problems.

UNIT – V D.C. MOTORS AND SPEED CONTROL METHODS :

D.C Motors, Principle of operation, Back E.M.F, Torque equation, Characteristics and application of shunt, Series and compound motors, Speed control of d.c. Motors: Armature voltage and field flux control methods. Ward-Leonard system, Principle of 3 point and 4 point starters, Protective devices, Problems.

UNIT – VI TESTING OF D.C. MACHINES:

Losses in a D.C. Machines, Calculation of efficiency, Condition for maximum efficiency, Methods of Testing, brake test , Swinburne’s test, Hopkinson’s test and Field’s test, Problems.

TEXT BOOKS:

1. Electric Machinery – A. E. Fitzgerald, C. Kingsley and S. Umans, Mc Graw-Hill Companies, 5th edition.
2. Electrical Machines – P.S. Bimbra, Khanna Publishers.

REFERENCES:

1. Performance and Design of D.C Machines – Clayton & Hancock, BPB Publishers.
2. Electrical Machines -S.K. Battacharya.
3. Electric Machines - I.J. Nagrath & D.P. Kothari, Tata Mc Graw – Hill Publishers, 3rd edition, 2004.

Code: 121EE04

**II year B.Tech – I Sem
CIRCUITS & NETWORKS- II**

L	T	P/D	C
4	1	-	4

UNIT – I: THREE PHASE CIRCUITS:

Phase sequence, Star and delta connection, Relation between line and phase voltages and currents in balanced system, Analysis of balanced and unbalanced 3 phase circuits, Measurement of 3 Φ active power by two watt meter method and reactive power by one watt meter method.

UNIT – II: D.C AND A.C. TRANSIENT ANALYSIS:

Transient response of R- L, R-C, R-L-C circuits (Series and parallel combination) for D.C. excitation, Initial conditions, Solution method using differential equation and laplace transforms. Transient response of R- L, R-C, R-L-C circuits (Series and parallel combination) for sinusoidal excitations, Initial conditions, Solution method using differential equation and laplace transforms.

UNIT – III: NETWORK FUNCTIONS:

The concept of complex frequency, Physical interpretation of complex frequency, Transform impedance and transform circuits, Series and parallel combination of elements, Terminal pairs or ports, Network functions for the one port and two-port, Poles and zeros of network functions, Significance of poles and zeros, Properties of driving point functions, Properties of transfer Functions, Necessary conditions for driving point functions, Necessary conditions for transfer functions, Time domain response from pole zero plot.

UNIT – IV: NETWORK PARAMETERS:

Two port network parameters, Z, Y, ABCD and hybrid parameters and their relations, Series, parallel and cascaded networks, Concept of transformed network, 2 port network parameters using transformed variables.

UNIT – V : FILTERS:

Classification of filters, Filter networks, Characteristic impedance in the pass and stop bands, Constant k and m – derived T – Section filters (Low pass, High pass, Band pass and Band stop), illustrative problems.

UNIT – VI : FOURIER ANALYSIS OF A.C. CIRCUITS:

The Fourier theorem, Consideration of symmetry, Exponential form of fourier series, Line spectra and phase angle spectra, Fourier integrals and fourier transforms, Properties of fourier transforms.

TEXT BOOKS:

1. Circuit theory (Analysis & Synthesis)- A.Chakravarthy, Dhanpath Rai & Co., 6th edition.
2. Electric Circuits – T.Nagasarkar Oxford publications.

REFERENCES:

1. Engineering circuit analysis - William Hayt and Jack E.Kemmerly, Tata McGraw - Hill Company, 6th edition.
2. Circuits & Networks - A.Sudhakar and Shyamamohan S.Palli, Tata McGraw – Hill, 3rd edition.

II year B.Tech – I Sem
Code: 121EN73 FUNCTIONAL AND COMMUNICATIVE WRITTEN ENGLISH
(Common to all branches)

L	T	P/D	C
-	-	3	2

Course Description

This course provides a platform for the learners to practice written communication to excel and sustain in the industry. It emphasizes on the techniques of collecting, organizing, and presenting information in formal settings. The focus is also on the use of appropriate vocabulary using different formats and templates to communicate in different professional situations.

Learning Objectives**By the end of the course, the students will be able to:**

1. Develop effective communication skills (spoken and written). Good oral and written communication skills
2. Perform all written tasks with clarity and coherence
3. Participate efficiently in group discussions
4. Take part effectively in various selection procedures adopted by the recruiters.
5. Develop Effective Presentation skills
6. Develop all-round personalities with a mature outlook to function effectively in different circumstances.

UNIT-I : TECHNICAL WRITING

- Introduction
- Techniques-pre-writing, writing, re-writing
- Objectives in technical writing: clarity, conciseness, accuracy, organisation, ethics.
- Exercises

UNIT – II GROUP DISCUSSION

- Introduction
- Personality Traits for GD
- Areas tested in GD – Content, Communication Skills, Group Dynamics and Leadership
- Tips on Group Discussion
- Group Discussion Etiquette – Dos and Don'ts

UNIT-III : CORRESPONDENCE

- Memos
- Letter writing in detail
- Resume'
- Exercises

UNIT – IV BODY LANGUAGE

- Introduction
- Importance of body language
- Body Language at work place
- Assessing the body language of others
- Understanding body language
- Improving one's body language

UNIT-V REPORT STRATEGIES

- The Summary
- Reports
- Proposals

TEXTBOOKS:

1. Technical Writing: Process and Product - Sharon J Gerson, 5th edition, Pearson publishers.
2. Soft Skills: Know yourself and know the World - Dr.K.Alex - S. Chand Publishing.

REFERENCES:

1. Prof. Kevnair's - Fluency Dictionaries
2. Kleiser Grenville-Common Errors in English:Aph publishing corporation
3. Shaw Harry and Collins- Errors in English Language and ways to correct them.
4. Body Language – Your success Mantra by Shalini Verma, S Chand, 2006
5. Strategies for Engineering Communication: Stevenson Susan and Steve Whitmore: Wiley, India.
6. How to build a better vocabulary – Nurnberg Maxwell & Morris Rosenblum: Grand Central Publishing
7. Six weeks to words of power –Funk Wilfred: W.R.Goyal Publishers & Distributors
8. Word power made easy – Norman Lewis
9. How to read better and faster: Norman Lewis, W.R.Goyal Publishers, New Delhi
10. Effective Technical Communication –Ashraf Rizvi.

II year B.Tech – I Sem
Code: 121EC71 ELECTRONIC DEVICES AND CIRCUITS LAB
(Common to ECE, ECM & EEE)

L T P/D C
0 0 3 2

ELECTRONIC WORKSHOP PRACTICE (in 6 lab sessions):

1. Identification, Specifications, Testing of R, L, C Components (Colour Codes), Potentiometers, Switches (SPDT, DPDT, and DIP), Coils, Gang Condensers, Relays, Bread Boards.
2. Identification, Specifications and Testing of Active Devices, Diodes, BJTs, Low power JFETs, MOSFETs, Power Transistors, LEDs, LCDs, Optoelectronic Devices, SCR, UJT, DIACs, TRIACs, Linear and Digital ICs.
3. Soldering practice – Simple Circuits using active and passive components.
4. Single layer and Multi layer PCBs (Identification and Utility).
5. Study and operation of
 - Multimeters (Analog and Digital)
 - Function Generator
 - Regulated Power Supplies
6. Study and Operation of CRO:

CRO Varieties and Operations:
 Oscilloscopes CRT features, vertical amplifiers, horizontal deflection system, sweep, trigger Pulse, delay line, sync selector circuits, simple CRO, triggered sweep CRO, Dual beam CRO, Measurement of amplitude and frequency.
 Dual trace oscilloscope, digital storage oscilloscope, Lissajous method of frequency measurement, standard specifications of CRO, probes for CRO- Active & Passive, attenuator type, Frequency counter, Time and Period measurement.
7. Data sheets of p-n junction diode, zener diode, transistor, FET, UJT and SCR

PART B: (For Laboratory examination – Minimum of 13 experiments)

1. PN Junction diode characteristics A. Forward bias B. Reverse bias.
2. Zener diode characteristics
3. Transistor CB characteristics (Input and Output)
4. Transistor CE characteristics (Input and Output)
5. Rectifier without filters (Full wave & Half wave)
6. Rectifier with filters (Full wave & Half wave)
7. FET characteristics
8. CE Amplifier
9. CC Amplifier (Emitter Follower).
10. FET amplifier (Common Source)
11. RC Phase Shift Oscillator
12. Feed back amplifier (Voltage Series).
13. Hartley Oscillator

II year B.Tech – I Sem**Code: 121EE71 ELECTRICAL CIRCUITS AND SIMULATION LAB**

L	T	P/D	C
-	-	3	2

PART-A: ELECTRICAL CIRCUITS:

- 1) Thevenin's, Norton's and Maximum Power Transfer Theorems
- 2) Superposition theorem and RMS value of complex wave
- 3) Verification of Compensation Theorem
- 4) Reciprocity, Millmann's Theorems
- 5) Locus Diagrams of RL and RC Series Circuits
- 6) Series and Parallel Resonance
- 7) Determination of Self, Mutual Inductances and Coefficient of coupling
- 8) Z and Y Parameters
- 9) Transmission and hybrid parameters
- 10) Measurement of Active Power for Star and Delta connected balanced loads
- 11) Measurement of Reactive Power for Star and Delta connected balanced loads
- 12) Measurement of 3-phase Power by two Wattmeter Method for unbalanced loads

PART-B: PSPICE SIMULATION:

- 1) Simulation of DC Circuits
- 2) DC Transient response
- 3) Mesh Analysis
- 4) Nodal Analysis

NOTE:

- PSPICE Software Package is necessary.
- Eight experiments are to be conducted from PART-A & any Two from PART-B

Code: 121MA07

**II year B.Tech – II Sem
PROBABILITY & STATISTICS**

L	T	P/D	C
3	1	-	3

UNIT I**Probability**

Sample spaces and Events – Counting, Probability, The Axioms of probability, some Elementary Theorems, Conditional probability – Baye’s Theorem.

*UNIT II***Probability Distributions**

Random variable – Discrete and continuous, Distribution function, Expectation and Probability distributions - Binomial, Poisson and normal distributions – related properties.

UNIT III**Sampling Distributions**

Populations and samples, Sampling distribution of the Mean (known) and The sampling distribution of the mean (unknown), proportions, sums and differences . Applications of central Limit Theorem. Estimation, Point estimation, Interval estimation and Bayesian estimation

UNIT IV**Inferences Concerning Means and Proportions**

Tests of Hypotheses, type –I and type-II errors, , Hypotheses concerning means and proportions for large size samples

UNIT V

Test of significance-Student t-test, F-tests, χ^2 test, test for goodness of fit, independence of attributes.

UNIT VI**Linear Programming:**

Introduction, Formulation of LPP, Graphical method, Simplex method.

TEXT BOOKS:

1. Advanced Engineering Mathematics, S. R. K. Iyengar and R.K. Jain, Narosa Publishing House, London, 2002.
2. Higher Engineering Mathematics, B.S. Grewal, Khanna Publications, New Delhi.
3. Engineering Mathematics, B. V. Ramana, Tata McGraw Hill Publishing Company Ltd.
4. Probability and Statistics for Engineers: Miller and John E. Freund, PHI Publishers, 6th Edition.

REFERENCE BOOKS:

1. Fundamentals of Mathematical Statistics: Gupta and Kapoor – S. Chand and Co.
2. Probability and Statistics for Engineers- Walpole and Meyer.
3. Probability and Statistics ,Dr.M. Venkata Krishna, B.S Publications

Code: 121EE05

**II year B.Tech – II Sem
ELECTRICAL MACHINES-II**

L	T	P/D	C
3	1	-	3

UNIT-I SINGLE PHASE TRANSFORMERS – CONSTRUCTION, OPERATION AND PERFORMANCE :

Single phase transformers-types - constructional details-minimization of hysteresis and eddy current losses-emf equation - operation on no load and on load - phasor diagrams- Equivalent circuit - losses and efficiency-regulation. All day efficiency - Effect of variations of frequency & supply voltage on iron losses

UNIT-II - TESTING OF SINGLE PHASE TRANSFORMER AND AUTOTRANSFORMER:

OC and SC tests - Sumpner's test - predetermination of efficiency and regulation-separation of losses test-parallel operation with equal and unequal voltage ratios - auto transformers-equivalent circuit - comparison with two winding transformers.

UNIT-III - POLYPHASE TRANSFORMERS:

Polyphase transformers - Polyphase connections - Y/Y, Y/ Δ , Δ /Y, Δ / Δ and open Δ , Third harmonics in phase voltages-three winding transformers-tertiary windings-determination of Z_p , Z_s and Z_t transients in switching - off load and on load tap changing; Scott connection.

UNIT- IV POLYPHASE INDUCTION MOTORS AND ITS CHARACTERISTICS:

Polyphase induction motors-construction details of cage and wound rotor machines-production of a rotating magnetic field - principle of operation - rotor emf and rotor frequency - rotor reactance, rotor current and pf at standstill and during operation- Rotor power input, rotor copper loss and mechanical power developed and their inter relation.

UNIT-V - TORQUE- SPEED CHARACTERISTICS AND CIRCLE DIAGRAM OF INDUCTION MOTORS:

Torque equation-deduction from torque equation- expressions for maximum torque and starting torque - torque slip characteristic- Double cage and deep bar rotors - crawling and cogging - equivalent circuit - phasor diagram-Circle diagram-no load and blocked rotor tests-predetermination of performance.

UNIT-VI METHODS OF STARTING AND SPEED CONTROL OF INDUCTION MOTOR:

Methods of starting and starting current and torque calculations-Speed control-change of frequency; change of poles and methods of consequent poles; cascade connection. injection of an emf into rotor circuit (qualitative treatment only)-induction generator-principle of operation.

TEXT BOOKS:

1. Electric machinery - A.E. Fitzgerald, C.Kingsley and S.Umans, Mc Graw Hill Companies, 5th edition
2. Electrical machines- PS Bhimbra, Khanna Publishers.

REFERENCES:

1. Performance and Design of AC Machines – MG.Say, BPB Publishers
2. Theory of Alternating Current Machinery – Langsdorf, Tata McGraw-Hill Companies, 2nd edition.
3. Electric Machines – I.J.Nagrath & D.P.Kothari, Tata Mc Graw Hill, 7th Edition.2005

Code: 121EE06

**II year B.Tech – II Sem
POWER SYSTEMS-I**

L	T	P/D	C
3	1	-	3

UNIT-I TRANSMISSION LINE PARAMETERS:

Types of conductors - calculation of resistance for solid conductors - Calculation of inductance for single phase and three phase, single and double circuit lines, concept of GMR & GMD, symmetrical and asymmetrical conductor configuration with and without transposition, Numerical Problems. Calculation of capacitance for 2 wire and 3 wire systems, effect of ground on capacitance, capacitance calculations for symmetrical and asymmetrical single and three phase, single and double circuit lines, Numerical Problems.

UNIT-II PERFORMANCE OF SHORT, MEDIUM AND LONG LENGTH TRANSMISSION LINES:

Classification of Transmission Lines - Short, medium and long line and their model representations - Nominal-T, Nominal-Pie and A, B, C, D Constants for symmetrical & Asymmetrical Networks, Numerical Problems. Mathematical Solutions to estimate regulation and efficiency of all types of lines - Numerical Problems.

Long Transmission Line-Rigorous Solution, evaluation of A,B,C,D Constants, Interpretation of the Long Line Equations, Surge Impedance and SIL of Long Lines, Wave Length and Velocity of Propagation of Waves - Representation of Long Lines - Equivalent-T and Equivalent Pie network models (numerical problems).

UNIT – III- VARIOUS FACTORS GOVERNING THE PERFORMANCE OF TRANSMISSION LINE:

Skin and Proximity effects - Description and effect on Resistance of Solid Conductors -Ferranti effect - Charging Current - Effect on Regulation of the Transmission Line, Shunt Compensation. Corona - Description of the phenomenon, factors affecting corona, critical voltages and power loss, Radio Interference.

Power system transients:

Types of System Transients - Traveling or Propagation of Surges - Attenuation, Distortion, Reflection and Refraction Coefficients - Termination of lines with different types of conditions - Open Circuited Line, Short Circuited Line, T-Junction, Lumped Reactive Junctions (Numerical Problems). Bewley's Lattice Diagrams (for all the cases mentioned with numerical examples).

UNIT-IV OVERHEAD LINE INSULATORS:

Types of Insulators, String efficiency and Methods for improvement, Numerical Problems – voltage distribution, calculation of string efficiency, Capacitance grading and Static Shielding.

Sag and tension calculations:

Sag and Tension Calculations with equal and unequal heights of towers, Effect of Wind and Ice on weight of Conductor, Numerical Problems - Stringing chart and sag template and its applications.

UNIT-V UNDERGROUND CABLES:

Types of Cables, Construction, Types of Insulating materials, Calculations of Insulation resistance and stress in insulation, Numerical Problems. Capacitance of Single and 3-Core belted cables, Numerical Problems. Grading of Cables - Capacitance grading, Numerical Problems, Description of Inter-sheath grading.

UNIT-VI -GENERAL ASPECTS OF DISTRIBUTION SYSTEMS:**D.C. Distribution Systems**

Classification of Distribution Systems - Comparison of DC vs AC and Under-Ground vs Over - Head Distribution Systems- Requirements and Design features of Distribution Systems-Voltage Drop

Calculations (Numerical Problems) in D.C Distributors for the following cases: Radial D.C Distributor fed one end and at the both the ends (equal/unequal Voltages) and Ring Main Distributor.

A.C. Distribution Systems.

Voltage Drop Calculations (Numerical Problems) in A.C. Distributors for the following cases: Power Factors referred to receiving end voltage and with respect to respective load voltages.

TEXT BOOKS:

1. A Text Book on Power System Engineering - M.L.Soni, P.V.Gupta, U.S.Bhatnagar, A.Chakrabarthy, Dhanpat Rai & Co Pvt. Ltd.
2. Electrical power systems - C.L.Wadhwa, New Age International (P) Limited, Publishers,1998.

REFERENCES:

1. Power system Analysis- John J Grainger William D Stevenson, TMC Companies, 4th edition
2. Power System Analysis and Design - B.R.Gupta, Wheeler Publishing.
3. Power System Analysis - Hadi Saadat – TMH Edition..
4. Modern Power System Analysis - I.J.Nagaraj and D.P.Kothari, Tata McGraw Hill, 2nd Edition.

Code: 121EE07

**II year B.Tech – II Sem
CONTROL SYSTEMS**

L	T	P/D	C
3	1	-	3

UNIT – I INTRODUCTION:

Concepts of Control Systems- Open Loop and closed loop control systems and their differences- Classification of control systems, Feed-Back Characteristics, Effects of feedback. Mathematical models – Differential equations, Impulse Response and transfer functions – Translational and Rotational mechanical systems

Transfer function representation:

Transfer Function of Synchro transmitter and Receiver, Block diagram representation of systems considering electrical systems as examples -Block diagram algebra – Representation by Signal flow graph - Reduction using Mason's gain formula.

UNIT-II TIME RESPONSE ANALYSIS:

Standard test signals - Time response of first order systems – Characteristic Equation of Feedback control systems, Transient response of second order systems - Time domain specifications – Steady state response - Steady state errors and error constants – Effects of proportional derivative, proportional integral systems, PID controllers.

UNIT – III STABILITY ANALYSIS IN S-DOMAIN :

The concept of stability – Routh's stability criterion – qualitative stability and conditional stability – limitations of Routh's stability.

Root Locus Technique: The root locus concept - construction of root loci-effects of adding poles and zeros to $G(s)H(s)$ on the root loci.

UNIT – IV FREQUENCY RESPONSE ANALYSIS:

Introduction, Frequency domain specifications-Bode diagrams-Determination of Frequency domain specifications and transfer function from the Bode Diagram-Phase margin and Gain margin-Stability Analysis from Bode Plots.

UNIT – V STABILITY ANALYSIS IN FREQUENCY DOMAIN :

Polar Plots-Nyquist Plots-Stability Analysis.

CLASSICAL CONTROL DESIGN TECHNIQUES: Compensation techniques – Lag, Lead, Lead-Lag Controllers design in frequency Domain.

UNIT – VI STATE SPACE ANALYSIS OF CONTINUOUS SYSTEMS:

Concepts of state, state variables and state model, derivation of state models from block diagrams, Diagonalization- Solving the Time invariant state Equations- State Transition Matrix and its Properties.

TEXT BOOKS:

1. Automatic Control Systems 8th edition –B. C. Kuo 2003– John wiley and son's.,
2. Control Systems Engineering – I. J. Nagrath and M. Gopal, New Age International (P) Limited, Publishers, 2nd edition.

REFERENCES:

1. Modern Control Engineering – Katsuhiko Ogata – Prentice Hall of India Pvt. Ltd., 3rd edition, 1998.
2. Control Systems – N.K.Sinha, New Age International (P) Limited Publishers, 3rd Edition, 1998.
3. Control Systems Engg. – NISE 3rd Edition – John wiley.
4. "Modeling & Control of Dynamic Systems" – Narciso F. Macia George J. Thaler, Thomson Publishers.

