

# **COURSE STRUCTURE AND DETAILED SYLLABUS**

**for**

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

**in**

**ELECTRONICS AND COMPUTER ENGINEERING**

**(ECM)**

(Applicable for the batches admitted from 2012-2013)



**SREENIDHI INSTITUTE OF SCIENCE & TECHNOLOGY**

**(An Autonomous Institution approved by UGC and affiliated to JNTUH)**

**Yamnampet, Ghatkesar, R.R.District-501 301.**

## B.Tech ECM Course Structure

### First Year - I Semester

Sl. No.	Subject Code	Subject	L	T	P/D	C	Max Marks	
							Internal	External
1	121EN01	English – I	3	-	-	3	30	70
2	121MA01	Engineering Mathematics – I	3	1	-	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 – I	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 Workshop – I	-	-	3/2	1	25	50
<b>Total :</b>			<b>16</b>	<b>4</b>	<b>15</b>	<b>25</b>	<b>330</b>	<b>720</b>

### First Year - II Semester

Sl. No.	Subject Code	Subject	L	T	P/D	C	Max Marks	
							Internal	External
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 & 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	121EE43	Network Analysis	4	-	-	4	30	70
8	121EN72	English Language Lab – II	-	-	2	1	25	50
9	121CS71	Data Structures & 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
<b>Total :</b>			<b>19</b>	<b>7</b>	<b>11</b>	<b>25</b>	<b>310</b>	<b>690</b>

**Second Year - I Semester**

Sl. No.	Subject Code	Subject	L	T	P/D	C	Max Marks	
							Internal	External
1	121MA05	Engineering Mathematics-III	3	2	-	3	30	70
2	121EC05	Electronic Devices and Circuits	3	2	-	3	30	70
3	121ME04	Basic Mechanical Engineering	3	1	-	3	30	70
4	121EE42	Electrical Technology	3	2	-	3	30	70
5	121CS03	Object Oriented Programming Through Java	3	2	-	3	30	70
6	121EM01	Discrete Structures and Graph Theory	3	1	-	3	30	70
7	121BT37	Culture, Values, Professional Ethics and IPR	2	1	-	2	30	70
8	121EN73	Functional and Communicative Written English	-	-	3	2	25	50
9	121EC71	Electronic Devices and Circuits Lab	-	-	3	2	25	50
10	121CS74	Object Oriented Programming Through Java Lab	-	-	3	2	25	50
<b>Total :</b>			<b>18</b>	<b>11</b>	<b>9</b>	<b>26</b>	<b>285</b>	<b>640</b>

**Second Year – II Semester**

Sl. No.	Subject Code	Subject	L	T	P/D	C	Max Marks	
							Internal	External
1	121BT06	Environmental Studies	2	1	-	2	30	70
2	121EM02	Theory of Computation	3	1	-	3	30	70
3	121EC09	Pulse & Digital Circuits	3	1	-	3	30	70
4	121MA07	Probability and Statistics	3	2	-	3	30	70
5	121EC06	Switching Theory and Logic Design	3	1	-	3	30	70
6	121EC08	Signals and Systems	3	1	-	3	30	70
7	121EN74	Effective English Communication and Soft Skills	-	-	3	2	25	50
8	121EM75	Comprehensive Viva-Voce	-	-	-	1	-	50
9	121EC79	Pulse & Digital Circuits Lab	-	-	3	2	25	50
10	121EC72	Basic Simulation Lab	-	-	3/2	1	25	50
11	121EE94	Electrical Technology Lab	-	-	3/2	1	25	50
<b>Total :</b>			<b>17</b>	<b>7</b>	<b>9</b>	<b>24</b>	<b>280</b>	<b>670</b>