Code: 121EC33

**II year B.Tech – II Sem
ELECTRONIC CIRCUITS**

L	T	P/D	C
3	1	-	3

UNIT – I – SINGLE STATE AMPLIFIERS DESIGN AND ANALYSIS AND LINEAR WAVE SHAPING:

Review of CE, CB, CC & CS amplifiers- classification of Amplifiers, Distortion in amplifiers – Approximate analysis, CE, CB, CC amplifiers comparison.

Linear Wave shaping: high pass, low pass RC circuits, their response for sinusoidal, step, pulse, square, ramp inputs.

UNIT – II – BJT & FET FREQUENCY RESPONSE:

Logarithms- decibels – General Frequency consideration – Low frequency analysis – Low frequency response of BJT amplifiers- low frequency response of FET amplifier – Miller effect capacitance – High frequency response BJT amplifier –square wave testing.

UNIT – III- AMPLIFIERS:

Feed back amplifiers: Concept of feedback, classification of feedback amplifiers, General characteristics of negative feedback amplifiers, Effect of Feedback on Amplifier characteristics, voltage series shunt, current series and current shunt feedback configuration, simple problems.

Large signal amplifiers: Class, A power amplifier, Maximum Value of efficiency of Class – A amplifier, Transformer couple amplifier, Push Pull Amplifier, complimentary symmetry circuits (Transformer Less class B Power Amplifier), Phase inverters, Transistor Power Dissipation, Thermal Runway, Heat sinks.

UNIT – IV – OSCILLATORS AND MULTI VIBRATORS:

Conditions for oscillations, RC and LC type Oscillators, Crystal oscillators, Frequency and amplitude stability of oscillators, Generalized analysis of LC oscillators, Quartz, Hartley, and Colpitts Oscillators, RC-Phase shift and Wien-bridge oscillators. Analysis and Design of Bistable, Monostable, A stable Multi vibrators and Schmitt trigger using transistors.

UNIT – V: CLIPPERS AND CLAMPERS:

Diode clippers- Transistor clippers- clipping at two independent levels, Transfer characteristics of clippers, Emitter coupled clipper- comparators, Applications of voltage comparators, Clamping operation, clamping circuits with different inputs, clamping circuit theorem, practical clamping circuits, effect of diode characteristics on clamping voltage, transfer characteristics of clampers.

UNIT – VI – SWITCHING CHARACTERISTICS OF DEVICES:

Diode as a switch, piecewise linear diode characteristics, Transistor as a switch, Break down voltage consideration of transistor, saturation parameters of transistors and their variation with temperature, design of transistor switch, transistor , Switching times.

TEXT BOOKS:

1. Electronic Devices and Circuit Theory, Robert L. Boylestad, Louis Nasheisky, 9th Edition 2007, Pearson Education.
2. Solid State Circuits - David A.Bell 4th Edition, Prentice Hall of India.

REFERENCES:

1. Introductory Electronic Devices and Circuits (Conventional Flow version) - Robert T.Paynter, 7th Edition, 2009, PEI
2. Electronic Devices and Circuits- Ani K.Maini, Varsha Agarwal, 1st Edition, Wiley.

Code: 121ME04

II year B.Tech – II Sem
BASIC MECHANICAL ENGINEERING
(Common to all branches except Bio-Tech)

L	T	P/D	C
3	1	-	3

UNIT – I

Thermodynamics: Basic concepts of Thermodynamics, Property of gases, Zeroth Law, First Law of Thermodynamics and its applications, Second Law of Thermodynamics, Carnot cycle, Air standard cycles - Otto, Diesel Cycles

Internal combustion engines: Internal combustion engines, definitions, classification, components, working of two- stroke, four stroke cycle engines, SI and CI Engines, performance parameters, Need for cooling, and lubrication of IC engines.

UNIT – II

Steam generators: Classification of boilers, differences between fire tube and water tube boilers, Cochran and Lancashire boilers, Locomotive boiler, Babcock – Wilcox boiler and High pressure boilers - Benson and La-Mount boilers only.

Steam and Gas Turbines: Layout of steam power plant, types of steam turbines, differences between impulse and reaction turbines, description of impulse and reaction turbines, Schematic of gas turbine power plants - closed and open cycle types

UNIT – III

Refrigeration and Air Conditioning: Definition, Refrigeration and Air conditioning, Schematic and description of vapour compression refrigeration and vapour absorption systems, Domestic Refrigerator, summer and winter air conditioning systems.

UNIT – IV

Hydraulic pumps and Turbines: Reciprocating and centrifugal pumps and their applications. Layout of Hydro-electric power plant, Classification of hydraulic turbines, Description and principle of operation of Pelton wheel and Francis turbine (without velocity triangles), Axial flow reaction turbine.

UNIT- V

Metal casting: Casting methods-Sand casting, shell mold casting, Investment casting, Diecasting, - characteristics, advantages, limitations and applications.

Welding: Types of welding - arc welding, gas welding & gas cutting, resistance welding-spot welding, soldering and brazing

UNIT - VI**Mechanical working of metals:**

Concept of Hot working and cold working, Rolling, Extrusion, Forging, Press working operations, principle, characteristics, advantages, limitations and applications.

Machine Tools:

Principles of working of different types of machine tools - lathe, shaper, drilling, milling, grinding, and NC Machines - Operations performed and Applications.

TEXT BOOKS:

1. Mathur, M.L., Mehta, F.S. and Tiwari, R.P., Elements of Mechanical Engineering, Jain Brothers, New Delhi, 2005.
2. R.K. Rajput, "Elements of Mechanical Engineering", Laxmi Publications, 1994.

REFERENCES:

1. P.N.Gupta, M.P. Poonia, "Elements of Mechanical Engineering", Standard Publishers Distributors Nai Sarak, Delhi.
2. R.C.Gupta, "Mechanical Engineering", Khanna Publishers, Delhi.

Code: 121EN74

II year B.Tech – II Sem
EFFECTIVE ENGLISH COMMUNICATION
AND SOFT SKILLS
(Common to all branches)

L	T	P/D	C
-	-	3	2

Course Description

This course empowers the students for career opportunities, enhancing professional and personal growth. Effective communication and interpersonal skills are crucial to increase employment opportunities and to compete successfully in the business environment.

Soft skills provide students with a strong conceptual and practical framework to build, develop and manage teams. They play an important role in the development of the students' overall personality, thereby enhancing their career prospects. Training in soft skills provides strong practical orientation to the students and helps them in building and improving their skills in communication, the effective use of English, business correspondence, presentations, team building, leadership, time management, group discussions, interviews, and inter-personal skills. This training also helps students in career visioning and planning, effective resume writing and dealing with placement consultants and headhunters.

The training is conducted in a very informal, interesting and interactive manner, which gives ample scope for the students to interact with one other and face a wide variety of issues, topics, and situations that they are likely to come across as entry-level managers.

Learning Objectives:

By the end of the soft skills training program, the students will be able to:

- Develop effective communication skills (spoken and written).
- Develop effective presentation skills.
- Become adept using electronic communication
- Conduct effective business correspondence and prepare good business reports.
- Become self-confident individuals by mastering inter-personal skills, team management skills and leadership skills.
- Develop all-round personalities with a mature outlook to function effectively in different circumstances.
- Develop broad career plans, evaluate the employment market, identify the organizations to get good placement, match the job requirements and skill sets.

UNIT-I ELECTRONIC COMMUNICATION

- E-correspondence
- E-mail etiquette
- E-resume'; online job applications
- Letter of application
- Exercises

UNIT – II SOFT SKILLS

- Introduction
- Building attitude – personality traits
- Five aspects of soft skills – communication skills, problem solving skills, leadership skills, work ethics and team work
- Learning soft skills
- Impression management
- Goal setting Time management

UNIT – III: DEVELOPING POSITIVE ATTITUDE

- Introduction
- What is positive attitude?
- The power of positive attitude
- Positive thinking- the key to success
- Negative thinking
- Types of negative thinking
- The causes of negative attitude
- Consequences of negative attitude
- How to change negative attitude

UNIT – IV ETIQUETTE AND MANNERS

ETIQUETTE

- Introduction
- Modern etiquette
- Benefits of etiquette
- Classification of etiquette
- Telephone Etiquette
- Email Etiquette.

MANNERS

- Introduction
- Poor manners noticed in youth – why should good manners be practiced?
- Practicing good manners
- Professional manners
- Social skills (manners)

UNIT – V INTERVIEW SKILLS

- Introduction
 - On the day of interview
 - Dress code at interview
 - Job interview
- Why an interview?
- Types of interview
- Dress code for an interview
- Interview etiquette
- Types of questions asked
- Telephonic interview
- Possible reasons for rejecting a candidate
- Preparation before interview – basic tips.

TEXTBOOKS:

1. Technical Writing: Process and Product by Sharon J Gerson; Fifth edition. Pearson Publishers.
2. Soft Skills: Know yourself and know the World by Dr.K.Alex - S. Chand Publishing.

REFERENCES:

- 1.Prof. Kevnair's - Fluency Dictionaries
- 2.Kleiser Grenville-Common Errors in English:Aph publishing corporation
- 3.Shaw Harry and Collins- Errors in English Language and ways to correct them.
- 4.Body Language – Your success Mantra by Shalini Verma, S Chand, 2006
- 5.Strategies for Engineering Communication: Stevenson Susan and Steve Whitmore: Wiley, India.

6. How to build a better vocabulary – Nurnberg Maxwell & Morris Rosenblum: Grand Central Publishing
7. Six weeks to words of power – Funk Wilfred: W.R. Goyal Publishers & Distributors
8. Word power made easy – Norman Lewis
9. How to read better and faster: Norman Lewis, W.R. Goyal Publishers, New Delhi
10. Effective Technical Communication – Ashraf Rizvi

Code: 121EE73

**II year B.Tech – II Sem
ELECTRICAL MACHINES LAB – I**

L	T	P/D	C
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The following experiments are required to be conducted compulsory experiments:

1. Magnetization characteristics of DC shunt generator. Determination of critical field resistance and critical speed.
2. Load test on DC shunt generator. Determination of characteristics.
3. Load test on DC series generator. Determination of characteristics.
4. Load test on DC compound generator. Determination of characteristics.
5. Hopkinson's test on DC shunt machines. Predetermination of efficiency.
6. Fields test on DC series machines. Determination of efficiency.
7. Swinburne's test and speed control of DC shunt motor. Predetermination of efficiencies.
8. Brake test on DC compound motor. Determination of performance curves.

In addition to the above eight experiments, at least any two of the experiments from the following list are required to be conducted:

9. Brake test on DC shunt motor. Determination of performance curves.
10. Retardation test on DC shunt motor. Determination of losses at rated speed.
11. Separation of losses in DC shunt motor.

Code: 121EC85

**II year B.Tech – II Sem
ELECTRONIC CIRCUITS LAB**

L	T	P/D	C
-	-	3	2

Minimum ten experiments to be conducted:

1. Linear wave shaping.
2. Non Linear wave shaping – Clippers.
3. Non Linear wave shaping – Clampers.
4. Transistor as a switch.
5. Wien Bridge Oscillator using Transistors
6. RC Phase Shift Oscillator using Transistors
7. Astable Multivibrator.
8. Monostable Multivibrator.
9. Bistable Multivibrator.
10. Schmitt Trigger.
11. Common Emitter and Common Source amplifier
12. Current shunt and Feedback Amplifier
13. Class A Power Amplifier (Transformer less)
14. Class B Complementary Symmetry Amplifier

Equipment required for Laboratories:

- | | | |
|------------------------|---|--------------|
| 1. RPS | - | 0 – 30 V |
| 2. CRO | - | 0 – 20 M Hz. |
| 3. Function Generators | - | 0 – 1 M Hz |
| 4. Components | | |
| 5. Multi Meters | | |

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III Year B.Tech EEE - I Sem

(CODE: 3ZC01) MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Course Objective: To make the students understand the concepts and principles of Business Economics at micro level and basic principles of Financial Accounting and Analysis, which facilitate them in making better planning and decisions?

UNIT I

INTRODUCTION TO MANAGERIAL ECONOMICS: Definition, Nature and Scope of Business Economics–Demand Analysis: Demand Determinants, Law of Demand and its exceptions, Elasticity of Demand and Demand Forecasting.

UNIT II

THEORY OF PRODUCTION AND COST ANALYSIS: Production Function – Isoquants and Isocosts, Internal and External Economies of Scale, Laws of Returns. Cost Analysis: Cost concepts, different types of costs, cost control and cost efficiency, Break-even Analysis (BEA)-Determination of Break-Even Point (simple problems).

UNIT III

INTRODUCTION TO MARKETS: Market structures: Types of competition, Features of Perfect competition, Monopoly and Monopolistic Competition. Pricing strategies, transfer pricing and performance measurement, Price-Output Determination in case of Perfect Competition and Monopoly

UNIT IV

FUNDAMENTALS OF FINANCIAL ACCOUNTING: Concepts and conventions, principles of Double-Entry, Book Keeping, Journal, Ledger, Trial Balance, Final Accounts - Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments.

UNIT V

CAPITAL BUDGETING TECHNIQUES: Nature and scope of Capital Budgeting, Methods of Capital Budgeting: Traditional methods and Discounting Cash Flow methods.

UNIT VI

RATIO ANALYSIS: Introduction to Ratio analysis – Leverage ratios – Liquidity ratios – Turnover ratios – Profitability ratios, Du-pont chart. (Simple problems)

Books Recommended:

1. Aryasri: Managerial Economics and Financial Analysis, 2/e, TMH, 2005.

References:

1. Ambrish Gupta, Financial Accounting for Management, Pearson Education, New Delhi.
2. H. Craig Peterson & W. Cris Lewis, Managerial Economics, PHI, 4th Ed.
3. Suma Damodaran, Managerial Economics, Oxford University Press.
4. Lipsey & Chrystel, Economics, Oxford University Press.

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III Year B.Tech EEE - I Sem

(CODE: 3C513)

LINEAR AND DIGITAL IC APPLICATIONS

After studying this course, the students will be able to

1. Understand the concepts of Differential Amplifier and Operational Amplifier and their characteristics.
2. Understand the basic applications of Operational Amplifier.
3. Understand the design and analysis of Filters, Timers, Voltage Controlled Oscillator and Phase Locked Loop.
4. Understand the design and analysis of different types of Oscillators, D/A Converters and A/D Converters.
5. Understand the different classification of IC Logic Families and their characteristics.
6. Understand the combinational and sequential logic circuit design using TTL and CMOS logic technology.

Unit-I

OPAMP & ITS CHARACTERISTICS

Differential Amplifiers and its Characteristics. Op-Amp Block Diagram, Ideal OP-AMP Characteristics, DC and AC Characteristics. 741 Op-Amp and its Features and Characteristics. Parameters Measurement: Offset Voltage and Current, Slew Rate and CMRR. Frequency Compensation.

Unit-II

BASIC APPLICATIONS OF OP-AMPS

Adder/Subtractor, Difference Amplifier, Instrumentation Amplifier, Differentiator, Integrator, V/I & I/V Converters, Comparators, Multivibrators, Square and Triangular Waveform Generators, Clippers, Clampers, Peak Detector, S/H circuit.

Unit-III

FILTERS, TIMERS & PLLs

Filters: Introduction, Butterworth Filters- First and Second Order Active Filters- LPF, HPF, BPF, BRF. Introduction to 555 Timer, Functional Block, 555 timers as Monostable and Astable Multivibrators and Applications, Schmitt Trigger. Voltage Controlled Oscillator (IC 566), Phase Locked Loop.

Unit-IV

OSCILLATORS, D/A AND A/D CONVERTERS

Oscillators: Introduction, Design and Analysis of Wein Bridge, RC Phase shift Oscillators using op-amp.

D/A Converters: Introduction, Characteristic Parameters, R-2R Ladder, Weighted Resistor, Inverter R-2R type D/A Converter, IC 1408 DAC.

A/D Converters: Introduction, Characteristic Parameters, Counter Type, Dual Slope, Successive Approximation and Flash types A/D Converters.

Unit-V

LOGIC FAMILIES

Classification of IC Logic Families. Standard TTL NAND & NOR Gate-Analysis & Characteristics, TTL Open Collector Outputs. Tristate TTL. MOS & CMOS Logic, Open Drain and Tristate Outputs. ECL. Comparison of Various Logic Families. IC interfacing, TTL driving CMOS & CMOS driving TTL.

UNIT VII:

TTL-74XX Series ICs: COMBINATIONAL AND SEQUENTIAL CIRCUITS

Decoders. Priority Encoders, Multiplexers, Arithmetic Circuit ICs-Parallel Binary Adder.

Flip-flops- D flip-flop, JK flip-flop, T flip-flop and Master-slave JK flip-flop. Synchronous and Asynchronous Counters. Decade counters. Universal Shift Register.

Text Books -

1. D. Roy Chowdhary, *Linear Integrated Circuits*, New Age Publications (P) Ltd, 2nd Edition, 2003
2. Ramakanth A. Gayakwad, *Op-Amps & Linear ICs*, PHI, 1987.
3. John F. Wakerly, *Digital Design Principles & Practices*, PHI/ Pearson Education Asia, 3rd Ed., 2005.

References -

1. Sergio Franco, *Design with Operational Amplifiers & Analog Integrated Circuits*, McGraw Hill, 1988.
2. R.F.Coughlin & Fredrick Driscoll, *Operational Amplifiers & Linear Integrated Circuits*, PHI, 6th Edition.
3. K. Lal Kishore, *Linear Integrated Circuit Application*, Pearson Educations, 2005.
4. Millman, *Micro Electronics*, McGraw Hill, 1988.
5. C.G. Clayton, *Operational Amplifiers*, Butterworth & Company Publ. Ltd. Elsevier, 1971.

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(CODE: 3CC08) **III Year, B. Tech, EEE – I - Sem.**
SIGNALS AND SYSTEMS
(OPEN ELECTIVE-I)

After studying this course, the students will be able to

1. Understand the concepts of Signals, Classification of Signals, Signal Approximation and Orthogonal Functions.
2. Understand the concepts of Fourier series. Properties of Fourier series, Fourier Transforms and Properties of Fourier Transforms.
3. Understand the concepts of Systems, Classification of Systems, Filter Characteristics of Linear Systems, Ideal LPF, HPF and BPF Characteristics and Relationship between Bandwidth and Rise Time.
4. Understand the Concept of Convolution in Time Domain and Frequency Domain, Convolution Properties., Cross Correlation and Auto Correlation of Functions, Laplace Transforms, inverse Laplace Transforms and Region of Convergence (ROC) for Laplace Transforms.
5. Understand the concept of Sampling Theorem, Aliasing and Effect of Under Sampling.
6. Understand the Concept of Z- Transform of a Discrete Sequence, Distinction Between Laplace, Fourier and Z Transforms and Region of Convergence in Z-Transform

UNIT I: SIGNALS

Signals. Classification of Signals. Periodic. Non-periodic. Energy and Power Signals. Exponential and Sinusoidal Signals. Concepts of Impulse Function. Unit Step Function. Signum Function.

SIGNAL ANALYSIS - 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.

UNIT-II : FOURIER REPRESENTATION OF CONTINUOUS TIME SIGNALS

PERIODIC SIGNALS - Fourier Series. Properties of Fourier Series. Dirichlet’s Conditions. Trigonometric. Exponential & Compact (Cosine) Fourier Series. Fourier Spectrum.

NON- PERIODIC SIGNALS - Fourier Transforms. Deriving Fourier Transform from Fourier Series. Fourier Transform of Arbitrary Signal. Standard Signals. Fourier Transform of Periodic Signals. Properties of Fourier Transforms. Fourier Transforms Involving Impulse and Signum Functions. Introduction to Hilbert Transform.

UNIT-III: SIGNAL TRANSMISSION THROUGH LINEAR SYSTEMS

Systems. Classification of Systems. Linear System. Impulse Response (IR) of a Linear System. Linear Time Invariant (LTI) System. Linear Time Variant (LTV) System. Transfer Function of a LTI System. Filter Characteristics of Linear Systems. Distortion Less Transmission Through a System. Signal Bandwidth. System Bandwidth. Ideal LPF, HPF and BPF Characteristics. Causality and Poly-Wiener Criterion for Physical Realization. Relationship between Bandwidth and Rise Time.

UNIT-IV: CONVOLUTION AND CORRELATION OF SIGNALS

Concept of Convolution in Time Domain and Frequency Domain. Graphical Representation of Convolution. Convolution Properties. Cross Correlation and Auto 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.

LAPLACE TRANSFORMS - Review of Laplace Transforms. Partial Fraction Expansion. Inverse Laplace Transform. Concept of Region of Convergence (ROC) for Laplace Transforms. Constraints on ROC for Various Classes of Signals. Properties of LT. Relation between LT and FT of a Signal. Laplace Transform of Certain Signals using Waveform Synthesis. Laplace Transform of a Periodic Signals.