### Third Year – I Semester

Sl. No.	Subject Code	Subject	L	T	P/D	C	Max Marks		
							Internal	External	
1		<b>Open Elective- I</b>	3	0	-	3	30	70	
2	121EC13	Linear and Digital IC Applications	3	1	-	3	30	70	
3	121EM03	Computer Organization	3	1	-	3	30	70	
4	121IT03	Database Management Systems	3	1	-	3	30	70	
5	121MB49	Managerial Economics & Financial Analysis	3	1	-	3	30	70	
6	121EC35	Principles of Communication	3	1	-	3	30	70	
7	121MA71	Quantitative Aptitude	-	-	3	2	25	50	
8	121EM76	Group Project	-	-	3	1	25	25	
9	121EC73	Linear & Digital IC Applications Lab	-	-	3	2	25	50	
10	121IT75	Database Management Systems Lab	-	-	3	2	25	50	
		<b>Total :</b>	<b>18</b>	<b>5</b>	<b>12</b>	<b>25</b>	<b>280</b>	<b>595</b>	
1		<b>Open Elective - I</b>							
	121FL01	1. Basic Spanish Language	121IT16		4. Advanced Java Technologies				
	121FL02	2. Basic French Language	121MB55		5. Entrepreneurship				
	121FL03	3. Basic German Language	121IT09		6. Web Technologies				

### Third Year – II Semester

Sl. No.	Subject Code	Subject	L	T	P/D	C	Max marks	
							Internal	External
1		<b>Open Elective-II</b>	3	-	-	3	30	70
2	121EM05	Microprocessors and Microcontrollers	3	1	-	3	30	70
3		<b>Professional Elective-I</b>	3	1	-	3	30	70
4	121CS07	Operating Systems	3	1	-	3	30	70
5	121EM04	Data Communications and Computer networks	3	1	-	3	30	70
6	121IT04	Design and Analysis of Algorithms	3	1	-	3	30	70
7	121MA72	Logical Reasoning	-	-	3	2	25	50
8	121EM77	Comprehensive viva voce	-	-	-	1	-	50
9	121EM71	Microprocessors and Microcontrollers Lab	-	-	3	2	25	50
10	121CS87	Operating Systems & Computer Networks Lab	-	-	3	2	25	50
		<b>Total :</b>	<b>18</b>	<b>5</b>	<b>9</b>	<b>25</b>	<b>255</b>	<b>620</b>
1		<b>Open Elective - II</b>		<b>2</b>		<b>Professional Elective - I</b>		
	121MB56	1. Banking Operations, Insurance & Risk Management	121IT15		1. Multimedia & Image Processing			
	121IT10	2. Neural Networks & Fuzzy Logic	121EC25		2. Cellular & Mobile Communications			
	121EC70	3. Industrial Automation	121EC12		3. Electromagnetic Theory and Transmission Lines			

### Fourth Year – I Semester

Sl. No.	Subject Code	Subject	L	T	P/D	C	Max marks	
							Internal	External
1	121EE07	Control Systems	3	1	-	3	30	70
2	121EM06	Embedded & Real Time Systems	3	1	-	3	30	70
3	121EM07	VLSI Design	3	1	-	3	30	70
4	121IT12	Software Engineering & OOAD	3	1	-	3	30	70
5	121CS08	Compiler Design	3	1	-	3	30	70
6		<b>Professional Elective – II</b>	3	1	-	3	30	70
7	121EC15	Digital Signal Processing	3	1	-	3	25	50
8	121EM78	Pre - Project Seminar	-	-	-	1	50	-
9	121EM79	Industry Oriented Mini Project	-	-	-	2	25	50
10	121EM72	Embedded & WebTechnology Lab	-	-	3	2	25	50
11	121EM73	VLSI Lab (VHDL & Verilog)	-	-	3	2	25	50
		<b>Total:</b>	<b>21</b>	<b>7</b>	<b>6</b>	<b>28</b>	<b>330</b>	<b>620</b>
6		<b>Professional Elective - II</b>						
	121EC14	1. Antennas & Wave Propagation						
	121IT06	2. Computer Graphics						
	121IT05	3. Data Ware Housing & Data Mining						