UNIT-V: SAMPLING

Sampling Theorem. Graphical and Analytical Proof for Band Limited Signals. Impulse(Ideal) Sampling. Natural(Chopped) Sampling and Flat Top(S&H) Sampling. Reconstruction of Signal from its Samples. Effect of Under Sampling . Aliasing. Introduction to Band Pass Sampling.

UNIT-VI: Z–TRANSFORMS

Fundamental Difference Between Continuous and Discrete Time Signals. Discrete Time Signal Representation using Complex Exponential and Sinusoidal Components. Periodicity of Discrete Time using Complex Exponential Signal. Concept of Z- Transform of a Discrete Sequence. Distinction Between Laplace, Fourier and Z Transforms. Region of Convergence in Z-Transform. Constraints on ROC for Various Classes of Signals. Inverse Z-Transform. Properties of Z-Transforms. Introduction to Discrete Time Systems. Applications of DT Systems Analysis and Synthesis.

Text Books

1. Linear Systems and Signal Processing – B.P Lathi Oxford Publications.
2. Signals and Systems – A.V. Oppenheim, A.S. Willsky and S.H. Nawab, PHI, 2nd Edn.

References

1. Signals & Systems – Simon Haykin and Van Veen,Wiley, 2nd Edition.

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(Code: 3EC03)

B. Tech. III Year I semester
JAVA PROGRAMMING
 (COMMON TO ME, EEE, BT, ECE)
 (OPEN ELECTIVE-I)

Course Outcomes :

- Understand the concept of OOP as well as the purpose and usage of principles of inheritance, Identify classes, objects, members of a class and the relationships among them needed for a specific problem.
- Understand and implement concepts of polymorphism, encapsulation and method overloading.
- Create Java application programs using sound OOP practices (e.g., interfaces and APIs) and proper program structuring (e.g., by using access control identifiers, automatic documentation through comments)
- Students understand and implement error exception handling and multi-threading.
- Students learn to create GUI and write programs for event-handling using various user interface components on applets.

UNIT-I

History of Java, Java buzzwords, data types, variables, simple java program, scope and life time of variables, operators, expressions, control statements, type conversion and costing, arrays, classes and objects – concepts of classes, objects, constructors, methods, access control, this keyword, overloading methods and constructors, string handling, String Tokenizer.

Objective: On the completion of the unit, a student should be able to: i) Write ,compile and execute simple java programs ii) Understand the syntax of classes and objects creation in java iii) Explain the differences between classes and objects iv) differentiate methods and constructors v) Understand constructor and method overloading vi) Understand how to handle strings in java

UNIT-II

Inheritance –Definition, single inheritance, benefits of inheritance, Member access rules, super class, polymorphism- method overriding, Dynamic method dispatch, using final with inheritance, abstract class, Base class object.

Objective:

On the completion of the unit, a student should be able to: i) Explain the benefits of inheritance ii) Understand how to access members of super class from subclass iii) Differentiate static and dynamic polymorphism iv) Understand the usage of final keyword in inheritance v) Understand the use of abstract class

UNIT-III

Interfaces : definition, variables and methods in interfaces , differences between classes and interfaces, usage of implements and extends keyword, uses of interfaces.

Packages: Definition, types of packages, Creating and importing a user defined package.

Applications using interface

Applications using packages

Objective:

On the completion of the unit, a student should be able to: i) Understand uses of interfaces and packages ii) Understand how to implement multiple inheritance in java iii) Explain the difference between classes and interfaces iv) Create and import packages

UNIT-IV

Exception handling -exception definition, benefits of exception handling, exception hierarchy, usage of try, catch, throw, throws and finally, built in exceptions, creating user defined exceptions.

Multi-Threading:-Thread definition, types of multitasking, uses of multitasking, thread life cycle, creating threads using Thread class and Runnable interface, synchronizing threads, daemon thread.

Applications of multithreading.

Objective:

On the completion of the unit, a student should be able to: i) Understand benefits of exception handling ii) Handle built-in and user defined exceptions iii) Understand the uses of multi-threading iv) Create multi-threaded programs using either Thread class or Runnable interface v) Know how to synchronize threads

UNIT-V

Advantages of GUI over CUI ,The AWT class hierarchy, Component, Frame, user interface components- labels, button, scrollbars, text components, check box, check box groups, choices, lists panels – scrollpane, menubar, graphics, layout, managers –boarder, grid, flow and card layouts.

Applications: developing calculator, developing feedback form, developing biodata.

Objective:

On the completion of the unit, a student should be able to: i) understand the advantages of GUI over CUI ii) Write GUI programs

UNIT-VI

Event handling: Delegation event model, closing a Frame, mouse and keyboard events, Adapter classes.

Applets – Concepts of Applets, differences between applets and applications, life cycle of an applet, types of applets, creating applets, passing parameters to applets.

Applications: Developing of simple advertisements.

Objective:

On the completion of the unit, a student should be able to: i) Able to handle events using delegation event model

ii) Write applet programs

TEXT BOOKS

1. Java; the complete reference, 6th editon, Herbert schildt, TMH.
2. Introduction to Java programming 6th edition, Y. Daniel Liang, pearson education.

REFERENCES

1. Core Java 2, Vol 1, Fundamentals, Cay.S.Horstmann and Gary Cornell, 7th Edition, Pearson Education.
2. Core Java 2, Vol 2, Advanced Features, Cay.S.Horstmann and Gary Cornell,7th Edition, Pearson Education

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III Year B.Tech EEE - I Sem

(CODE: 3DC01) DISCRETE STRUCTURES AND GRAPH THEORY (Common to ECM & EEE) (OPEN ELECTIVE-I)

UNIT-I

Propositional Logic: Statements and notations, Connectives, Well formed formulas, Truth Tables, tautology, equivalences, implications, Arguments, Normal forms, proof of contradiction, Conditional proof.

UNIT-II

First order logic: Predicates, Quantifiers, Free & Bound variables, Rules of inference, Consistency, Automatic Theorem Proving.

UNIT-III

Relations: Properties of Binary Relations, equivalence, transitive closure, compatibility and partial ordering relations, Hasse diagrams, Lattices, Boolean algebras. Functions: Inverse Function, Composition of functions, recursive Functions

Algebraic structures: Algebraic systems, Examples and general properties, Semi groups and monoids, groups, sub groups, homomorphism, Isomorphism.

UNIT-IV

Elementary Combinatorics : Basics of counting, Combinations & Permutations with and without repetitions, Constrained repetitions, Binomial Coefficients, Binomial & Multinomial theorems, Euler function, Derangements, Principles of Inclusion – Exclusion, Pigeon hole principle and its applications

UNIT-V

Recurrence Relations : Generating Functions, Function of Sequences, Calculating Coefficient of generating function, Recurrence relations, Solving recurrence relation by substitution and Generating functions. Characteristics roots, Solution of in-homogeneous recurrence Relations.

UNIT-VI

Graph Theory : Basic Concepts, Representation of Graph, DFS, BFS, Spanning trees, Planar graphs, Coloring, Isomorphism and Sub graphs, Multi graphs and Euler circuits, Hamiltonian graphs, Chromatic Numbers, Connectivity, Cut vertices, cut edges, Matchings and coverings, Independent sets.

TEXT BOOKS:

1. Elements of Discrete mathematics – A computer Oriented Approach- C L Liu, D P Mohapatra. Third Edition, Tata McGraw Hill.
2. Discrete Mathematics for Computer Scientists & Mathematicians, J.L. Mott, A. Kandel, T.P. Baker, PHI.
3. Discrete mathematics with applications to computer science, J.P.Tremblay and R.Manohar, TMH

REFERENCES:

1. Discrete and Combinational Mathematics- An Applied Introduction-5th Edition – Ralph. P.Grimaldi.Pearson Education
2. Discrete Mathematics and its Applications, Kenneth H. Rosen, Fifth Edition.TMH.
3. Discrete Mathematical structures Theory and application-Malik & Sen, Cengage.

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III Year B.Tech EEE - I Sem

VLSI DESIGN

(Common to ECM, ECE, EEE, CSE & IT)

(OPEN ELECTIVE-I)

UNIT I

INTRODUCTION : Introduction to IC Technology & Fabrication Process – Oxidation, Lithography, Diffusion, Ion implantation, Metallisation, Encapsulation, Probe testing, Integrated Resistors and Capacitors.

UNIT II

BASIC ELECTRICAL PROPERTIES : Basic Electrical Properties of MOS, PMOS, NMOS, CMOS & BiCMOS Circuits and their comparisons, Pass transistor.

INVERTERS: NMOS Inverter, Various pull ups, CMOS Inverter analysis and design, Bi-CMOS Inverters.

UNIT III

VLSI CIRCUIT DESIGN PROCESSES: VLSI Design Flow introduction (Abstraction levels, Simulation and synthesis, Physical Design, DRC, LVS, Extraction, verification and fabrication), MOS Layers, Stick Diagrams, Design Rules and Layout (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

DELAYS : Sheet Resistance RS and its concept to MOS, Area Capacitance Units, Calculations - □□- Delays, Driving large Capacitive Loads, Wiring Capacitances, Fan-in and fan-out, Choice of layers

UNIT V

GATE & SUBSYSTEM DESIGN: Logic Gates and Other complex gates, Switch logic, Alternate gate circuits, Basic circuit concepts, Subsystem Design, Shifters, Adders, ALUs, Multipliers, Parity generators, Comparators, Zero/One Detectors, Counters, High Density Memory Elements.

UNIT VI

INTRODUCTION TO SEMICONDUCTOR ICs : Programmable devices – PALs, PLAs, FPGAs, CPLDs, Custom & Semi-custom design, Standard Cells.

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.

TEXTBOOKS :

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

REFERENCES :

1. Chip Design for Submicron VLSI: CMOS Layout & Simulation, - John P. Uyemura, Thomson Learning.
2. Introduction to VLSI Circuits and Systems - John .P. Uyemura, JohnWiley, 2003.
3. Digital Integrated Circuits - John M. Rabaey, PHI, EEE, 1997.
4. Modern VLSI Design - Wayne Wolf, Pearson Education, 3rd Edition, 1997.
5. VLSI Technology – S.M. SZE, 2nd Edition, TMH, 2003.

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III Year B.Tech EEE - I Sem
(CODE: 3DC06) EMBEDDED & REAL TIME SYSTEMS
(Common to ECM, ECE & EEE)
(OPEN ELECTIVE-I)

UNIT – I

Introduction to Embedded Systems: Introduction, Complex Systems and Microprocessor, Embedded System Design Process, Formalisms for System Design (Ch 1 of Wolf) Design challenge, processor technology, IC technology, Design Technology, Trade-offs. (Ch 1 Frank)

UNIT – II

8051 Programming and Interfacing: 8051 Architecture, features, LCD Interfacing, Stepper Motor Interfacing, DC motor Interfacing Using PWM. (Ch 1, 10, 11 Mazidi)

UNIT – III

Introduction to Advanced Architecture: ARM Processor and Memory Organization, Programmer's Model, Instruction set, Instruction level Parallelism, Programming Input and output, Supervisor Mode, exceptions and Traps. (Ch2, 3 Wolf)

UNIT – IV

Interfacing with ARM : LCD Interfacing, Stepper Motor Interfacing, DC motor Interfacing Using PWM, I²C and SPI protocol.

Networked Embedded Systems: Bus Protocols, I²C bus, CAN bus, Ethernet Enabled Systems, Design Example- Elevator Controller. (Ch8 Wolf)

UNIT – V

Introduction to Real-Time Systems: Tasks and Task States, Tasks and Data, Semaphores, and Shared Data; Message Queues, Mailboxes and Pipes, Timer Functions, Events, Memory Management, Interrupt Routines in and RTOS Environment. (Ch6 & 7 Simon).

UNIT – VI

Basic Design Using a Real-Time Operating System : Principles, Semaphores and Queues, Hard Real-Time Scheduling Considerations, Saving Memory and Power, An example RTOS uC-OS / Vx-Works / RT Linux; Embedded Software Development Tools: Host and Target machines, Linker/Locators for Embedded Software, Getting Embedded Software into the Target System; Debugging Techniques: Testing on Host Machine (Ch 8, 9 & 10 Simon).

TEXT BOOKS:

1. Computers and Components: principles of embedded *computing* system design, Wayne Wolf, Elsevier.
2. Embedded System Design – A Unifies Hardware/Software introduction - Frank Vahid, Tony D. Givargis, John Wiley, 2002.
3. The 8051 Microcontroller And Embedded Systems Using Assembly And C – Mazidi, Pearson Education India, 2nd edition, 2008.
4. An Embedded Software Primer, David E. Simon, Pearson Education.
5. ARM reference manual.

REFERENCES:

1. Embedded Systems, Raj Kamal, TMH.
2. LPC2148 ARM7 Microcontroller Manual.
3. ARM Microcontroller Interfacing Hardware and Software, Warwick A Smith, Elkator
4. ARM Microcontroller Part1: 35 Projects for Beginners, Bert Van Dam, Elkator
5. 8051 Application Notes by Atmel.

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III Year B.Tech EEE - I Sem
PRODUCT DESIGN & SERVICE
(OPEN ELECTIVE-I)

Unit I : Introduction to Design Thinking:

Product Research, Art, Design and Society - Creativity and Brain-storming for Design – Nature of Technology Entrepreneurship, Characteristics/Qualities, Skills of Technology Entrepreneur, IPR relating to Designs and Registration of Industrial Designs

Unit II : Introduction to Service Design:

Challenges & Critical Success Factors, Requirements Engineering, Service Design Process, Tools for Service Design, Mapping the Customer Journey; Tools for Innovation, Conjoint Analysis, Voice of Customer Methods.

Product Features, Attributes of a Good Design, Design Elements : Usability, Aesthetics, Functionality

Unit III : Introduction to Product Design:

Product Architecture and Modularity, Product Innovation, Products and Product Suites, Product Development, Process Development, Value Engineering, Product Design Specifications, Principles of Ergonomics.

Unit IV : Design for Manufacturing:

Re-manufacturing, Sustainability, Design for Environment, Reliability and Robustness, Safety Considerations, Quality Aspects, Design for Serviceability.

Unit V : System & Engg Design:

Physical Models and Experimentation, Prototype development, Bill of Materials, Interface of Materials, Processes and Designs, Codes & Standards

Unit VI : Design Methodology:

Live Design & Design Tools – Design Structure, Matrix Modeling, Product Metrics, Concurrent Engineering, CAD/CAM, Design Review

TEXT BOOKS:

- 1) Kevin Otto & Kristie Wood, “Product Design”, Peason Education, 2011
- 2) Prashant Kumar, “Creativity, Concepts and Usability”, PHI, 2012

REFERENCES:

- 1) Yousef Haik, “Engg Design Process” Thomson Brodes / Codel.
- 2) N F M Roozenburg I.Eekels, “Product Design Fundamentals and Methods” Wiley Publications.
- 3) Nigel Cross, “Engineering Design Methods: Strategies for Product Design”, Wiley, 2008.

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III Year B.Tech EEE - I Sem
ENTREPRENEURSHIP
(OPEN ELECTIVE-I)

(CODE: 4ZC04)

Course Objective: The objective of the course is to make students understand the nature of Entrepreneurship, and its importance to business to the engineering students, which will allow them to get the required intuition and interest in starting their own start-up's

UNIT I

INTRODUCTION TO ENTREPRENEURSHIP: Definition of entrepreneurship, Evolution of entrepreneurship, Classification of Entrepreneurs, Entrepreneurship as a Process, Entrepreneurial Propensity, Benefits and Drawbacks of Entrepreneurship. Characteristics of entrepreneur, Qualities and skills, functions of entrepreneur. Women Entrepreneurs, Problems and opportunities.

UNIT II

FORMS OF ENTREPRENEURSHIP: Small Business, Importance in Indian Economy, Types of ownership, sole trading, partnership, Joint Stock Company, Important features of Various types of businesses, corporate entrepreneurship, entrepreneurship, Role of Government in the promotion of Entrepreneur, State Enterprises in India.

UNIT III

EXPLORING OPPORTUNITIES AND STRATEGIES: Opportunity Analysis, SWOT Analysis, Internal and External Environment. First-Mover disadvantages, Risk Reduction strategies, Market scope strategy, Imitation strategies and Managing Newness, Marketing strategies for start-ups, Pitfalls in start-up analysis. Taxes as bottlenecks for the growth of new start-up's, subsidies and incentives given to save taxes

UNIT IV

BUSINESS PLAN AND FEASIBILITY STUDIES: Preparation of an Effective Business Plan, Contents of a Business Plan, Detailed discussion of the business plan. Model Business, Feasibility study, Environmental scanning, Economic Analysis, Industry Analysis, Competitive Analysis. Write Up for an effective feasible and bankable report.

UNIT V

INNOVATIONS AND PROTECTION OF IDEAS: Creativity process in developing Innovation, breakthrough innovations and its consequences on the society. Inspiring innovations. New product ideas, Idea generation methods, quality gates, prototype building, Test marketing. Protecting the ideas, Applying for Intellectual Property rights, Patents, Copyrights, Trademarks, Geographical Indicators. Introduction to World Intellectual Property Organization (WIPO).

UNIT VI

FINANCIAL ASPECTS OF THE ENTREPRENEURSHIP: Sources of Capital ,Debt and Equity, Commercial Banks, Angel Investors, Venture capitalist, IDBI,ICICI,IFCI,SFC'c. Government Grants and Subsidies. Registration Process and the documentation required. Government Agencies helping in Registration Process. DIC, NSIC and other Central and State Institutions.

References:

- H. Nandan, Fundamentals of Entrepreneurship, Prentice Hall of India, First Edition, New Delhi, 2007.
- Robert D Hisrich, Michael P Peters, Dean A Shepherd, Entrepreneurship, Sixth Edition, New Delhi, 2006.
- Alfred E. Osborne, Entrepreneur's Toolkit, Harvard Business Essentials, HBS Press, USA, 2005.
- Madhurima Lall, Shikha Sahai, Entrepreneurship, Excel Books, First Edition, New Delhi, 2006.
- S.S. Khanka, Entrepreneurial Development, S. Chand and Company Limited, New Delhi, 2007.
- Thomas W. Zimmerer, Norman M. Scarborough, Essentials of Entrepreneurship And Small Business Management, Fourth Edition, Pearson, New Delhi, 2006
- S.R. Bhowmik, M. Bhowmik, Entrepreneurship-A tool for Economic Growth And A key to Business Success, New Age International Publishers, First Edition, (formerly Wiley Eastern Limited), New Delhi, 2007

III Year B.Tech – I Sem
ELECTRICAL MACHINES - III

(CODE: 3A508)

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OBJECTIVE:

This subject is an extension of previous machines courses. It deals with the detailed analysis of Synchronous generators and motors which are the prime source of electrical power generation and its utilities. Also concerns about the different types of single phase motors which are having significant applications in house hold appliances and control systems.

UNIT – I CONSTRUCTION AND PRINCIPLE OF OPERATION OF SYNCHRONOUS GENERATOR:

Constructional Features, Armature windings, Integral slot and fractional slot windings, Distributed and concentrated windings, Distribution, Pitch and winding factors, E.M.F Equation.

UNIT-II SYNCHRONOUS GENERATOR CHARACTERISTICS:

Harmonics in generated e.m.f. Suppression of harmonics, Armature reaction, Leakage reactance, Synchronous reactance and impedance, Experimental determination, Phasor diagram, Load characteristics.

UNIT – III REGULATION OF SYNCHRONOUS GENERATOR:

Regulation by synchronous impedance method, M.M.F. method, Z.P.F. method and A.S.A. methods, Salient pole alternators, Two reaction analysis, Experimental determination of X_d and X_q (Slip test) Phasor diagrams, Regulation of salient pole alternators.

UNIT – IV PARALLEL OPERATION OF SYNCHRONOUS GENERATOR:

Synchronizing alternators with infinite bus bars, synchronizing power torque, parallel operation and load sharing, Effect of change of excitation and mechanical power input. Analysis of short circuit current wave form, Determination of sub-transient, Transient and steady state reactance's.

UNIT – V SYNCHRONOUS MOTORS:

Principal of operation, Phasor diagram, Power flow equation, Variation of current and power factor with excitation, Power circles, Synchronous condenser, Hunting and its suppression, Methods of starting.

UNIT – VI SINGLE PHASE AND SPECIAL MOTORS:

Single phase induction motor, constructional features, double revolving field theory, elementary idea of cross, Field theory, Split-phase motors, and Shaded pole motor. Principle & performance of A.C. Series motor, Universal motor, Stepper motor and reluctance motor.

Text Books

1. Electric Machines –I.J.Nagrath & D.P.Kothari, Tata Mc Graw-Hill Publishers, 7th Edition.
2. Electrical Machines - P.S. Bimbra, Khanna Publishers.