### Fourth Year – II Semester

Sl. No.	Subject Code	Subject	L	T	P/D	C	Max marks	
							Internal	External
1	121MB02	Management Science	4	-	-	4	30	70
2		<b>Professional Elective - III</b>	4	-	-	4	30	70
3	121EM80	Project	-	-	-	10	50	150
4	121EM81	Comprehensive viva voce	-	-	-	2	-	50
5	121EM82	Technical Seminar	-	-	-	2	25	-
		<b>Total :</b>	<b>8</b>	<b>-</b>	<b>-</b>	<b>22</b>	<b>135</b>	<b>340</b>
2		<b>Professional Elective - III</b>						
	121EC27	Wireless Communication Networks						
	121IT11	Information Security						
	121IT08	Middleware Technologies						

### Third Year – I Semester

Sl. No.	Subject Code	Subject	L	T	P/D	C	Max Marks	
							Internal	External
1		<b>Open Elective- I</b>	3	-	-	3	30	70
2	3C513	Linear and Digital IC Applications	3	1	-	3	30	70
3	3DC03	Computer Organization	3	1	-	3	30	70
4	3FC03	Database Management Systems	3	1	-	3	30	70
5	3ZC01	Managerial Economics & Financial Analysis	3	1	-	3	30	70
6	3C531	Principles of Communication	3	1	-	3	30	70
7	3HC76	Quantitative Aptitude	-	-	2	1	25	50
8	3D577	Group Project	-	-	3	1	25	50
9	3C573	Linear & Digital IC Applications Lab	-	-	4	2	25	50
10	3FC74	Database Management Systems Lab	-	-	4	2	25	50
11	3D591	Technical Paper Writing & Seminar - I	-	-	2	1	25	
		<b>Total :</b>	<b>18</b>	<b>5</b>	<b>15</b>	<b>25</b>	<b>305</b>	<b>620</b>
1		<b>Open Elective - I</b>						
	3HC51	1. Basic Spanish Language	3B515		4. Product and Service Design			
	3HC41	2. Basic French Language	3B516		5. Operations Research			
	3HC46	3. Basic German Language	3ZC04		6. Entrepreneurship			

### Third Year – II Semester

Sl. No.	Subject Code	Subject	L	T	P/D	C	Max marks	
							Internal	External
1		<b>Open Elective-II</b>	3	-	-	3	30	70
2	3DC05	Microprocessors and Microcontrollers	3	1	-	3	30	70
3		<b>Professional Elective-I</b>	3	1	-	3	30	70
4	3EC07	Operating Systems	3	1	-	3	30	70
5	3D604	Data Communications and Computer networks	3	1	-	3	30	70
6	3FC04	Design and Analysis of Algorithms	3	1	-	3	30	70
7	3HC77	Logical Reasoning	-	-	2	1	25	50
8	3D682	Comprehensive viva voce - II	-	-	-	1	-	50
9	3DC71	Microprocessors and Microcontrollers Lab	-	-	4	2	25	50
10	3EC87	OS & CN Lab	-	-	4	2	25	50
11	3D692	Technical Paper Writing & Seminar - II	-	-	2	1	25	-
		<b>Total :</b>	<b>18</b>	<b>5</b>	<b>12</b>	<b>25</b>	<b>280</b>	<b>620</b>
1		<b>Open Elective - II</b>	2		<b>Professional Elective - I</b>			
	3ZC03	1. Banking Operations, Insurance & Risk Management	3FC09		1. Web Technologies			
	3ZC05	2. General Management & Entrepreneurship	3CC25		2. Cellular & Mobile Communications			
	3ZC07	3. Fundamentals of Disaster Management	3FC07		3. Shell Programming & Scripting Languages			
	3ZC12	4. Project Management and Finance						