Reference Books:

1. The Performance and Design of A.C.Machines – M.G.Say, ELBS and Ptiman & Sons.
2. Electric Machinery – A.E. Fitzgerald, C.Kingsley and S.Umans, Mc Graw-Hill Companies, 5th edition.
3. Theory of Alternating Current Machinery - Langsdorf, Tata Mc Graw-Hill, 2nd edition.
4. Electromechanics-III (Synchronous and single phase machines) -S.Kamakashiah, Right Publishers.

(CODE: 3A509)

**III Year B.Tech – I Sem
POWER ELECTRONICS**

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OBJECTIVE:

With the advent of semiconductor devices, Revolution is taking place in the power transmission distribution and utilization. This course introduces the basic concepts of power semiconductor devices, Converters and choppers and their analysis.

UNIT – I POWER SEMI CONDUCTOR DEVICES:

Thyristors, Silicon Controlled Rectifiers (SCR’s), BJT, Power MOSFET, Power IGBT, DIAC, TRIAC, GTO and their characteristics. Basic theory of operation of SCR, Static characteristics, Turn on and turn off methods, Dynamic characteristics of SCR, Turn on and Turn off times, Salient points.

UNIT – II DEVICES AND COMMUTATION CIRCUITS:

Two transistor analogy, SCR, UJT firing circuit, Series and parallel connections of SCR’s, Snubber circuit details, Specifications and Ratings of SCR’s, BJT, IGBT.

UNIT – III SINGLE PHASE AND THREE PHASE CONTROLLED CONVERTERS:

Phase control technique, Single Phase Line commutated converters, Mid point and Bridge connections, Half controlled and Fully controlled converters, Derivation of average load voltage and current with R and RL loads, Three phase half controlled and fully controlled bridge converters with R and RL loads, Effect of Source inductance, Waveforms, Numerical Problems.

UNIT –IV AC VOLTAGE CONTROLLERS & CYCLO CONVERTERS:

AC voltage controllers, Single phase two SCR’s in anti parallel with R and RL loads, Derivation of RMS load voltage, current and power factor wave forms, Firing circuits, Numerical problems, Cyclo converters, Single phase mid point cyclo converters with Resistive and inductive load (Principle of operation only), Bridge configuration of single phase cyclo converter (Principle of operation only), Waveforms

UNIT – V CHOPPERS:

Choppers, Time ratio control and Current limit control strategies, Step down choppers Derivation of load voltage and currents with R, RL and RLE loads, Step up Chopper, load voltage expression Morgan’s chopper, Jones chopper and waveforms, AC Chopper, Problems.

UNIT – VI INVERTERS:

Inverters, Single phase inverter, Basic series inverter, Basic parallel Capacitor inverter bridge inverter, Waveforms, Simple forced commutation circuits for bridge inverters, Voltage control techniques for inverters, Pulse width modulation techniques (Multiple Pulse and Sinusoidal), Numerical problems.

TEXT BOOKS:

1. Power Electronics - M. D. Singh & K. B. Kanchandhani, Tata Mc Graw Hill Publishing Company.
2. Power Electronics Circuits, Devices and Applications - M. H. Rashid, Prentice Hall of India, 2nd edition.

REFERENCE BOOKS:

1. Power Electronics - Vedam Subramanyam, New Age International (P) Limited, Publishers.
2. Power Electronics - V.R.Murthy 1st edition, OXFORD University Press.
3. Power Electronics - P.C.Sen, Tata Mc Graw Hill Publishing.
4. Thyristorised Power Controllers - G. K. Dubey, S. R. Doradra, A. Joshi and R. M. K. Sinha, New Age International (P) Limited Publishers.
5. Power Electronics - P.S.Bimbhra, Khanna Publishers.

(CODE: 3A510)

**III YEAR B.TECH – I SEM
POWER SYSTEMS-II**

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OBJECTIVE:

This course introduces all varieties of Circuit Breakers and Relays for protection of Generators, Transformers and feeder bus bars from over voltages and other hazards. It emphasis on Neutral grounding for overall protection.

UNIT – I SHORT CIRCUIT ANALYSIS:

Per Unit System of Representation, Per Unit equivalent reactance network of a three phase Power System, Numerical Problems.

SYMMETRICAL FAULT ANALYSIS

Short Circuit Current and MVA Calculations, Fault levels, Application of Series Reactors, Numerical Problems.

SYMMETRICAL COMPONENT THEORY:

Symmetrical Component Transformation, Positive, Negative and Zero sequence components: Voltages, Currents and Impedances.

Sequence Networks: Positive, Negative and Zero sequence Networks, Numerical Problems.

UNSYMMETRICAL FAULT ANALYSIS:

LG, LL, LLG faults with and without fault impedance, Numerical Problems.

UNIT – II CIRCUIT BREAKERS:

Elementary principles of arc interruption, Restriking Voltage and Recovery voltages, Restriking Phenomenon, Average and Max. RRRV, Numerical Problems, Current Chopping and Resistance Switching, CB ratings and Specifications, Types and Numerical Problems, Auto reclosures.

Description and Operation of following types of circuit breakers, Minimum Oil Circuit breakers, Air Blast Circuit Breakers, Vacuum and SF6 circuit breakers.

UNIT – III ELECTROMAGNETIC AND STATIC RELAYS:

Principle of Operation and Construction of Attracted armature, Balanced Beam, Induction Disc and Induction Cup relays. Relays Classification, Instantaneous, DMT and IDMT types, Application of relays, Over current, Under voltage relays, Directional relays, Differential relays and Percentage Differential Relays.

Universal torque equation, Distance relays, Impedance, Reactance, Mho and Off-Set Mho relays, Characteristics of Distance Relays and Comparison

Static Relays, Static Relays verses Electromagnetic Relays. Microprocessor based relays.

UNIT – IV GENERATOR, TRANSFORMER, FEEDER AND BUS-BAR PROTECTION:

Protection of generators against Stator faults, Rotor faults, and Abnormal Conditions. Restricted Earth fault and Inter turn fault Protection. Numerical Problems on % Winding Unprotected.

Protection of transformers, Percentage Differential Protection, Numerical Problem on Design of CT s Ratio, Buchholtz relay Protection.

Protection of Lines, Over Current, Carrier Current and Three-zone distance relay protection using Impedance relays. Translay Relay. Protection of Bus bars, Differential protection.

UNIT – V PROTECTION AGAINST OVER VOLTAGES:

Generation of Over Voltages in Power Systems, Protection against Lightning Over Voltages ,Valve type and Zinc-Oxide Lighting Arresters, Insulation Coordination -BIL, Impulse Ratio, Standard Impulse Test Wave, Volt-Time Characteristics.

UNIT-VI NEUTRAL GROUNDING:

Grounded and Ungrounded Neutral Systems, Effects of Ungrounded Neutral on system performance.

Methods of Neutral Grounding, Solid, Resistance, Reactance, Arcing Grounds.

TEXT BOOKS:

1. Switchgear and Protection – Sunil S Rao, Khanna Publishers.
2. Power System Protection and Switchgear – Badri Ram, D.N Viswakarma, TMH Publications.

REFERENCE BOOKS:

1. Fundamentals of Power System Protection –Paithankar and S.R.Bhide.,PHI.
2. Art & Science of Protective Relaying – C R Mason, Wiley Eastern Ltd.
3. Electrical Power Systems – C.L.Wadhwa, New Age international (P) Limited, Publishers, 3rd edition.
4. A Text book on Power System Engineering – B.L.Soni, Gupta, Bhatnagar, Chakrabarthy, Dhanpat Rai & Co.

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(CODE: 3HC76)

III Year B.Tech. I Semester
QUANTITATIVE APTITUDE
(Common to All Branches)

Unit I

Number System: Test for Divisibility, Test of prime number, Division and Remainder – HCF and LCM of Numbers - Fractions.

Unit II

Average: Average of different groups, Replacement of some of the items - Percentage - Profit and Loss.

Unit III

Ratio and Proportion: Properties of Ratio, Comparison of Ratios, Useful Simple Results on Proportion – Partnership and Share.

Unit IV

Simple Interest: Effect of change of P, R and T on Simple Interest - Compound Interest: Conversion Period, Difference between Compound Interest and Simple Interest.

Unit V

Time and Work- Pipes and Cisterns, Time and Distance- Problems on Trains- Boats and Streams, Allegation or Mixtures.

Unit VI

Mensuration: Area of Plane Figures, Volume and Surface Area of Solid Figures.
Data Interpretation: Tabulation, Bar Graphs, Pie Charts, Line Graphs.

Text Books:

1. Quantitative Aptitude by R.S.Agarwal
2. Quantitative Aptitude by Abhijit Guha

(CODE: 3A574)

**B. Tech. III Year I Semester
GROUP PROJECT**

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A group project shall be carried out by a group of students consisting of 2 to 3 in number in third Year first semester. This work shall be carried out under the guidance of the teacher and shall involve design, fabrication, software development or any other significant activity. This can be of interdisciplinary nature also. There will be 75 marks in total with 25 marks of internal evaluation.

The **internal evaluation** shall consist of:

Day to day work	10 marks
Report	05 marks
Demonstration / presentation	10 marks
End examination	50 Marks.

The end examination will be carried out by a committee consisting of an external examiner, head of the department, a senior faculty member and the supervisor.

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III Year B.Tech.EEE - I Sem
(CODE: 3C573) LINEAR AND DIGITAL IC APPLICATIONS LAB

Part A (Linear IC Application Lab):

Verify the operations of the Analog ICs (Hardware) in the Laboratory (At least Six Experiments)

1. OP AMP Applications – Adder, Subtractor, Comparator Circuits.
2. Active Filter Applications – LPF, HPF (first order)
3. Function Generator using OP AMPs.
4. 4 bit DAC using OP AMP.
5. IC 555 Timer – Monostable and Astable Operation Circuit.
6. IC 566 – VCO Applications.
7. Phase Locked Loop

Part B (Digital IC Application Lab):

Verify the operations of the Digital ICs (Hardware) in the Laboratory (At least Six Experiments)

1. 3x8 Decoder using IC 74x138
2. 8 x1 Multiplexer using IC 74x151
3. 4-bit Binary Adder using IC 74x283
4. Priority encoder using 74x148
5. D Flip-Flop IC 74x74
6. Decade counter using IC74x90
7. Shift registers using 74x194

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III Year B.Tech – I Sem
(CODE: 3A575) CONTROL SYSTEMS AND SIMULATION LAB

Any Eight of the following experiments are to be conducted:

1. Time response of Second order system
2. Characteristics of Synchros
3. Programmable logic controller – Study and verification of truth tables of logic gates, simple Boolean expressions and application of speed control of motor.
4. Effect of feedback on DC servo motor
5. Transfer function of DC motor
6. Effect of P, PD, PI, PID Controller on a second order systems
7. Lag and lead compensation – Magnitude and phase plot
8. Transfer function of DC generator
9. Temperature controller using PID
10. Characteristics of magnetic amplifiers
11. Characteristics of AC servo motor

Any two simulation experiments are to be conducted:-

1. PSPICE simulation of Op-Amp based Integrator and Differentiator circuits.
2. Linear system analysis (Time domain analysis, Error analysis) using MATLAB.
3. Stability analysis (Bode, Root Locus, Nyquist) of Linear Time Invariant system using MATLAB
4. State space model for classical transfer function using MATLAB – Verification.

REFERENCE BOOKS:

1. Simulation of Electrical and electronics Circuits using PSPICE –M.H.Rashid, M/s PHI Publications.
2. PSPICE A/D user’s manual – Microsim, USA.
3. PSPICE reference guide – Microsim, USA.
4. MATLAB and its Tool Books user’s manual and – Mathworks, USA.

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III Year B.Tech – I Sem
(Code: 3A585) TECHNICAL PAPER WRITING AND SEMINAR-I

There shall be a technical seminar evaluated for 25 marks in fourth year second semester. The evaluation is purely internal and will be conducted as follows:

Preliminary Report on progress of the work and viva	05 marks
Final report	05 marks
Presentation and Defence before a departmental committee Consisting of Head, a senior faculty and supervisor	15 marks

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III Year B.Tech – II Sem
(CODE:3ZC02) MANAGEMENT SCIENCE

Course Objective: The course is aimed at giving the basics of management, its principles, practices and latest concepts for increasing the performance of engineering graduates in their respective fields.

UNIT I

INTRODUCTION TO MANAGEMENT: Management- Definitions, Fayol’s principles of Management, Levels of Management, functions of management. Planning: types of planning, planning process; Organizing: Organizational Design and structure, staffing; Directing; Maslow’s Motivational theory, Leadership styles, Controlling: Basic control process.

UNIT II

INTRODUCTION TO OPERATIONS MANAGEMENT: Plant Location, plant layout, types of production, Work Study, Method study and Work Measurement, Basic Procedures Project Management: Network Analysis - Programme Evaluation and Review Techniques, Critical Path Method, Crashing of Simple Networks.

UNIT III

MATERIALS MANAGEMENT: Objectives of Materials, Need for Inventory Control, Economic Order Quantity, ABC Analysis, Inventory Control Systems, Just In Time, Introduction to LSCM, Quality Control Techniques– Inspection, ISO standards, Six Sigma.

UNIT IV

(i) Human Resources Management: Objectives of HRM, Challenges of HRM, HR Planning process HR functions and policies – Recruitment, Selection, Training and Development, Performance Appraisal, Balanced Score Card.

(ii) Marketing Management: Concept of Marketing, Functions, Marketing Mix, Product Life Cycle, Marketing Strategies, Channels of Distribution, Differences between products and services.

UNIT V

INTRODUCTION TO ORGANIZATIONAL BEHAVIOR: Definition, Nature and Scope, Perception – Perceptual selectivity and organization, Personality and Attitudes, Determinants of personality Formation of Attitudes-, Perceptual Distortions Attribution analysis Attribution theories, Johari Window and Transactional Analysis.

UNIT VI

STRATEGIC MANAGEMENT: Concepts in Strategic Management, Vision, Mission, Objectives, SWOT Analysis, Concept of Strategic Planning, Competitive Advantage, Concept of Core Competence; An overview, Process and its Implementation, Target Setting, Types of strategies, strategy formulation; Implementation.

TEXT BOOK:

- A R Aryasri: Management Science, Tata Mc Graw Hill

REFERENCE BOOKS:

- Dr. Y. Satyanarayana: Management control systems in competitive environment,
- Koontz & Wehrich: Essentials of Management, 6/e, TMH, 2005
- Kotler Philip & Keller Kevin Lane: Market Management 12/e, PHI, 2005
- 5 Strategic Management, Text and Cases, VSP Rao, V Hari Krishna
- Thomas N Duening & John M. Ivancevich Management – Principles and Guidelines

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III Year B. Tech. EEE - II Sem
(CODE: 3DC05) MICROPROCESSORS AND MICROCONTROLLERS
(Common to ECM, ECE & EEE)

UNIT – I

Microprocessor Architecture: Introduction to 8085: Features, Architecture; Architecture of 8086 Microprocessor. Special functions of General purpose registers. 8086 flag register and function of 8086 Flags. Addressing modes of 8086. Instruction set of 8086. Assembler directives, simple programs, procedures and macros.

UNIT - II

Assembly Language Programming Concepts: Assembly language programs involving logical, Branch & Call instructions, sorting, evaluation of arithmetic expressions, string manipulation. Pin diagram of 8086-Minimum mode and Maximum mode of operation. Timing diagram.

UNIT – III

Basic memory and I/O Interfacing: Memory interfacing to 8086 (Static RAM & EPROM). 8255 PPI – various modes of operation and interfacing to 8086. Interfacing Keyboard, Displays, Stepper Motor and actuators. D/A and A/D converter interfacing.

UNIT – IV

Advanced interrupts and serial port interfacing for 8086: Interrupt structure of 8086. Vector interrupt table. Interrupt service routines. Introduction to DOS and BIOS interrupts. 8259 PIC Architecture and interfacing cascading of interrupt controller and its importance. 8251 USART Architecture. RS.232, sample programs of serial Data Transfer.

UNIT -V

Microcontroller Architecture and Programming: Introduction, 8051 Micro controller Hardware, Input/Output Ports and Circuits, External Memory, Counter and Timers, Serial data, Input/Output, Interrupts; The Assembly Language programming Process, Programming the 8051, Data Transfer and Logical Instructions. Arithmetic Operations, Decimal Arithmetic. Jump and Call Instructions, use of C programming for 8051.

UNIT - VI

Microcontroller Interfacing: Interfacing 8051 with Keyboards, Displays (LED,LCD), D/A and A/D Conversions, Multiple Interrupts. Serial Data Communication., Stepper motors, DC motors.

TEXT BOOKS :

- Advanced microprocessor and Peripherals - A.K.Ray and K.M.Bhurchandi, TMH, 2000.
- Microprocessors and interfacing – Douglas V. Hall, TMH, 2nd Edition, 1999.
- 8051 Microcontroller – Kenneth J. Ayala, Penram International/ Thomson, 3rd Edition, 2005.
- The 8051 Microcontroller And Embedded Systems Using Assembly And C – Mazidi, Pearson Education India, 2nd edition, 2008.

REFERENCES :

- Micro computer systems, The 8086/8088 Family Architecture, Programming and Design – Y.Liu and G.A. Gibson, PHI, 2nd Edition.
- 8051 Micro Controllers and Embedded Systems – Dr. Rajiv Kapadia, Jaico Publishers.

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III Year B. Tech. EEE - II Sem
(CODE: 3DC03) COMPUTER ORGANIZATION
(Common to ECM, ECE, EEE & IT)

UNIT - I

Basic Structure of Computers: Computer Types, Functional unit, Basic operational concepts, Bus structures, Software, Performance, multiprocessors and multi computers. Data Representation. Fixed Point Representation. Floating – Point Representation. Error Detection codes.

UNIT - II

Register Transfer Language and Micro-operations: Register Transfer language. Arithmetic Micro-operations, logic micro-operations, shift micro operations, Arithmetic logic shift unit. Instruction codes. Computer Registers; Computer instructions – Instruction cycle. memory – Reference Instructions. Input – Output and Interrupt; STACK organization; Instruction formats; Addressing modes: Data Transfer and manipulation, Program control.

UNIT - III

Control Unit Design: Control memory, Address sequencing, micro-program example, design of control unit, Hard wired control, Micro-programmed control.

Pipelining: Parallel processing, pipelining, arithmetic Pipeline, Instruction pipeline, RISC Pipeline.

UNIT - IV

Computer Arithmetic & Logic Operations : Addition and subtraction, multiplication Algorithms, Division Algorithms, Fixed & Floating – point Arithmetic operations, AND, OR, NOT & XOR operations.

UNIT - V

The Memory System : Basic concepts semiconductor RAM memories. Read-only memories Cache memories performance considerations, Virtual memories secondary storage. Memory management and MMU.

UNIT - VI

Input-Output Organization : Peripheral Device, Input-Output Interface, Asynchronous data transfer Modes of Transfer, Priority Interrupt, Direct memory Access, Input-Output processor (IOP), Serial communication; Introduction to Peripheral Component Interconnect (PCI) bus. Introduction to standard serial communication protocols like RS232, USB, IEEE1394.

TEXT BOOKS:

1. Computer Organization – Carl Hamacher, Zvonks Vranesic, SafeaZaky, Vth Edition, McGraw Hill.
2. Computer Systems Architecture – M.Moris Mano, IIIrd Edition, Pearson/PHI.
3. Computer Organization and Architecture – William Stallings Sixth Edition, Pearson/PHI.

REFERENCES:

1. Computer Architecture a quantitative approach–Henessey, Patterson, Fourth Edition, Elsevier.
2. Computer Architecture: Fundamentals and principles of Computer Design, Joseph D. Dumas II, BS Publication.

**III Year B.Tech – II Sem
POWER SYSTEMS - III**

(CODE: 3A611)

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OBJECTIVE:

This subject deals with Economic operation of Power Systems, Hydrothermal scheduling and modeling of turbines, generators and automatic controllers. It emphasizes on single area and two area load frequency control and reactive power control.

UNIT -I POWER SYSTEM NETWORK MATRICES:

Graph Theory: Definitions, Bus Incidence Matrix, Y_{Bus} formation by Direct and Singular Transformation Methods, Numerical Problems.

FORMATION OF Z_{BUS} : Partial network, Algorithm for the Modification of Z_{BUS} Matrix for addition element for the following cases: Addition of element from a new bus to reference, Addition of element from a new bus to an old bus, Addition of element between an old bus to reference and Addition of element between two old busses (Derivations and Numerical Problems), Modification of Z_{BUS} for the changes in network (Problems).

UNIT –II MODELLING OF TURBINE, GENERATOR AND AUTOMATIC CONTROLLERS:

Modeling of Turbine: First order Turbine model, Block Diagram representation of Steam Turbines and Approximate Linear Models- Modeling of Generator (Steady State and Transient Models), Description of Simplified Network Model of a Synchronous Machine (Classical Model), Description of Swing Equation (No Derivation) and State-Space II-Order Mathematical Model of Synchronous Machine - Modeling of Governor, Mathematical Modeling of Speed Governing System, Derivation of small signal transfer function - Modeling of Excitation System, Fundamental Characteristics of an Excitation system, Transfer function- Block Diagram Representation of IEEE Type-1 Model.