### Fourth Year – I Semester

Sl. No.	Subject Code	Subject	L	T	P/D	C	Max marks	
							Internal	External
1	3AC07	Control Systems	3	1	-	3	30	70
2	3DC06	Embedded & Real Time Systems	3	1	-	3	30	70
3	3DC07	VLSI Design	3	1	-	3	30	70
4	3FC12	Software Engineering & OOAD	3	1	-	3	30	70
5	3ZC02	Management Science	3	-	-	3	30	70
6		<b>Professional Elective – II</b>	3	1	-	3	30	70
7	3CC15	Digital Signal Processing	4	1	-	4	30	70
8	3D779	Project Phase - I	-	-	2	1	50	-
9	3D778	Industry Oriented Mini Project	-	-	-	2	25	50
10	3DC72	Embedded Systems Lab	-	-	4	2	25	50
11	3DC73	VLSI Lab (VHDL & Verilog)	-	-	4	2	25	50
12	3D793	Technical Paper Writing & Seminar - III	-	-	2	1	25	
		<b>Total:</b>	<b>22</b>	<b>7</b>	<b>12</b>	<b>30</b>	<b>330</b>	<b>620</b>
6		<b>Professional Elective - II</b>						
	3CC14	1. Antennas & Wave Propagation						
	3EC13	2. Software Architecture & Design Patterns						
	3FC05	3. Data Ware Housing & Data Mining						

### Fourth Year – II Semester

Sl. No.	Subject Code	Subject	L	T	P/D	C	Max marks	
							Internal	External
1	3EC08	Compiler Design	3	-	-	3	30	70
2		<b>Professional Elective - III</b>	4	-	-	4	30	70
3	3D880	Project Phase - II	-	-	15	10	50	150
4	3D881	Comprehensive viva voce	-	-	-	2	-	50
5	3D894	Technical Paper Writing & Seminar - IV	-	-	2	1	25	-
		<b>Total :</b>	<b>7</b>	<b>-</b>	<b>17</b>	<b>20</b>	<b>135</b>	<b>340</b>
2		<b>Professional Elective - III</b>						
	3C827	Wireless Communication Networks						3FC15 – Multimedia & Image Processing
	3FC11	Cryptography & Network Security						
	3EC12	Software Project Management						

**I Year B. Tech. ECM - I Sem**

**(121EN01) ENGLISH – I**  
**(Communicative Approaches)**  
**(Common to EEE, ME, ECE, CSE, IT, ECM AND BT)**

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**

**I Year B. Tech. ECM - I Sem****(121MA01) ENGINEERING MATHEMATICS – I**  
**(Common to all branches except Bio-Technology)**

L	T	P/D	C
3	1	-	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

**I Year B. Tech. ECM - I Sem****(121PH01) 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 , point of inflection,  $\bar{e}$  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

**I Year B. Tech. ECM - I Sem****(121CH01) ENGINEERING CHEMISTRY - I****(Common to EEE, ME, ECE, CSE, IT, ECM and BT)**

<b>L</b>	<b>T</b>	<b>P/D</b>	<b>C</b>
<b>2</b>	<b>1</b>	<b>-</b>	<b>2</b>

**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 – 14<sup>th</sup> 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, R.P. Mani, K.N. Krishna B. Rama Devi Cengage Learning, New Delhi 2010
5. Engineering Chemistry by Shiva Shnakar Tata McGraw Hill (2010).

**I Year B. Tech. ECM - I Sem****(121IT01) COMPUTER PROGRAMMING  
(Common to all Branches)**

L	T	P/D	C
3	1	-	3

**UNIT – I**

**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 (Pages 1 – 28 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 (Pages 1019 – 1032 of Text Book 1).

**UNIT – II**

**Introduction to the C language** – Background, C Programs, Structure of a C Program, Comments, the greeting program, identifiers, constants, variables and keywords.

**Types** – void, integral, and floating-point types. Variables – declarations and initialization. Input / Output – Streams, Formatting input and output (Pages 29 – 76 of Text Book 1).

**Expressions** – Primary expressions, post-fix expressions, pre-fix expressions, unary expressions, binary expressions, Precedence and associativity, evaluating expressions, type conversions – implicit type conversion, explicit type conversion, statements – statement type, role of semicolon, statements and defined constants (Pages 94 – 134 of Text Book 1).