UNIT – III LOAD FREQUENCY CONTROL:

Necessity of keeping frequency constant- Definitions of Control area, Single area control, Block diagram representation of an isolated power system, Steady state analysis, Dynamic response, uncontrolled case. Load frequency control of 2-area system, uncontrolled case and controlled case, tie-line bias control. Proportional plus Integral control of single area and its block diagram representation, steady state response, Load Frequency Control and Economic dispatch control.

UNIT –IV POWER FLOW STUDIES:

Necessity of Power Flow Studies, Data for Power Flow Studies, Derivation of Static load flow equations, Load flow solutions using Gauss Seidel Method, Acceleration Factor, Load flow solution with and without P-V buses, Algorithm and Flowchart. Numerical Load flow Solution for Simple Power Systems (Max. 3-Buses), Determination of Bus Voltages, Injected Active and Reactive Powers (Sample One Iteration only) and finding Line Flows/Losses for the given Bus Voltages. Newton Raphson Method in Rectangular and Polar Co-Ordinates Form - Load Flow Solution with or without PV Busses - Derivation of Jacobian Elements - Algorithm and Flowchart - Decoupled and Fast Decoupled Methods, Comparison of Different Methods, DC load Flow.

UNIT –V POWER SYSTEM STEADY STATE STABILITY ANALYSIS:

Elementary concepts of Steady State, Dynamic and Transient Stabilities. Description of: Steady State Stability Power Limit, Transfer Reactance, Synchronizing Power Coefficient, Power Angle Curve and Determination of Steady State Stability and Methods to improve steady state stability. Derivation of Swing Equation - Determination of Transient Stability by Equal Area Criterion, Application of Equal Area Criterion, Critical Clearing Angle Calculation - Solution of Swing Equation: Point-by-Point Method. Methods to improve Stability - Application of Auto Reclosing and Fast Operating Circuit Breakers.

UNIT – VI REACTIVE POWER CONTROL:

Overview of Reactive Power control, Reactive Power compensation in transmission systems, advantages and disadvantages of different types of compensating equipment for transmission systems, load compensation, Specifications of load compensator, Uncompensated and compensated transmission lines: shunt and Series Compensation.

TEXT BOOKS:

1. Electrical Power Systems – C.L.Wadhwa, Newage International, 3rd Edition.
2. Modern Power System Analysis –I.J.Nagrath & D.P.Kothari, Tata Mc Graw Hill Publishing Company Ltd, 2nd edition.

REFERENCE BOOKS:

1. Power System Analysis and Design – J.Duncan Glover and M.S.Sarma., THOMPSON, 3rd Edition.
2. Electric Energy systems Theory – O.I.Elgerd, Tata Mc Graw Hill Publishing Company Ltd., Second edition.
3. Power System Analysis – Grainger and Stevenson, Tata McGraw Hill.
4. Power System Analysis – Hadi Saadat, Tata Mc Graw Hill Publishing Edition.

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III Year B.Tech – II Sem

(CODE: 3A612)

MEASUREMENTS & INSTRUMENTATION

OBJECTIVE:

Electrical measurements course introduces the basic principles of all measuring instruments. It also deals with the measurement of RLC parameters voltage, current Power factor, power, energy and magnetic measurements. Instrumentation is essential in monitoring and analysis of any Physical system and its control. This course deals with different types of transducers, digital voltmeters, oscilloscopes and measurement of non electrical quantities.

UNIT-I MEASURING INSTRUMENTS- INSTRUMENT TRANSFORMERS:

Classification - Deflecting, Control and Damping torques, Ammeters and Voltmeters, PMMC, Moving iron type instruments, Expression for the Deflecting torque and Control torque, Errors and Compensations, Extension of range using Shunts and Series resistance. CT and PT, Ratio and phase angle errors, Design considerations Type of P.F. Meters, Dynamometer and Moving iron type, 1- ph and 3-ph meters.

UNIT –II MEASUREMENT OF POWER& ENERGY:

Single phase dynamometer wattmeter-LPF and UPF-Double element and three element dynamometer wattmeter, Expression for deflecting and control torques, Extension of range of wattmeter using instrument transformers, Measurement of active and reactive powers in balanced and unbalanced systems, Single phase induction type energy meter, Driving and braking torques, Testing by phantom loading, Three phase energy meter .

UNIT - III MEASUREMENT OF RESISTANCE - MAGNETIC MEASUREMENTS- A.C. BRIDGES:

Principle and operation of D.C. Crompton's potentiometer, Standardization, Measurement of unknown resistance, current, voltage. Method of measuring low- Medium and High resistance, sensitivity of Wheatstone's bridge, Carey Foster's bridge, Kelvin's double bridge for measuring low resistance, Measurement of high resistance, loss of charge method, Measurement of inductance, Quality Factor, Maxwell's bridge, Hay's bridge, Anderson's bridge, Owen's bridge. Measurement of capacitance and loss angle, Desauty bridge, Wien's bridge, Schering Bridge.

UNIT-IV SIGNALS AND THEIR REPRESENTATION- CHARACTERISTICS:

Measuring Systems, Performance Characteristics, Static characteristics, Dynamic Characteristics, Errors in Measurement, Gross Errors-Systematic Errors, Statistical Analysis of Random Errors. Signal and their representation, Standard Test, periodic, a periodic, modulated signal, sampled data, pulse modulation and pulse code modulation.

UNIT-V DIGITAL VOLTMETERS- SIGNAL ANALYZERS- TRANSDUCERS:

Digital voltmeters, Successive approximation, Ramp, Dual slope integration continuous balance type, Micro processor based ramp type DVM digital frequency meter, Digital phase angle meter, Wave Analyzers, Frequency selective analyzers, Heterodyne, Application of Wave analyzers, Harmonic Analyzers, Total Harmonic distortion, spectrum analyzers, Basic spectrum analyzers, Spectral displays, Q meter and RMS voltmeters .

UNIT-VI MEASUREMENT OF NON-ELECTRICAL QUANTITIES:

Definition of transducers, Classification of transducers, Advantages of Electrical transducers, Characteristics and choice of transducers, Principle operation of Resistor, Inductor, LVDT and Capacitor transducers, LVDT Applications, Strain gauge and its principle of operation, Gauge factor- Thermistors, Thermocouples, Piezo electric transducers, Photovoltaic, Photo conductive cells. Measurement of strain, Gauge Sensitivity, Displacement, Velocity, Acceleration, Force, Torque, Measurement of Temperature.

TEXT BOOKS:

1. Electrical Measurements and measuring Instruments – E.W. Golding and F.C. Widdis, 5th Edition, Wheeler Publishing.
2. Transducers and Instrumentation– D.V.S Murthy, Prentice Hall of India, 2nd Edition.
3. A course in Electrical and Electronic Measurements and Instrumentation -A.K. Sawhney, Dhanpatrai & Co. 18th Edition.

REFERENCE BOOKS:

1. Measurements Systems, Applications and Design – D O Doebelin- Tata MC Graw-Hill.
2. Principles of Measurement and Instrumentation – A.S Morris, Pearson /Prentice Hall of India.
3. Electronic Instrumentation- H.S.Kalsi Tata MC Graw – Hill Edition, 3rd Edition.
4. Modern Electronic Instrumentation and Measurement techniques – A.D Helfrick and W.D.Cooper, Pearson/Prentice Hall of India.

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(CODE: 3HC5 1) **III year B.Tech – II Sem**
BASIC SPANISH LANGUAGE
(OPEN ELECTIVE-II)

- Unit-I** **Functional Aspects**
 Greetings, introductions, identifying others; tools to ask meaning, pronunciation and spellings; different nationalities and their languages; Hispanic names, family relations and professions; days of the week, Months.
Grammatical Aspects
 Basic structure of spelling and pronunciation; present indicative of the regular verbs ('ar/er/ir) and 'querer'; subject pronouns; interrogative sentences with 'Por que', and 'quien'; causal phrase with 'porque'; 'ser' and 'estar'; negative sentences; adjectives of nationality.
- Unit-II** **Functional Aspects**
 Ordinal and cardinal numbers: quantities; to go shopping, identifying Material, color, size etc; to go to a restaurant, food habits of Spanish and Latin American people.
Grammatical Aspects
 Gender and number of nouns and adjectives; the verb 'tener'; interrogative Sentences; demonstrative and qualitative adjectives.
- Unit-III** **Functional Aspects**
 To express opinions on something contradict someone in modest ways;
 Suggest something, to value things aesthetically and intellectually; Expression of likes and dislikes; expression and reaction to certain things, (agreement or disagreement)
Grammatical Aspects
 Qualitative adjectives, forms and usage, gradations, superlative adjectives, Exclamatory sentences; the verb 'gustar', forms and syntax; personal Pronouns; definite and indefinite pronouns, direct object pronouns Prepositions; verbs like 'parecer' and 'encontrar and preferir, their form And syntax, interrogative pronouns.
- Unit-IV** **Functional Aspects**
 Invitations; accepting and rejecting invitations; how to fix an appointment; Inviting through e-mail or telephone
Grammatical Aspects
 Present indicative of irregular verbs, expressions with 'tener' and estar Prepositional pronouns; interrogative sentences

- Unit-V **Functional Aspects**
Expression of time; Spanish and Latin American time tables and
Comparison with Indian time tables, festivals Indian and Hispanic
Grammatical Aspects
Time with ‘ser’, expressions relating to festivals.
- Unit-VI **Functional Aspects**
Expressions relating to climate, weather of the day seasons, vacations,
 planning of holiday and brochures, hotel reservations, offers
Grammatical Aspects
Expressions with verbs, ‘ser’ and ‘hacer’ and other verbs.

TEXT BOOK:

1. NOUVEAU ELE INICIAL 1

REFERENCE BOOKS:

1. Espanol sin Fronteras, A. Sanchez, M. Rios, J.A. Metella, SGEL. Madrid, 1997
2. Entre Nosotros A. Sanchez, M. Rios, J.A. Metella, SGEL. Madrid, 1997

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III year B.Tech – II Sem

(CODE: 3ZC03) BANKING OPERATIONS, INSURANCE AND RISK MANAGEMENT (OPEN ELECTIVE-II)

Course Objective: The objective of the course is to provide to students an understanding of Banking Operations, Insurance Market, and Risk Management Principles and techniques to control the risk & the major Institutions involved and the Services offered within this framework.

UNIT I

INTRODUCTION TO BANKING BUSINESS: Introduction to Banking sectors-History of banking business in India, Structure of Indian banking system: Types of accounts, advances and deposits in a bank New Dimensions and products- E-Banking, Mobile-Banking, Net Banking, CRM, cheque system and KYC system.

UNIT II

BANKING REFORMS AND REGULATIONS: Banking regulation Act-1949, Reserve Bank of India Act-1934, Establishment of RBI, Functions and credit control system; Role of commercial banks and its functions. Banking sector reforms in India and deficiencies in Indian banking including problems accounts and Non-Performing Assets.

UNIT III

INTRODUCTION TO INSURANCE: Introduction to insurance, Need and importance of Insurance, principles of Insurance, characteristics of insurance contract, branches of insurance and types of insurance; life insurance and its products: Role of Agents and brokers.

UNIT IV:

INSURANCE BUSINESS ENVIRONMENT: Regulatory and legal frame work governing the insurance sector, history of IRDA and its functions: Business and economics of insurance, need for changing mindset and latest trends.

UNIT V

INTRODUCTION TO RISK MANAGEMENT: Introduction to Risk, meaning and types of risk in business and individual, Risk management process, methods: Risk identification and measurement, Risk management techniques; Non insurance methods

UNIT VI

FINANCIAL RISK MANAGEMENT: Introduction to Financial markets. Financial risk management techniques –Derivatives, Hedging and Portfolio management techniques: Derivatives and types of Derivatives-Futures, options and swaps: Shares, Commodity and Currency trading in India.

Books Recommended:

- Varshney, P.N., Banking Law and Practice, Sultan Chand & Sons, New Delhi.
- General Principles of Insurance Harding and Evantly
- Mark S. Dorfman: Risk Management and Insurance, Pearson, 2009.

References:

- Scott E. Harringam Gregory R. Nichanus: Risk Management & Insurance, TMH, 2009.
- Geroge E. Rejda: Principles of risk Management & Insurance, 9/e, pearson Education. 2009.
- G. Koteswar: Risk Management Insurance and Derivatives, Himalaya, 2008.
- Gulati: Principles of Insurance Management, Excel, 2009.
- James S Trieschmann, Robert E. Hoyt & David N. Sommer: Risk Mgt. & Insurance, Cengage, 2009.
- Dorfman: Introduction to Risk Management and Insurance, 8/e, Pearson, 2009.
- P.K. Gupta: Insurance and Risk Management, Himalaya, 2009.
- Vivek & P.N. Asthana: Financial Risk Management, Himalaya, 2009.
- Jyotsna Sethi & Nishwan Bhatia : Elements of Banking and Insurance, 2/e,PHI, 2012.

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III year B.Tech – II Sem
(CODE: 3HC41) BASIC FRENCH LANGUAGE
(OPEN ELECTIVE – II)

UNITÉ – I :

Professions et nationalités, vie quotidienne et loisirs, descriptions physiques et psychologiques, nombres cardinaux.

Articles définis et indéfinis, genre et nombre des noms et des adjectifs, interrogation et négation, conjugaison du présent.

UNITÉ – II

Intonation, liaison, voyelles orales et nasales.

Faire connaissance, inviter et répondre à une invitation, décrire les personnes.

UNITÉ – III

Paris, monuments et lieux publics. La vie de quatre parisiens de professions différentes.

Logement et nourriture, vêtements et couleurs, fêtes et faits divers, nombres ordinaux.

UNITÉ – IV

Articles partitifs, adjectifs démonstratifs et possessifs, prépositions et adverbes de quantité et de lieu, pronoms toniques, l'impératif, verbes pronominaux.

Intonation, semi-voyelles, liaison, consonnes sonores et sourdes.

UNITÉ – V

Exprimer l'ordre et l'obligation, demander et commander, évaluer et apprécier, féliciter et remercier.

Une région de France: la Bourgogne, vie quotidienne à la campagne.

UNITÉ – VI

Teaching passé composé through the above lessons.

Text Book:

1. Dominique, Philippe, *et al.* 1999. *Le Nouveau sans Frontières -I* (Including Exercise Book). Paris: Clé, International (Indian Edition).

Reference Books:

1. Alter Ego I & II. Published by Hachette
2. Connexion I & II. Published by Didier
3. Echo I & II. Clé International publishers
4. Latitude I & II. Published by Didier

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**III year B.Tech – II Sem
BASIC GERMAN LANGUAGE
(OPEN ELECTIVE – II)**

Unit –I

- Definite and Indefinite articles(including negation)
- Noun: Gender and Plural forms, cases (nominative, accusative, dative & genitive)

Unit –II

- Verb: Strong and Weak verbs, Verbs with separable and inseparable prefixes, modal verbs, position of verb in the main and subordinate clauses, auxiliary verbs, reflexive verbs in accusative and dative cases, imperative constructions

Unit –III

- Pronouns: personal, possessive, reflexive, interrogative and demonstrative
- Prepositions: with the accusative, dative and with both these cases

Unit –IV

- Adjective :declension with the
 - Indefinite article
 - Definite article
 - Without article
 - With the indefinite pronoun
 - Degrees of comparison (also adverbs),ordinal numbers, adjectives as nouns
- Conjunctions: subordinating and coordinating with respect to the position of the verb

Unit –V

- Pretaritim of sein and haben
- Perfect tense

Unit –VI

- Negatin: of a sentence and words therein.
- Sentence structure: general principles observed in German Language.

Text Book

1. Hermann Funk, Christina Kuhn, Oliver Bayerlein., Studio d A 1.2005 Comelsen Verlag, Berlin.

Reference Books

1. Rosa –Marie Dallapiazza, Eduard von Jan, Till Schonherr,unter Mitarbeit von Jutta Orth-Chambah
Tangram aktuell 1 –Lektion 1-4, Lektion 5 - 8
Max Hueber Verlag, Munchen. 2009
2. Jutta Muller, Thomas Storz, 2006. Laguna. Heuber Veerlag, Ismaning. Deutschland

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III year B.Tech – II Sem
(CODE: 3ZC05) GENERAL MANAGEMENT & ENTREPRENEURSHIP
(OPEN ELECTIVE-II)

Course Objective: The course is designed to impart the necessary managerial skills and tactics required for an emerging Entrepreneur for the Engineering students to enhance their career prospects and ambitions of starting a new Enterprise.

Pre-requisites: This course shall require a student to have knowledge in Managerial Economics and Financial analysis, Management Science, Operations management.

UNIT I

INTRODUCTION TO MANAGEMENT AND ENTREPRENEURSHIP: Changing Face of Management-Entrepreneurship, Modern Management with Entrepreneurial Orientation.. Meaning of Entrepreneurship. Benefits and Drawbacks of Entrepreneurship Reasons feeding the Entrepreneurial fire. Understanding Entrepreneurship as a Process. Multiple roles of Entrepreneur: Intrapreneur, Inventor, Coordinator, Manager and Controller. Psychological and behavioral aspects of First-Generation Entrepreneur. Case Studies

UNIT II

PROCESS DEVELOPMENT AND INNOVATION PROJECT MANAGEMENT: Business Process Model, Value chain for Manufacturing industries and Service Industries. Frugal Innovation. Creativity process in developing Innovation.. Types of New Products, Forecasting of New Products, Stages in the New Product Development, Prototype building and pitching Going ahead with ideas, killing the ideas through Stage Gate Models, pitching of full fledged idea. Choosing the Start-Up Team.

UNIT III

PROJECT MANAGEMENT & FEASIBILITY REPORT: Project Inception, Project Implementation, and Project control. Analyzing the project by employing capital budgeting techniques, Risk Management, tools and techniques. Methods of Appraising the Project. Industry Analysis pertaining to the Product, Competitive Analysis and Market analysis. Preparation of feasibility report, Contents of Feasibility Report. Exercise to write an effective Feasibility report. Case Studies.

UNIT IV

PROTECTION OF IDEAS AND MECHANISM: Exposure to intellectual property rights to the entrepreneur in the Indian and the World context. Registration process for Patents, Copyrights, Trademarks, Geographical indicators. Legal Framework in administration of Intellectual property rights. Meaning of Infringement, consequences of Infringement. Cases on Infringement. Case Studies.

UNIT V

VENTURE FINANCING AND ISSUES RELATED TO PRICING: Meaning of Venture Capitalist, Process of Venture Capital, Seed Funding, First Phase Funding, Second Phase Funding and Final Phase funding. Cost analysis, Preparation of standard costing, Finalizing the output, fixing the pricing based on market structure, Monopoly, oligopoly market structures and marketing pricing practices for attracting customers. Case Studies

UNIT VI

MANUFACTURING AND QUALITY MANAGEMENT: Plant Layout, Process and Product Layout, Service Factory. Introduction to Quality Circles, Quality inspection, ISO Certification, process of certification and exposure to the entrepreneurs of the need for certification. Quality certification for Manufacturing industrial. Case Studies

TEXT BOOKS:

- "Projects: Planning, Analysis, Selection, Financing, Implementation, and Review", Prasanna Chandra, TMH, New Delhi, 2012
- "Project Management", Jeffrey K. Pinto, Pearson, 2011
- Small Scale industries and Entrepreneurship Vasanth Desai "Himalya publishing 2012

REFERENCE BOOKS:

- Innovation by Design", Gerald H. (Gus) Gaynor, AMACOM {American Management Association), NYC, 2002
- Entrepreneurship Rajeev Roy , oxford ,2012
- Fundamentals of Entrepreneurship Nandan H, PHI, 2013
- Entrepreneurship Development Khanka, ,S.Chand 2012
- Robert Hisrich et al "enterpreneruship TMH 2012
- Entrepreneurship Development B.Janikairam and M Rizwana

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**(CODE: 3ZC07) FUNDAMENTALS OF DISASTER MANAGEMENT
(OPEN ELECTIVE-II)**

Course Objectives:

1. To provide students an exposure to disasters, their significance and types.
2. To ensure that students begin to understand the relationship between vulnerability, disasters, disaster prevention and risk reduction
3. To gain a preliminary understanding of approaches of Disaster Risk Reduction (DRR)
4. To enhance awareness of institutional processes in the country
5. To develop rudimentary ability to respond to their surroundings with potential disaster response in areas where they live, with due sensitivity

UNIT I

INTRODUCTION TO DISASTERS: Concepts and definitions (Disaster, Hazard, Vulnerability, Resilience, Risks) Disasters – Classification, Causes, Impacts (including social, economic, political, environmental, health, psychosocial, etc.). Differential impacts – in terms of caste, class, gender, age, location, disability.

UNIT II

GLOBAL TRENDS IN DISASTERS:

Urban disasters, pandemics, complex emergencies, Climate change Case Study on Climate Change.

UNIT III

APPROACHES TO DISASTER RISK REDUCTION: Disaster cycle – its Analysis, Phases. Culture of safety, prevention, mitigation and preparedness; Community-based DRR: Structural and nonstructural measures, roles and responsibilities of community, Panchayati Raj Institutions / Urban Local Bodies (PRIs / ULBs), district administration, states, centre, and other stakeholders; Case studies.

UNIT IV

INTER-RELATIONSHIP BETWEEN DISASTERS AND DEVELOPMENT: Factors affecting Vulnerabilities, differential impacts; Impact of Development projects such as dams, embankments, changes in land-use etc; Climate change adaptation; Relevance of indigenous knowledge, appropriate technology and local resources; Case studies.

UNIT V

DISASTER MANAGEMENT IN INDIA: Hazard and vulnerability profile of India. Components of Disaster Relief: Water, Food, Sanitation, Shelter, Health, Waste Management; Institutional arrangements (Mitigation, Response and Preparedness, DM Act and Policy, Other related policies, plans, programs and legislation); Case studies.

UNIT VI

APPLICATION OF TECHNOLOGY IN DISASTER MANAGEMENT: IT in Disaster Management – Databases – RDBMS – Management information systems – Decision support systems – GIS – Intranets and Extranets – Video Conferencing, Trigger Mechanism – Remote Sensing – Contribution of remote sensing and GIS. Case Studies and Global Initiatives.

TEXT BOOKS:

1. B. K. Khanna: “Disasters: All you wanted to know about”, New India Publishing Agency, New Delhi
2. Pradeep sanhi, Madhavi malalgoda and arya bandhu, “Disaster risk reduction in south asia “PHI
3. Amita sinval, “Understanding earthquake disasters” TMH, 2010

REFERENCE BOOKS:

1. Natural Hazards and Disaster Management: R.B. Singh, Rawat Publications
2. Remote Sensing and GIS by A.M. Chandra and S.K. Ghosh, Narosa Publishing house
3. GIS – Fundamentals, Applications and Implementations: Dr. K. Elangovan, New India publishing agency

Suggested Reading List:

1. Alexander David, Introduction in ‘Confronting Catastrophe’, Oxford University Press
2. Andharia J., Vulnerability in Disaster Discourse, JTCDM, Tata Institute of Social Sciences Working Paper no. 8, 2008
3. Blaikie, P, Cannon T, Davis I, Wisner B 1997. At Risk Natural Hazards, Peoples’ Vulnerability and Disasters, Routledge.
4. Coppola P Damon, 2007. Introduction to International Disaster Management
5. Carter, Nick 1991. Disaster Management: A Disaster Manager’s Handbook. Asian Development Bank, Manila Philippines.
6. Cuny, F. 1983. Development and Disasters, Oxford University Press. Document on World Summit on Sustainable Development 2002.
7. Govt. of India: Disaster Management Act 2005, Government of India, New Delhi.
8. Government of India, 2009. National Disaster Management Policy
9. Gupta Anil K, Sreeja S. Nair. 2011 Environmental Knowledge for Disaster Risk Management, N IDM, New Delhi
10. Indian Journal of Social Work 2002. Special Issue on Psychosocial Aspects of Disasters, Volume 63, Issue 2, April.
11. Kapur, Mu & others, 2005: Disasters in India Studies of grim reality, Rawat Publishers
12. Kapur Anu 2010: Vulnerable India: A Geographical Study of Disasters, IAS and Sage Publishers, New Delhi.
13. Pelling Mark, 2003 The Vulnerability of Cities: Natural Disaster and Social Resilience Earthscan publishers, London
14. Reducing risk of disasters in our communities, Disaster theory, Tearfund, 2006.
15. UNISDR, Natural Disasters and Sustainable Development: Understanding the links between Development, Environment and Natural Disasters, Background Paper No. 5. 2002.
16. IFRC. 2005. World Disaster Report: Focus on Information in Disaster, pp. 182-225.

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(CODE: 3ZC12) PROJECT MANAGEMENT & FINANCE
(OPEN ELECTIVE-II)

Course Objective: The course has been designed to create an awareness of the need for systematic management of projects. This application-oriented course provides the skills in project planning, financing, implementing and controlling, starting from project identification, till project termination.

UNIT I

PROJECT MANAGEMENT CONCEPTS: Concept and characteristics of a project, objectives of project management, types of projects, project organizational structure, project life cycle, qualities & functions of a project manager, challenges and problems of project management.

UNIT II

PROJECT FORMULATION: Generation and Screening of Project Ideas, Project Identification, Project Rating Preliminary, Analysis, Market, Technical, Financial, Economic and Ecological Pre-Feasibility Report, Project Estimates and Techno- Economic Feasibility Report, Detailed Project Report, Different Project Clearance procedure.

UNIT III

PROJECT IMPLEMENTATION AND CONTROL: Monitor and assess project performance, performance measurement, Methods to monitor, evaluate and control planned cost and schedule performance, quality management tools and techniques at different stages of project.

UNIT IV

PROJECT FINANCING: Source of capital, Debt-Equity Financing, Formal & Informal Agencies in Financing, Government grants and Subsidies, Seed, Angel & Venture Capital, DCF Techniques: NPV, IRR, PI and Non DCF Methods: BP, ARR for Project evaluation.

UNIT V

PROJECT RISK ASSESSMENT: Probabilistic cash flow approaches, sources, measures and perspectives of standalone risk analysis, Sensitivity Analysis, Scenario Analysis, Break-Even-Analysis, Simulation managing risk, Project selection Analysis.

UNIT VI

PROJECT CLOSEOUT AND TERMINATION: Introduction, Types of Project Termination, Natural Termination – The Closeout Process: Finishing the work, Handling over the project, Gaining acceptance for the Project, Harvesting the Benefits, Project Reviewing.

TEXT BOOKS:

1. Clifford F Gray, Erik W Larson, "Project Management-The Managerial Process", Tata McGraw-Hill Publishing Co. Ltd
2. Financial Management by I M Pandey, Vikas Publishing House

REFERENCE BOOKS:

1. Jack Meredith, Samuel J. Mantel Jr, “Project Management-A Managerial Approach”, John Wiley Sons
2. John M Nicholas “Project Management for Business and Technology” Prentice Hall of India Pvt. Ltd.
3. James P Lewis “Project Planning, Scheduling and Control Tata McGraw-Hill Publishing Co. Ltd
4. Financial Management: M Y Khan & P K Jain, Text, Problem and Cases 6/e Tata McGraw-Hill Publishing Co. Ltd
5. Project Management: Engineering, Technology and Implementation, Shtub, Bard and Globerson, PH Inc.
6. Project Management Handbook, Lock, Gower.
7. Project Management Handbook, Cleland and King, VNR
8. Project Management: Systems approach to Planning Scheduling and Controlling, H. Kerzner.
9. Project Scheduling and Monitoring in Practice, S. Choudhury, SAP.
10. Total Project Management: The Indian Context, P. K. Joy, Macmillan India Ltd.

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(CODE: 3HC77)

III Year B.Tech. II- Semester
LOGICAL REASONING
(Common to All Branches)

Unit – I

Series Completion: Number Series, Alphabet Series, Alpha – Numeric Series.

Analogy: Completing the Analogous Pair, Simple Analogy, Choosing the Analogous pair, Double Analogy, Word Analogy, and Number Analogy.

Unit – II

Classification / Odd One Out: Word Classification, Number Classification, Letter Classification.

Coding – Decoding: Letter Coding, Number Coding, Matrix Coding, Substitution, Deciphering Message Word Codes, Jumbled Coding.

Unit – III

Deciphering Jumbled up Descriptions, Relation Puzzle – Direction sense test.

Number, Ranking & Time Sequence Test – Arithmetical Reasoning – Mathematical Operations.

Unit – IV

Blood Relations, Directions, Arithmetical Reasoning.

Puzzle Test: Classification Type Questions, Seating Arrangements Comparison Type Questions, Sequential Order of Things, Selection Based on given conditions, Family – Based Puzzles, Jumbled Problems.

Unit – V

Assertions and Reason– Logical Venn Diagrams – Alpha Numeric Sequence Puzzle.

Cubes and Dice – Analytical Reasoning .Logical Deduction: Logic, Statement – Arguments,

Unit – VI

Clocks & Calendar .Data Sufficiency and Syllogism.

Text Book: Verbal and Non Verbal Reasoning by R.S.Agarwal.

(CODE: 3A676)

**B. Tech. EEE III Year II Semester
COMPREHENSIVE VIVA- II**

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There shall be a Comprehensive Viva-Voce in III year II Semester. The Comprehensive Viva-Voce will be conducted by a Committee consisting of an external examiner, Head of the Department and two Senior Faculty members of the Department. The Comprehensive Viva-Voce is aimed to assess the students' understanding in various subjects he/she studied during the B.Tech. course of study up to III Year. The Comprehensive Viva-Voce is valued for 50 marks by the Committee. There are no internal marks for the Comprehensive Viva-Voce.

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III Year B.Tech – II Sem
(CODE: 3A677) ELECTRICAL MACHINES LAB – II

The following experiments are required to be conducted as compulsory experiments:

1. O.C. & S.C. Tests on Single phase Transformer
2. Sumpner's test on a pair of single phase transformers
3. Scott connection of transformers
4. No-load & Blocked rotor tests on three phase Induction motor
5. Regulation of a three –phase alternator by synchronous impedance & m.m.f. methods
6. V and Inverted V curves of a three—phase synchronous motor.
7. Equivalent Circuit of a single phase induction motor
8. Determination of X_d and X_q of a salient pole synchronous machine

In addition to the above eight experiments, atleast any two of the following experiments are required to be conducted from the following list:

1. Parallel operation of Single phase Transformers
2. Separation of core losses of a single phase transformer
3. Brake test on three phase Induction Motor
4. Regulation of three-phase alternator by Z.P.F. and A.S.A methods
5. Efficiency of a three-phase alternator
6. Heat run test on a bank of 3 Nos. of single phase Delta connected transformers
7. Measurement of sequence impedance of a three-phase alternator.
8. Performance characteristics of a Schrage motor

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III Year B.Tech – II Sem

(CODE: 3A678)

POWER ELECTRONICS AND SIMULATION LAB

Any Eight of the Experiments in Power Electronics Lab

1. Study of Characteristics of SCR, MOSFET & IGBT
2. Gate firing circuits for SCR's
3. Single Phase AC Voltage Controller with R and RL Loads
4. Single Phase fully controlled bridge converter with R and RL loads
5. Forced Commutation circuits (Class A, Class B, Class C, Class D & Class E)
6. DC Jones chopper with R and RL Loads
7. Single Phase Parallel, inverter with R and RL loads
8. Single Phase Cycloconverter with R and RL loads
9. Single Phase Half controlled converter with R load
10. Three Phase half controlled bridge converter with R-load
11. Single Phase series inverter with R and RL loads
12. Single Phase Bridge converter with R and RL loads
13. Single Phase dual converter with RL loads

Any two simulation experiments with PSPICE/PSIM

PSPICE simulation of single-phase full converter using RLE loads and single-phase AC voltage controller using RLE loads.

PSPICE simulation of resonant pulse commutation circuit and Buck chopper.

PSPICE simulation of single phase Inverter with PWM control.

REFERENCE BOOKS:

1. Simulation of Electric and Electronic circuits using PSPICE – by M.H.Rashid, M/s PHI Publications.
2. PSPICE A/D user's manual – Microsim, USA.
3. PSPICE reference guide – Microsim, USA.
4. MATLAB and its Tool Books user's manual and – Mathworks, USA.

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**IV Year B.Tech – I Sem
POWER STATION PRACTICE**

OBJECTIVE:

Electrical Power plays significant role in day to day life of entire mankind. This course concerns the generation and distribution of power along with the economic aspects.

UNIT -1 HYDROELECTRIC POWER STATION:

Elements of hydro electric power station, Types, Concept of pumped storage plants, Storage requirements, Mass curve(explanation only) Estimation of power developed from a given catchments area, Heads and efficiencies

Thermal power stations:

Line diagram of Thermal Power Station (TPS) showing paths of coal, Steam, Water, Air, ash and flue gasses, Brief description of TPS components, Economizers, Boilers, Super heaters, Turbines, Condensers, Chimney and Cooling towers.

UNIT -II GAS AND NUCLEAR POWER STATIONS:

Nuclear Fission and Chain reaction, Nuclear fuels, Principle of operation of Nuclear reactor, Reactor Components, Moderators, Control rods, Reflectors and Coolants, Radiation hazards, Shielding and Safety precautions, Types of Nuclear reactors and brief description of PWR, BWR and FBR.
Gas Power Stations, Principle of Operation and Components (Block Diagram Approach Only).

UNIT - III SUBSTATIONS:

Classification of Substations, Air insulated substations, Indoor & Outdoor substations, Substations layout showing the location of all the substation equipment. Bus bar arrangements in the sub-stations, Simple arrangements like single bus bar, sectionalized single bus bar, Main and transfer bus bar system with relevant diagrams.

Gas insulated substations (GIS): Advantages of Gas insulated substations, Different types of gas insulated substations, Single line diagram of gas insulated substations, Bus bar, Construction aspects of GIS, Installation and maintenance of GIS, Comparison of Air insulated substations and Gas insulated substations.

UNIT-IV POWER FACTOR AND VOLTAGE CONTROL:

Causes of low p.f, Methods of Improving p.f, Phase advancing and generation of reactive KVAR using static Capacitors, Most economical p.f. for constant KW load and constant KVA type loads, Numerical Problems.

Dependency of Voltage on Reactive Power flow, Methods of Voltage Control, Shunt Capacitors, Series Capacitors, Synchronous Capacitors, Tap changing and Booster Transformers

UNIT-V ECONOMIC ASPECTS OF POWER GENERATION AND TARIFF METHODS:

Load curve, Load duration and integrated load duration curves, Load, Demand, Diversity, Capacity, Utilization and plant use factors, Numerical Problems.

Costs of Generation and their division into Fixed, Semi - fixed and Running Costs.

Desirable Characteristics of a Tariff Method, Tariff Methods, Flat Rate, Block-Rate, Two-part, Three -part and power factor tariff methods and Numerical Problems.

UNIT-VI ECONOMIC OPERATION OF POWER SYSTEMS:

Optimal operation of Generators in Thermal Power Stations, Heat rate Curve, Cost Curve, Incremental fuel and Production costs, Input-output characteristics, Optimum generation allocation with line losses neglected. Optimum generation allocation including the effect of transmission line losses, Loss Coefficients, General transmission line loss formula. Hydrothermal scheduling.

TEXT BOOKS

1. A Text Book on Power System Engineering - M.L.Soni, P.V.Gupta, U.S.Bhatnagar and A.Chakraborti, Dhanpat Rai & Co. Pvt. Ltd.
2. Principles of Power Systems - V.K Mehta and Rohit Mehta S.CHAND& COMPANY LTD., New Delhi.

REFERENCE BOOKS

1. Elements of Power Station design and practice - M.V. Deshpande, Wheeler Publishing.
2. Electrical Power Systems - C.L.Wadhawa New Age International (P) Limited, Publishers.
3. Electrical Power Generation, Transmission and Distribution - S.N.Singh., PHI.
4. Gas turbine performance - PP Wals, P.Fletcher, Blackwell Publisher.

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IV Year B.Tech – I Sem**(CODE: 3A715)****NON-CONVENTIONAL ENERGY SOURCES****OBJECTIVE:**

It introduces solar energy its radiation, Collection, storage and application. It also introduces the Wind energy, Biomass energy, geothermal energy and ocean energy as alternative energy sources.

UNIT – I -PRINCIPLES OF SOLAR RADIATION:

Role and potential of new and renewable source, The solar energy option, Environmental impact of solar power, Physics of the sun, the solar constant, Extraterrestrial and terrestrial solar radiation, Solar radiation on titled surface, Instruments for measuring solar radiation and sun shine, Solar radiation data.

UNIT-II- SOLAR ENERGY COLLECTION STORAGE AND APPLICATIONS: Flat plate and concentrating collectors, Classification of concentrating collectors, orientation and thermal analysis, Advanced collectors.

Different methods, Sensible, Latent heat and stratified storage, Solar ponds. Solar Applications- solar heating/cooling technique, Solar distillation and drying, Photovoltaic energy conversion.

UNIT – III WIND ENERGY:

Sources and potentials, Horizontal and vertical axis windmills, Performance characteristics, Betz criteria

BIO-MASS: Principles of Bio-Conversion, Anaerobic/aerobic digestion, Types of Bio-gas digesters, Gas yield, Combustion characteristics of bio-gas, Utilization for cooking, I.C.Engine operation and economic aspects.

UNIT – IV GEOTHERMAL ENERGY:

Resources, types of wells, methods of harnessing the energy, Potential in India.

UNIT-V OCEAN ENERGY:

OTEC, Principles utilization, Setting of OTEC plants, Thermodynamic cycles. Tidal and wave energy, Potential and conversion techniques, Mini-hydel power plants and their economics.

UNIT-VI DIRECT ENERGY CONVERSION:

Need for DEC, Carnot cycle, Limitations, principles of DEC. Thermoelectric generators, seebeck, Peltier and joul Thomson effects, Figure of merit, materials, Applications, MHD generators, Principles, Dissociation and ionization, Hall effect, Magnetic flux, MHD accelerator, MHD Engine, Power generation systems, Electron gas dynamic conversion, economic aspects. Fuel cells – principles - Faraday's law's - Thermodynamic aspects - selection of fuels and operating conditions.

TEXT BOOKS:

1. Non-Conventional Energy Sources - G.D. Rai
2. Renewable Energy Technologies - Ramesh & Kumar /Narosa.

REFERENCE BOOKS:

1. Renewable energy resources - Tiwari and Ghosal/ Narosa.
2. Non-Conventional Energy - Ashok V Desai /Wiley Eastern.
3. Non-Conventional Energy Systems - K Mittal /Wheeler
4. Solar Energy - Sukhame

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IV Year B.Tech – I Sem

(CODE: 3A713)

POWER SEMICONDUCTOR DRIVES**Objective:**

This course is an extension of Power Electronics applications to AC and DC drives. Control of DC motor drives with single phase and three phase converters and choppers are given in detail. The control of AC motor drives with variable frequency converters and variable voltage are presented.

UNIT – I CONTROL OF DC MOTORS BY SINGLE PHASE AND THREE PHASE CONVERTERS:

Introduction to Thyristor controlled Drives, Single Phase and three phase semi and Fully controlled converters connected to d.c separately excited and d.c series motors, Continuous current operation, Output voltage and current waveforms, Speed and Torque expressions, Speed, Torque Characteristics, Problems on Converter fed d.c motors.

UNIT – II FOUR QUADRANT OPERATION OF DC DRIVES:

Introduction to Four quadrant operation, Motoring operations, Electric Braking, Plugging, Dynamic and Regenerative Braking operations. Four quadrant operation of D.C motors by dual converters, Closed loop operation of DC motor (Block Diagram Only).

UNIT-III CONTROL OF DC MOTORS BY CHOPPERS:

Single quadrant, Two - quadrant and four quadrant chopper fed dc separately excited and series excited motors, Continuous current operation, Output voltage and current wave forms, Speed torque expressions, speed torque characteristics, Problems on Chopper fed D.C Motors, Closed Loop operation (Block Diagram Only).

UNIT – IV CONTROL OF INDUCTION MOTOR ON STATOR SIDE:

Variable voltage characteristics, Control of Induction Motor by AC Voltage Controllers, Waveforms, speed torque characteristics, Variable frequency characteristics, Variable frequency control of induction motor by Voltage source and current source inverter and cyclo converters, PWM control, Comparison of VSI and CSI operations, Speed torque characteristics, numerical problems on induction motor drives, Closed loop operation of induction motor drives (Block Diagram Only).

UNIT –V CONTROL OF INDUCTION MOTOR ON ROTOR SIDE:

Static rotor resistance control, Slip power recovery, Static Scherbius drive, Static Kramer Drive, Their performance and speed torque characteristics, Advantages applications, problems.

UNIT – VI CONTROL OF SYNCHRONOUS MOTORS:

Separate control & self control of synchronous motors, Operation of self controlled synchronous motors by VSI and CSI cyclo converters. Load commutated CSI fed Synchronous Motor, Operation, Waveforms, Speed torque characteristics, Applications Advantages and Numerical Problems, Closed Loop control operation of synchronous motor drives (Block Diagram Only), Variable frequency control, Cyclo converter, PWM, VFI, CSI.

TEXT BOOKS:

1. Fundamentals of Electric Drives – G K Dubey, Narosa Publications
2. Power Electronic Circuits, Devices and applications – M.H.Rashid, PHI.

REFERENCE BOOKS:

1. Power Electronics – MD Singh and K B Khanchandani, Tata – McGraw-Hill Publishing Company.
2. Modern Power Electronics and AC Drives – B.K.Bose, PHI.
3. Thyristor Control of Electric drives – Vedam Subramanyam Tata McGraw Hill Publications.
4. A First course on Electrical Drives – S K Pillai New Age International (P) Ltd, 2nd Edition.

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(CODE: 3A716)

IV Year B.Tech – I Sem
UTILIZATION OF ELECTRICAL ENERGY
(PROFESSIONAL ELECTIVE-I)

OBJECTIVE:

This subject deals with the fundamentals of illumination and its classification and the electric heating and welding. It gives the detailed study of all varieties of Electric drives and their applications to electrical engineering.

UNIT – I DRIVE APPLICATIONS:

Type of electric drives, Choice of motor, starting and running characteristics, Speed control, Temperature rise, Particular applications of electric drives, Types of industrial loads, Continuous, Intermittent and variable loads, Load equalization.

UNIT – II ELECTRIC HEATING:

Advantages and methods of electric heating, Resistance heating induction heating and dielectric heating.

Electric welding:

Electric welding, resistance and arc welding, electric welding equipment, comparison between A.C. and D.C. Welding.

UNIT – III ILLUMINATION FUNDAMENTALS:

Introduction, terms used in illumination, laws of illumination, polar curves, photometry, integrating sphere, sources of light.

UNIT – IV VARIOUS ILLUMINATION METHODS

Discharge lamps, MV and SV lamps – comparison between tungsten filament lamps and fluorescent tubes, Basic principles of light control, Types and design of lighting and flood lighting.

UNIT – V ELECTRIC TRACTION - I :

System of electric traction and track electrification. Review of existing electric traction systems in India. Special features of traction motor, methods of electric braking-plugging rheostatic braking and regenerative braking. Mechanics of train movement. Speed-time curves for different services – trapezoidal and quadrilateral speed time curves.

UNIT – VI ELECTRIC TRACTION - II :

Calculations of tractive effort, power, specific energy consumption for given run, effect of varying acceleration and braking retardation, adhesive weight and coefficient of adhesion.

TEXT BOOKS:

1. Utilization of Electric Power & Electric Traction - J.B. Gupta, S.K.Kataria & Sons, 9th edition.
2. Utilization of Electric Energy - E.Open Shaw Taylor Orient Longman, 2nd edition.
3. Art & Science of Utilization of electrical Energy - Partab, Dhanpat Rai & Sons, 2nd edition.

REFERENCE BOOKS:

1. Utilization of Electrical Power including Electric drives and Electric traction - N.V.Suryanarayana, New Age International (P) Limited, 1st edition.
2. Generation, Distribution and Utilization of electrical Energy - C.L. Wadhwa, New Age International (P) Limited, 1st revised edition.

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IV Year B.Tech – I Sem
(CODE: 3A717) **HIGH VOLTAGE ENGINEERING**
(PROFESSIONAL ELECTIVE-I)

OBJECTIVE;

This subject deals with the detailed analysis of Breakdown occur in gaseous, Liquids and solid dielectrics. Information about generation and measurement of High voltage and current. In addition the High voltage testing methods are also discussed.

UNIT - I INTRODUCTION TO HIGH VOLTAGE TECHNOLOGY AND APPLICATIONS:

Electric Field Stresses, Gas / Vacuum as Insulator, Liquid Dielectrics, Solids and Composites, Estimation and Control of Electric Stress, Numerical methods for electric field computation, Surge voltages, their distribution and control, Applications of insulating materials in transformers, Rotating machines, Circuit breakers, Cable power capacitors and bushings.

UNIT – II BREAK DOWN IN GASEOUS, LIQUID AND SOLID DIELECTRICS:

Gases as insulating media, Collision process, Ionization process, Townsend's criteria of breakdown in gases, Paschen's law. Liquid as Insulator, Pure and commercial liquids, Breakdown in pure and commercial liquids.

Intrinsic breakdown, electromechanical breakdown, Thermal breakdown, Breakdown of solid dielectrics in practice, Breakdown in composite dielectrics, Solid dielectrics used in practice.

UNIT – III GENERATION AND MEASUREMENT OF HIGH VOLTAGES AND CURRENTS:

Generation of High Direct Current Voltages, Generation of High alternating voltages, Generation of Impulse Voltages, Generation of Impulse currents, Tripping and control of impulse generators.

Measurement of High Direct Current voltages, Measurement of High Voltages Alternating and impulse, Measurement of High Currents-direct, Alternating and Impulse, Oscilloscope for impulse voltage and current measurements.

UNIT – IV OVER VOLTAGE PHENOMENON AND INSULATION CO-ORDINATION:

Natural causes for over voltages, Lightning phenomenon, Over voltage due to switching surges, system faults and other abnormal conditions, Principles of Insulation Coordination on High voltage and Extra High Voltage power systems.

UNIT – V NON-DSTRUCTIVE TESTING OF MATERIAL AND ELECTRICAL APPARATUS:

Measurement of D.C Resistively, Measurement of Dielectric Constant and loss factor, Partial discharge measurements.

UNIT – VI HIGH VOLTAGE TESTING OF ELECTRICAL APPARATUS:

Testing of Insulators and bushings, Testing of Isolators and circuit breakers, Testing of cables, Testing of Transformers, Testing of Surge Arresters, Radio Interference measurements.

TEXT BOOKS:

1. High Voltage Engineering – M.S.Naidu and V. Kamaraju, TMH Publications, 3rd Edition.
2. High Voltage Engineering Fundamentals – E.Kuffel, W.S.Zaengl, J.Kuffel by Elsevier, 2nd Edition.

REFERENCE BOOKS:

1. High Voltage Engineering – C.L.Wadhwa, New Age Internationals (P) Limited.
2. High Voltage Insulation Engineering – Ravindra Arora, Wolfgang Mosch, New Age International (P) Limited.

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IV Year B.Tech – I Sem
DIGITAL SIGNAL PROCESSING
(PROFESSIONAL ELECTIVE-I)

After studying this course, the students will be able to

1. Distinguish between CT and DT signals and systems and understand the growing need of DSP and study the concepts of discrete time signals and systems..
2. Represent periodic DT signals as a Fourier series; non-periodic DT signals as a Fourier Transform and use a powerful mathematical tool called DFT.
3. Compute the Fourier Transform of DT signals using the FFT algorithms.
4. Realize a digital filter in several forms and structures for a given transfer function $H(z)$.
5. Distinguish IIR and FIR filters; Design each type by several methods once the desired specifications are given.
6. Understand the need and implement the multirate sampling techniques.

UNIT I

INTRODUCTION: Introduction to Digital Signal Processing: Discrete time signals & sequences, 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: Properties of discrete Fourier series, DFS representation of periodic sequences, Discrete Fourier transforms: Properties of DFT, linear convolution of sequences using DFT, Computation of DFT. Relation between Z-transform and DFS

UNIT III

FAST FOURIER TRANSFORMS: Fast Fourier transforms (FFT) - Radix-2 decimation in time and decimation in frequency FFT Algorithms, Inverse FFT.

UNIT IV

REALIZATION OF DIGITAL FILTERS: Review of Z-transforms, Applications of Z – transforms, solution of difference equations of digital filters, Block diagram representation of linear constant-coefficient difference equations, Basic structures of IIR systems, Transposed forms, Basic structures of FIR systems, System function.

UNIT V

IIR DIGITAL FILTERS: Analog filter approximations – Butter worth and Chebyshev, Design of IIR Digital filters from analog filters, Design Examples: Analog-Digital transformations
FIR DIGITAL FILTERS: Characteristics of FIR Digital Filters, frequency response. Design of FIR Digital Filters using Window Techniques, Frequency Sampling technique, Comparison of IIR & FIR filters.

UNIT VI

MULTIRATE DIGITAL SIGNAL PROCESSING: Decimation, interpolation, sampling rate conversion, Implementation of sampling rate conversion. Applications of Multirate signal processing. Introduction to DSP Processors

TEXT BOOKS:

1. Digital Signal Processing – Alan V. Oppenheim, Ronald W. Schaffer, PHI Ed., 2006
2. Digital Signal Processing, Principles, Algorithms, and Applications: John G. Proakis, Dimitris G. Manolakis, Pearson Education / PHI, 2007.

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IV Year B.Tech – I Sem
ELECTRICAL MACHINE DESIGN
(PROFESSIONAL ELECTIVE-I)

OBJECTIVE:

To provide sound knowledge about constructional details and design of various electrical machines. To study mmf calculation and thermal rating of various types of electrical machines. To design armature and field systems for D.C. machines. To design core, yoke, windings and cooling systems of transformers. To design stator and rotor of induction machines. To design stator and rotor of synchronous machines and study their thermal behaviour.

UNIT - I INTRODUCTION:

Major considerations in Electrical Machine Design - Electrical Engineering Materials – Space factor – Choice of Specific Electrical and Magnetic loadings – Thermal considerations - Heat flow – Temperature rise - Rating of machines – Standard specifications.

UNIT -II DC MACHINES:

Output Equations – Main Dimensions - Magnetic circuit calculations – Carter’s Coefficient - Net length of Iron –Real & Apparent flux densities – Selection of number of poles – Design of Armature – Design of commutator and brushes – performance prediction using design values.

UNIT III TRANSFORMERS:

Output Equations – Main Dimensions - KVA output for single and three phase transformers – Window space factor – Overall dimensions – Operating characteristics – Regulation – No load current – Temperature rise in Transformers – Design of Tank - Methods of cooling of Transformers.

UNIT IV INDUCTION MOTORS:

Output equation of Induction motor – Main dimensions – Length of air gap- Rules for selecting rotor slots of squirrel cage machines – Design of rotor bars & slots – Design of end rings – Design of wound rotor -- Magnetic leakage calculations – Leakage reactance of polyphase machines- Magnetizing current - Short circuit current – Circle diagram - Operating characteristics.

UNIT V SYNCHRONOUS MACHINES-I:

Output equations – choice of loadings – Design of salient pole machines – Short circuit ratio – shape of pole face – Armature design – Armature parameters – Estimation of air gap length.

UNIT VI SYNCHRONOUS MACHINES-II:

Design of rotor – Design of damper winding – Determination of full load field mmf – Design of field winding – Design of turbo alternators – Rotor design.

TEXT BOOKS:

1. Sawhney, A.K., 'A Course in Electrical Machine Design', Dhanpat Rai & Sons, New Delhi, 1984.
2. Sen, S.K., 'Principles of Electrical Machine Designs with Computer Programmes', Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi, 1987.

REFERENCE BOOKS:

1. A.Shanmugasundaram, G.Gangadharan, R.Palani 'Electrical Machine Design Data Book', New Age International Pvt. Ltd., Reprint 2007.
2. 'Electrical Machine Design', Balbir Singh, Brite Publications, Pune.

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IV Year B.Tech – I Sem
(CODE : 3GC06) ENVIRONMENTAL STUDIES
(Common to all branches)

UNIT I: ECOSYSTEMS

Ecosystem definition, concept, Structure and Function, food chain and food web, Ecological pyramids, Biogeochemical cycles, Ecological niche and succession, Classification (Forest, Grassland, Desert, Pond, River, Marine, Estuarine, Wetlands), ecosystem value, services and carrying capacity.

UNIT II: NATURAL RESOURCES

Definition, classification, Forest resources-use and over-exploitation, deforestation, Forest Conservation Act, Energy resources-energy demand, renewable and non-renewable energy resources, alternate energy resources, Case studies. Food Resources-World Food problems, effects of modern agriculture, fertilizer-pesticide problems, Mineral resources : Use and exploitation environmental effects of extracting and using mineral resources, case studies.

UNIT III: ENVIRONMENTAL COMPONENTS

Atmosphere- Definition, layers, state (weather and climate) acid rain, green house effect, ozone layer depletion, Seasons in India, Global warming, Kyoto protocol, Montreal protocol, Carbon trading, Hydrosphere-Definition, Types (surface and groundwater), distribution, Water conservation, use and over-exploitation, floods, drought, dams-benefits and problems, conflicts over water, Lithosphere- Chemical composition of the earth (core, mantle, crust), mineral resources-environmental effects of mining, Rocks and soils, Plate tectonics

UNIT IV: BIO DIVERSITY AND ITS CONSERVATION

Introduction, Definition, Genetic species and Eco system diversity, Value of bio diversity, Hot spots, Threats to bio diversity, Conservation strategies: Insitu and Exsitu conservation, Biological Diversity Act 2002, Wild life Protection Act.

UNIT V: ENVIRONMENTAL POLLUTION AND CONTROL

Air pollution: Definition, causes, effects and Control measures, Environment Protection Act, Air (Prevention and Control of Pollution) Act, 1981, Case study: Bhopal Gas Tragedy, London smog, Chernobyl disaster, Water Pollution- Definition, types, characteristics of domestic and industrial effluents – Water quality parameters, Drinking water treatment and standards, Waste water treatment, Case studies: Ganga Water Pollution, Mercury pollution-Minamata Bay diseases, Water (Prevention and Control of Pollution) Act, 1974, Definition, causes, effects and Control measures: Soil Pollution, Noise Pollution and Marine Pollution, Waste Management- Solid Waste, Hazardous waste and E-waste management, Disaster Management-Floods, Earthquakes and Cyclones.

UNIT VI: SUSTAINABLE DEVELOPMENT

Concept of Sustainable development, Threats to sustainability-population explosion, urbanization, over-exploitation of resources, Strategies for Sustainable development- Wasteland reclamation, Role of IT (Remote sensing and GIS) in environmental management, green technologies, Environmental Impact Assessment-overview

TEXT BOOKS:

1. INTRODUCTION TO ENVIRONMENTAL SCIENCE –by Dr.Y.Anjaneyulu, B.S.Publications 2004.
2. ENVIRONMENTAL STUDIES by Erach bharucha 2005, University grants commission, University press.

3. ENVIRONMENTAL SCIENCES-A NEW APPROACH by Purohit, shammi and Agarwal, Agrobios (India) 2004.
4. ENVIRONMENTAL SCIENCES-A Text book for Undergraduate by Dr. K.Mukkanti, S. Chand & Company Ltd., 2010.

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(CODE: 3A779)

B. Tech. IV Year I Semester
PROJECT PHASE - I

A project phase - I seminar in fourth year first semester will be evaluated for 50 marks as follows. This is aimed at the students to identify a project on which they are likely to continue for their project in the fourth year second semester.

Preliminary report on progress of work	10 marks
Mid semester presentation	10 marks
Final report	10 marks
Final presentation and defense before a departmental committee consisting of Head, a senior faculty and supervisor	20 marks

There shall be no external evaluation in project phase – I.

B. Tech. IV Year I Semester

(CODE: 3A780)

INDUSTRY ORIENTED MINI PROJECT

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There shall be an industry-oriented mini-Project in their specialization that may be carried out in collaboration with an industry / R & B organization / Academic Institution, to be taken up during the vacation after III year II Semester examination. However, the mini project and its report shall be evaluated during IV year I Semester. The industry oriented mini project shall be evaluated for a total of 75 marks with 25 marks for internal assessment and 50 marks for end examination. The mini project must be submitted in report form and should be presented before a committee, consisting of an external examiner, head of the department, a senior faculty member of the department and supervisor of the mini project.

The pattern of internal evaluation is as follows:

Work in progress as evaluated by internal guide	:	05 marks
Work in progress as evaluated by External guide	:	10 marks
Report	:	05 marks
Seminar presentation and defense of project	:	05 marks

If the mini project is conducted within the college, the work in progress is evaluated by the supervisor for 15 marks.

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**(CODE: 3A781) IV Year B.Tech – I Sem
 ELECTRICAL WORKSHOP**

1. Core assembly for a choke coil
2. Choke construction –insulation, winding and testing
3. Core assembly for single phase transformer
4. Insulation and winding
5. Testing
6. Motor testing single phase motor
7. Motor testing three phase motor
8. D.C. machine trainer kit
9. Fan-testing and assembling
10. Cable jointing
11. D.O.L starter –forward and reverse
12. Y-Δ starter forward and reverse

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IV Year B.Tech – I Sem
(CODE:3DC71) MICROPROCESSORS AND MICROCONTROLLERS LAB
 (Common to ECM, ECE & EEE)

Cycle - I

Introduction to MASM/TASM, KIEL IDE, Familiarization with 8086, 8051 Kits

8086 ALP using kit and MASM

1. Basic arithmetic and logical operations
2. Code conversion decimal arithmetic programs
3. String manipulation programs
4. Display a message on the screen of a computer using DOS / BIOS interrupts.

Cycle – II

Following peripherals and interfacing experiments to be implemented on 8086 and 8051 kits

1. A/D and D/A interfacing
2. Serial interfacing with PC
3. Keyboard and display interfacing
4. Stepper motor controller
5. Traffic light controller
6. Real Time clock interface with 8051 using 1²C

IV Year B.Tech – I Sem
MEASUREMENTS AND INSTRUMENTATION LAB

Code: 3A782

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The following experiments are required to be conducted as compulsory experiments:

1. Calibration and Testing of single phase energy Meter
2. Calibration of dynamometer power factor meter
3. Crompton D.C. Potentiometer – Calibration of PMMC ammeter and PMMC voltmeter
4. Kelvin's double Bridge – Measurement of resistance – Determination of Tolerance.
5. Measurement of % ratio error and phase angle of given C.T. by comparison.
6. Schering bridge & Anderson bridge.
7. Measurement of 3 phase reactive power with single-phase wattmeter.
8. Measurement of parameters of a choke coil using 3 voltmeter and 3 ammeter methods.

In addition to the above eight experiments, atleast any two of the experiments from the following list are required to be conducted:

9. Optical bench – Determination of polar curve measurement of MHCP of filament lamps
10. Calibration LPF wattmeter – by Phantom testing
11. Measurement of 3 phase power with single watt meter and 2 No's of C.T.
12. C.T. testing using mutual Inductor – Measurement of % ratio error and phase angle of given C.T. by Null method.
13. P.T. testing by comparison – V.G. as Null detector – Measurement of % ratio error and phase angle of the given P.T.
14. Dielectric oil testing using H.T. testing Kit
15. LVDT and capacitance pickup – characteristics and Calibration
16. Resistance strain gauge – strain measurements and Calibration
17. Polar curve using Lux meter, Measurement of intensity of illumination of fluorescent lamp.
18. Transformer turns ratio measurement using A.c. Bridge.
19. Relay testing using secondary current injection set for over current & reverse current.
20. A.C. Potentiometer – Polar form/Cartesian form – Calibration of AC Voltmeter, Parameters of Choke.
21. Measurement of Iron loss in a bar specimen using a CRO and using a wattmeter.

Code: 3A787

IV Year B.Tech – I Sem
 TECHNICAL PAPER WRITING AND SEMINAR - III

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There shall be a technical seminar evaluated for 25 marks in fourth year second semester. The evaluation is purely internal and will be conducted as follows:

- Preliminary Report on progress of the work and viva 05 marks
- Final report 05 marks
- Presentation and Defence before a departmental committee
 Consisting of Head, a senior faculty and supervisor 15 marks

**IV Year B.Tech – II Sem
ELECTRICAL DISTRIBUTION SYSTEM**

(CODE: 3A820)

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UNIT – 1 GENERAL CONCEPT

Introduction to distribution systems, Load modelling and characteristics. Coincidence factor, contribution factor loss factor - Relationship between the load factor and loss factor. Classification of loads (Residential, Commercial, Agricultural and Industrial) and their characteristics.

UNIT – II DISTRIBUTION FEEDERS

Design Considerations of Distribution Feeders: Radial and loop types of primary feeders, Voltage levels, Feeder loading; Basic design practice of the secondary distribution system.

UNIT – III SUBSTATIONS

Location of Substations: Rating of distribution substation, Service area within primary feeders. Benefits derived through optimal location of substations.

UNIT – IV SYSTEM ANALYSIS Voltage drop and power-loss calculations: Derivation for voltage drop and power loss in lines, Manual methods of solution for radial networks, Three phase balanced primary lines.

UNIT – V PROTECTION & CO-ORDINATION

Objectives of distribution system protection, Types of common faults and procedure for fault calculations. Protective Devices: Principle of operation of Fuses, Circuit Reclosures, line sectionalizes and circuit breakers.

Coordination of Protective Devices: General coordination procedure.

UNIT – VI POWER FACTOR IMPROVEMENT & VOLTAGE CONTROL

Capacitive compensation for power-factor control. Different types of power capacitors, Shunt and series capacitors, Effect of shunt capacitors (Fixed and switched), Power factor correction, capacitor allocation - Economic justification - Procedure to determine the best capacitor location.

Voltage Control: Equipment for voltage control, Effect of series capacitors, Effect of AVB / AVR, line drop compensation.

TEXT BOOK:

1. “Electric Power Distribution system, Engineering” – Turan Gonen, Mc Graw-hill 2nd edition.
2. Electric Power Distribution – A.S. Pabra, Tata Mc Graw-hill, 4th edition.

REFERENCE BOOK:

1. Electrical Power Distribution and Automation – S.Sivanagaraju, V.Sankar, Dhanpat Rai publishers. Rai & Co, 1st edition.
2. Electrical Power Distribution Systems – V.Kamaraju, Right Publishers, 2nd edition.

IV Year B.Tech – II Sem

(CODE: 3A818)

OPTIMIZATION TECHNIQUES
(PROFESSIONAL ELECTIVE-II)

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UNIT – I INTRODUCTION AND CLASSICAL OPTIMIZATION TECHNIQUES:

Statement of an Optimization problem – design vector – design constraints – constraint surface-objective function – objective function surfaces – classification of Optimization problems.

UNIT – II CLASSICAL OPTIMIZATION TECHNIQUES:

Single variable Optimization – multi variable Optimization without constraints – necessary and sufficient conditions for minimum/maximum – multivariable Optimization with equality constraints. Solution by method of Lagrange multipliers – multivariable Optimization with inequality constraints – Kuhn – Tucker conditions.

LINEAR PROGRAMMING

Standard form of a linear programming problem – geometry of linear programming problems – definitions and theorems – solution of a system of linear simultaneous equations – pivotal reduction of a general system of equations – motivation to the simplex method – simplex algorithm.

UNIT – III TRANSPORTATION PROBLEM

Finding initial basic feasible solution by north – west corner rule, least cost method and Vogel’s approximation method – testing for optimality of balanced transportation problems.

UNIT – IV UNCONSTRAINED NONLINEAR PROGRAMMING:

One – dimensional minimization methods: Classification, Fibonacci method and Quadratic interpolation method

Unconstrained Optimization Techniques Univariate method, Powell’s method and steepest descent method.

UNIT – V CONSTRAINED NONLINEAR PROGRAMMING:

Characteristics of a constrained problem, Classification, Basic approach of Penalty Function method; Basic approaches of Interior and Exterior penalty function methods. Introduction to convex Programming Problem.

UNIT – VI DYNAMIC PROGRAMMING:

Dynamic programming multistage decision processes – types – concept of sub optimization and the principle of optimality – computational procedure in dynamic programming – examples illustrating the calculus method of solution - examples illustrating the tabular method of solution.

TEXT BOOKS:

1. Engineering optimization: Theory and practice - S. S.Rao, New Age International (P) Limited, 3rd edition, 1998.
2. Introductory Operations Research - H.S. Kasene & K.D. Kumar, Springer (India), Pvt .LTd.

REFERENCE BOOKS:

- 1 Optimization Methods in Operations Research and systems Analysis – K.V. Mital and C. Mohan, New Age International (P) Limited, Publishers, 3rd edition, 1996.
2. Operations Research – Dr. S.D.Sharma.
3. Operations Research: An Introduction – H.A. Taha, PHI Pvt. Ltd., 6th edition.
4. Linear Programming – by G. Hadley.

IV year B.Tech – II Sem
(CODE: 3FC03) DATA BASE MANAGEMENT SYSTEMS
(PROFESSIONAL ELECTIVE-II)

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UNIT I:

Data base System Applications, data base System VS file System – View of Data – Data Abstraction – Instances and Schemas – data Models – the ER Model – Relational Model – Other Models – Database Languages – DDL – DML – database Access for applications Programs – data base Users and Administrator – Transaction Management – data base System Structure – Storage Manager – the Query Processor, History of Data base Systems. Data base design and ER diagrams – Beyond ER Design Entities, Attributes and Entity sets – Relationships and Relationship sets – Additional features of ER Model – Concept Design with the ER Model – Conceptual Design for Large enterprises.

UNIT II:

Introduction to the Relational Model – Integrity Constraint Over relations – Enforcing Integrity constraints – Querying relational data – Logical data base Design – Introduction to Views – Destroying /altering Tables and Views.

Relational Algebra – Selection and projection set operations – renaming – Joins – Division – Examples of Algebra overviews – Relational calculus – Tuple relational Calculus – Domain relational calculus – Expressive Power of Algebra and calculus.

UNIT III:

Form of Basic SQL Query – Examples of Basic SQL Queries – Introduction to Nested Queries – Correlated Nested Queries Set – Comparison Operators – Aggregative Operators – NULL values – Comparison using Null values – Logical connectivity's – AND, OR and NOT – Impact on SQL Constructs – Outer Joins – Disallowing NULL values – Complex Integrity Constraints in SQL Triggers and Active Data bases.

UNIT IV:

Schema refinement – Problems Caused by redundancy – Decompositions – Problem related to decomposition – reasoning about FDS – FIRST, SECOND, THIRD Normal forms – BCNF – Lossless join Decomposition – Dependency preserving Decomposition – Schema refinement in Data base Design – Multi valued Dependencies – FORTH Normal Form.

UNIT V:

Transaction Concept- Transaction State- Implementation of Atomicity and Durability – Concurrent – Executions – Serializability- Recoverability – Implementation of Isolation – Testing for serializability- Lock –Based Protocols – Timestamp Based Protocols- Validation- Based Protocols – Multiple Granularity, Recovery and Atomicity – Log – Based Recovery – Recovery with Concurrent Transactions – Buffer Management – Failure with loss of nonvolatile storage-Advance Recovery systems- Remote Backup systems.

UNIT VI:

Data on External Storage – File Organization and Indexing – Cluster Indexes, Primary and Secondary Indexes – Index data Structures – Hash Based Indexing – Tree base Indexing – Comparison of File Organizations – Indexes and Performance Tuning- Intuitions for tree Indexes – Indexed Sequential Access Methods (ISAM) – B+ Trees: A Dynamic Index Structure.

TEXT BOOKS:

1. Data base Management Systems- Raghurama Krishnan, Johannes Gehrke, Tata Mc-Graw Hill 3rd Edition
2. Data base System Concepts- Silberschatz, Korth, McGraw hill, V edition.

REFERENCES:

1. Data base Systems design, Implementation, and Management- Peter Rob & Carlos Coronel 7th Edition.
2. Fundamentals of Database Systems- Elmasri Navrate Pearson Education
3. Introduction to Database Systems- C.J.Date Pearson Education

IV year B.Tech – II Sem
(Code: 3FC10) **NEURAL NETWORKS & FUZZY LOGIC**
(PROFESSIONAL ELECTIVE – II)

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UNIT – I CHARACTERISTICS OF NEURAL NETWORKS:

Historical Development of Neural Networks Principles, Artificial Neural Networks: Terminology, Models of Neuron, Topology, Basic Learning Laws, Pattern Recognition Problem, Basic Functional Units, Pattern Recognition Tasks by the Functional Units.

UNIT – II FEEDFORWARD NEURAL NETWORKS:

Introduction, Analysis of pattern Association Networks, Analysis of Pattern Classification Networks, Analysis of pattern storage Networks. Analysis of Pattern Mapping Networks.

UNIT – III FEEDBACK NEURAL NETWORKS

Introduction, Analysis of Linear Autoassociative FF Networks, Analysis of Pattern Storage Networks.

UNIT – IV FROM CLASSICAL SETS TO FUZZY SETS: A GRAND PARADIGM SHIFT:

Introduction, Crisp Sets: An Overview, Fuzzy Sets: Basic Types, Fuzzy Sets: Basic Concepts, Characteristics and Significance of the paradigm Shift.

Fuzzy Sets Vs Crisp Sets:

Additional properties of α - Cuts, Representations of Fuzzy Sets, Extension Principle for Fuzzy Sets

UNIT – V-OPERATIONS ON FUZZY SETS:

Types of operations, Fuzzy Complements, Fuzzy intersections: T- Norms, Fuzzy Unions: T- Conorms, Combinations of Operations, Aggregation Operations.

Fuzzy Arithmetic: Fuzzy Numbers, Linguistic Variables, Arithmetic Operations on Intervals, Arithmetic Operations on Fuzzy Numbers, Lattice of Fuzzy Numbers, Fuzzy Equations.

UNIT-VI-FUZZY LOGIC:

Classical Logic: An Over View, Multivalued Logic, Fuzzy Prepositions, Fuzzy Quantifiers, Linguistic Hedges, Inference from Conditional Fuzzy Prepositions, **Inference** from Conditional and Quantified Prepositions, Inference from Quantified Prepositions.

TEXT BOOKS

1. Fuzzy Sets and Fuzzy Logic - George J. Klir/ Bo Yuan Printice Hall of India Pvt. Ltd.
2. Artificial neural networks – B. Vegnanarayana, Printice Hall of India P Ltd.

REFERENCES:

1. Artificial Intelligence- E.Rich and K.Knight, 2nd Edition, Tata Mc Graw Hill Publishers.
2. Artificial Intelligence and Expert Systems – Patterson PHI.
3. Expert Systems: Principles and Programming- Fourth Edn, Giarrantana/ Riley, Thomson.
4. PROLOG Programming for Artificial Intelligence, Ivan Bratka- 3rd Edition – Pearson Education.
5. Neural Networks- Simon Haykin, PHI.
6. Artificial Intelligence- 3rd Edition, Patrick Henry Winston., Pearson Edition.

IV Year B.Tech – II Sem

(CODE: 3A819)

FLEXIBLE AC. TRANSMISSION SYSTEMS
(PROFESSIONAL ELECTIVE – III)

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UNIT I - FACTS CONCEPTS:

Transmission interconnections power flow in an AC system, Loading capability limits, Dynamic stability considerations, Importance of controllable parameters basic types of FACTS controllers, Benefits from FACTS controllers.

UNIT II - VOLTAGE SOURCE CONVERTERS:

Single phase three phase full wave bridge converters transformer connections for 12 pulse 24 and 48 pulse operation. Three level voltage source converter, Pulse width modulation converter, Basic concept of current source Converters, Comparison of current source converters with voltage source converters.

UNIT III - STATIC SHUNT COMPENSATION:

Objectives of shunt compensation, Mid point voltage regulation voltage instability prevention, Improvement of transient stability, Power oscillation damping, Methods of controllable var generation, Variable impedance type static var generators switching converter type var generators hybrid var generators.

UNIT IV - SVC AND STATCOM:

The regulation and slope transfer function and dynamic performance, Transient stability enhancement and power oscillation damping operating point control and summary of compensator control.

UNIT V - STATIC SERIES COMPENSATORS:

Concept of series capacitive compensation, Improvement of transient stability, Power oscillation. Damping.

UNIT VI - GSC, TSSC AND TCSC:

Functional requirements. GTO Thyristor controlled series capacitor (GSC), Thyristor switched series capacitor (TSSC) and thyristor controlled series capacitor (TCSC) control schemes for GSC TSSC and TCSC.

TEXT BOOK:

1. "Understanding FACTS Devices" N.G. Hingorani and L. Gygi, IEEE Press Publications.
2. "Flexible AC Transmission Systems" Yong Hau Song & Allah T.Johns, published by IEE London.

REFERENCES:

1. "Flexible AC Transmission Systems, modeling and control" - X.P.Zhang, C.Rehtanz, B.Pal, published by Springer.
2. "Thyristor based facts controllers for electrical transmission systems" - R.Mohan Mathur, Rajiv K.Varma, ISBN0 471 – 20643 – 1, Wiley – IEEE Press.
3. "Facts modeling and Simulation in Power Networks", Ensiqne, Acha, Hugo John Willey Pearsons.
4. "Application of Power Electroncis in Power Systems" - Saifull Khalid, Neeraj Nivas, University Science Press, New Delhi.

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(CODE : 3C834) **IV year B.Tech EEE– II Sem**
COMMUNICATION THEORY
(PROFESSIONAL ELECTIVE – III)

After studying this course, the students will be able to

1. Understand need for modulation, Types of analog modulation such as AM, DSBSC, SSBSC, their generation and detection.
2. Understand types of multiplexing ,and commercial applications of all types of analog modulations
3. Understand the types of angle modulation such as FM, PM, their generation and detection methods, comparison and applications
4. Understand types of Noise, analysis and calculation of noise in AM,DSBSC and SSB
5. Understand the circuits for transmitters and receivers for AM and FM.
6. Understand the ASK, FSK, PSK, DPSK, QPSK demodulation, Coherent and incoherent reception.
7. Understand types of Pulse Modulations such as PAM, PPM, PWM, their generation, detection, and applications, DM, ADM, ADPCM
8. Familiar with Shanon-Fano and Huffman coding,Error control coding :Error detection and correction codes, Block codes, Convolution codes.

UNIT-I

AMPLITUDE MODULATION:

Need for modulation, Types of Amplitude modulation, AM, DSB SC, SSB SC, Power and BW requirements, generation of AM, DSB SC, SSB SC, Demodulation of AM : Diode detector, Product demodulation for DSB SC & SSB SC.

UNIT-II-

ANGLE MODULATION:

Frequency & Phase modulations, Advantages of FM over AM, Bandwidth consideration, Narrow band and Wide band FM, Comparison of FM & PM.

UNIT-III

PULSE MODULATIONS:

Sampling, Nyquist rate of sampling, Sampling theorem for Band limited signals, PAM, regeneration of base band signal, PWM and PPM, Time Divison Multiplexing, Frequency Divison Multiplexing, Asynchronous Multiplexing.

UNIT-IV

DIGITAL COMMUNICATION:

Advantages, Block diagram of PCM, Quantization, Effect of quantization, Quantization error, Base band digital signal, DM, ADM, ADPCM and comparison.

UNIT-V

DIGITAL MODULATION:

ASK, FSK, PSK, DPSK, QPSK demodulation, Coherent and incoherent reception.

UNIT-VI

INFORMATION THEORY:

Concept of information, Rate of information and entropy, Source coding for optimum rate of information, Coding efficiency, Shanon-Fano and Huffman coding.

Error control coding : Introduction, Error detection and correction codes, Block codes, Convolution codes.

TEXT BOOKS:

1. Communication Systems Analog and Digital – R.P. Singh, SD Sapre, TMH, 20th reprint, 2004.
2. Communication Systems- Simon Haykin,Wiley student Edition,2nd Edition

REFERENCES:

1. Electronic Communication Systems – Kennedy & Davis, TMH, 4th edition, 2004.
2. Principle of Communications- Taub & Schilling, TMH, 2003.

IV Year B.Tech – II Sem
HIGH VOLTAGE D.C. TRANSMISSION
(PROFESSIONAL ELECTIVE – III)

(CODE: 3A821)

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OBJECTIVE:

This subject deals with the importance of HVDC transmission, analysis of HVDC converters, Faults and protections, Harmonics and Filters. It also deals with Reactive power control and Power factor improvements of the system.

UNIT – I BASIC CONCEPTS:

Economics & Terminal equipment of HVDC transmission systems, Types of HVDC Links, Apparatus required for HVDC Systems, Comparison of AC & DC Transmission, Application of DC Transmission System, Planning & Modern trends in D.C. Transmission.

UNIT – II ANALYSIS OF HVDC CONVERTERS:

Choice of Converter configuration, analysis of Graetz, characteristics of 6 Pulse & 12 Pulse converters, Cases of two 3 phase converters in star, star mode, their performance.

UNIT – III CONVERTER & HVDC SYSTEM CONTROL:

Principal of DC Link Control, Converters Control Characteristics, Firing angle control, Current and extinction angle control, Effect of source inductance on the system, Starting and stopping of DC link, Power Control.

UNIT-IV MULTI TERMINAL DC SYSTEM:

Introduction, potential applications of MTDC systems, Types of MTDC systems, Series MTDC system, parallel MTDC system, comparison of series and parallel MTDC systems control and protection of MTDC system: current margin method, voltage limiting control, Decentralized current reference balancing, Two ACR method, protection of MTDC systems.

REACTIVE POWER CONTROL IN HVDC

Reactive Power Requirements in steady state, Conventional control strategies, Alternate control strategies, sources of reactive power, AC Filters, Shunt capacitors-synchronous condensers.

UNIT-V CONVERTER FAULT & PROTECTION

Converter faults, Protection against over current and over voltage in converter station, Surge arresters, Smoothing reactors, DC breakers, Audible noise-space charge field, corona effects on DC lines, Radio interference.

UNIT – VI HARMONICS- FILTERS

Generation of Harmonics, Characteristics harmonics, calculation of AC Harmonics, Non- Characteristics harmonics, Adverse effects of harmonics, Calculation of voltage & Current harmonics. Types of AC filters, Design of Single tuned filters.

TEXT BOOKS:

1. HVDC Power Transmission Systems Technology and system Interactions –K.R.Padiyar, New Age International (P) Limited, and Publishers.
2. EHVAC and HVDC Transmission Engineering and Practice – S.Rao.

REFERENCE BOOKS:

1. HVDC Transmission – J.Arrillaga.
2. Direct Current Transmission – E.W.Kimbark, John Wiley & Sons.
3. Power Transmission by Direct Current – E.Uhlmann, B.S. Publications

IV Year B.Tech – II Sem
CONTROL OF ELECTRIC DRIVES
(PROFESSIONAL ELECTIVE – III)

(CODE: 3A823)

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UNIT-I: Introduction of Electrical Control of Machines:

Manual control – Magnetic control – Semi-automatic and Automatic control of Modern machinery – Development of Control Circuits – Two wire and Three wire control – Remote control – Interlocking of drives.

UNIT-II: Control Circuit Components:

Symbols for control components – Fuses, Switches and Fuse Switch units – Moulded Case Circuit Breaker (MCCB) and Miniature Circuit Breaker (MCB) – Contactors – Types of contactors – Contactor ratings.

UNIT-III: Relays:

DC Series current relay – Frequency responsive relay – Latching relay – Over load relays – Bimetallic Thermal over load relay – time delay relay (Timers) – Motor drivers Electronic timer – Phase failure relay – Push button switches – Types, Limit switch – Float switch.

UNIT-IV: Control of Three –Phase Induction Motors:

Motor current at start and during acceleration – Automatic starters – Increment Resistor type starter – Automatic Auto-transformer starter – Open circuit and closed circuit transition – Par winding motor starters Two step and Three step starting – Automatic Star-Delta starters, Open circuit and closed circuit transition – Starters for multi-speed motors. Starters for Wound rotor motors – Control circuit using contactor and flux delay relays.

UNIT-V: Control of DC Motors:

Principles of acceleration – Types of starters for automatic acceleration – Control circuits for DCL, Current limit acceleration starters – Reviewing of DC Motors – Control circuit for direct reversing and forward stop reverse operation – Jugging operation of DC motor – Control circuits for braking action.

UNIT-VI: Control of stepper motors:

Control circuit for Stepper motor – Block diagram of typical step motor control – Types of drive circuits – simple power drive circuit – L/R drive Bi-level drive – Chopper drive – Linear constant current drive – Bipolar drives for Stepper motor – H type and L/R type bipolar drives – Bipolar Chopper drives. Trouble shooting in control circuits – Trouble spots – General procedure for trouble shooting.

TEXT BOOKS:

1. Bhattacharya S. K. and Brijider Singh, Control of Electrical Machines, New Age International Publishers, New Delhi, 1996.
2. Athani V. V. Stopper Motors – Fundamentals, Applications and Design, New Age International Publishers, New Delhi, 1997.

REFERENCE BOOKS:

1. Electric Drives by NK DE & PK SEN, Printice Hall of India Pvt. Ltd.,
2. Control of Electrical Drives by Werner Leonhard, 3rd Edition, Springer.

(CODE: 3A883)

**IV Year B.Tech – II Sem
PROJECT PHASE - II**

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Out of total 200 marks for project work (in the final year second semester), 50 marks shall be for Internal Evaluation and 150 marks for the External Evaluation at the end of the Semester.

External Evaluation of the project (viva-voce) shall be conducted by a committee appointed by the chief superintendent. The committee consists of an external examiner, HoD, a senior faculty member and internal guide.

The pattern of Internal Evaluation is as follows:

Division of marks for internal assessment – 50 marks

- Progress of Project work and the corresponding interim report as evaluated by internal guides at the end of 5 weeks : 05 Marks
- Seminar at the end of 5 weeks : 05 Marks
- Progress of Project work as evaluated by guides at the end of 10 weeks : 05 Marks
- Seminar at the end of 10 weeks : 05 Marks
- Evaluation by the Guides (at the end of 15 weeks) : 10 Marks
- Project Report : 05 Marks
- Final presentation and defense of the project : 15 Marks

If the project is conducted internally the marks supposed to be given by external guide will be given by internal guide himself.

Division of Marks for External Evaluation – 150 Marks

Pattern of External Evaluation for Project

- Final Project Report : 30 Marks
- Presentation : 20 Marks
- Demonstration / Defense of Project : 100 Marks

**(CODE: 3A884) IV Year B.Tech – II Sem
COMPREHENSIVE VIVA - III**

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There shall be a Comprehensive Viva-Voce in IV year II Semester. The Comprehensive Viva-Voce will be conducted by a Committee consisting of an external examiner, Head of the Department and two Senior Faculty members of the Department. The Comprehensive Viva-Voce is aimed to assess the students' understanding in various subjects he/she studied during the B.Tech. course of study up to IV Year. The Comprehensive Viva-Voce is valued for 50 marks by the Committee. There are no internal marks for the Comprehensive Viva-Voce.

(CODE: 3A888) IV Year B.Tech – II Sem TECHNICAL PAPER WRITING AND SEMINAR - IV

L T P/D C
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There shall be a technical seminar evaluated for 25 marks in fourth year second semester. The evaluation is purely internal and will be conducted as follows:

- Preliminary Report on progress of the work and viva 05 marks
- Final report 05 marks
- Presentation and Defence before a departmental committee consisting of Head, a senior faculty and supervisor 15 marks