**Decision control structures** – Logical data and operators, Two-way selection – if..else, nested if, dangling else, conditional expressions, Multi-way selection – switch statement, else-if (231 – 263 of Text Book 1).

**UNIT – III**

**Repetitive control structures** – Pre-test and post-test loops – initialization and updation, event and counter controlled loops, while, do..while, for, break and continue statements, comma expression (Pages 303 – 348 of Text Book 1).

**Functions** – User-defined functions - Function definition, arguments, return value, prototype, arguments and parameters, inner-function communication. Standard functions – Math functions, Random numbers. Scope – local global (Pages 149 – 199 of Text Book 1).

**Parameter passing** – Call by value and call by reference.

**Recursive functions** – Definition, examples, advantages and disadvantages (Pages 349 – 359 of Text Book 1).

**Macros** – Definition, examples, comparison with functions.

**UNIT – IV**

**Arrays** – Definition and declaration, initialization, accessing elements of in arrays, storing values in arrays, inter-function communication – passing individual elements, passing the whole array, array applications, bubble sort, sequential search. Two dimensional and multidimensional arrays (Pages 459 – 487 and 493, 501 of Text Book 1).

#### **UNIT – V**

**Pointers** – Introduction, pointer constants, pointer values, pointer variables, accessing variables through pointers, pointer declaration and definition, declaration versus redirection, initialization of pointer variables, pointer for inter function communication, pointer to pointers (Pages 557 – 577 of Text Book 1).

**Arrays and pointers** – Pointer arithmetic and arrays, Memory allocation functions – static and dynamic memory allocation, array of pointers (Pages 612 – 633 of Text Book 1).

**Strings** – Input output functions, string handling functions.

#### **UNIT – VI**

**Enumerated, Structure, and Union types** – The type definition (typedef), enumerated types, Structure, Unions (Pages 745 – 786 of Text Book 1).

**Files** – File name, file information table, streams, text and binary streams, stream file processing, system created streams, Standard library I/O functions, file open and close, formatting I/O functions, character I/O functions, Binary I/O, Standard library functions (Pages 393 – 441, 821 – 840 of Text Book 1).

#### **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 by Yashwanth P. Kanetkar 8<sup>th</sup> edition BPB publications.
3. Computer programming for teens by Mary Farrell.

**I Year B. Tech. ECM - I Sem****(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.

**I Year B. Tech. ECM - I Sem****(121EN71) 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, A text book of English Phonetics for Indian Students by T. Balasubramanian Mac Millan



**I Year B. Tech. ECM - I Sem****(121PH71) ENGINEERING PHYSICS LAB – I**  
(Common to all branches)

<b>L</b>	<b>T</b>	<b>P/D</b>	<b>C</b>
-	-	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.

**I Year B. Tech. ECM - I Sem****(121CH71) ENGINEERING CHEMISTRY LAB****(Common to EEE, ME, ECE, CSE, IT, ECM and BT)**

<b>L</b>	<b>T</b>	<b>P/D</b>	<b>C</b>
-	-	3/2	1

**Minimum any Six of the following Experiments**

1. Estimation of  $\text{MnO}_2$  in Pyrolusite.
2. Estimation of Hardness of water.
3. Estimation of  $\text{Mn}^{+2}$  /  $\text{Cu}^{+2}$  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 penetration Test.

**I Year B. Tech. ECM - I Sem****(121IT71) COMPUTER PROGRAMMING LAB**

L	T	P/D	C
-	-	3	2

**1. Unit I (Cycle 1)**

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

**2. Unit II (Cycle 2)**

1. Write an algorithm, flowchart, and C program for:
  1. Finding the area and circumference of a circle of given radius.
  2. Finding the volume of a sphere of given radius.
  3. Finding the lateral surface area of a right circular cone of given base radius and height.
  4. Finding selling price of an item, given its cost price and profit percent.
  5. Finding the interest on a given principal for a given period of time at a given rate of per year.
2. Write a C program to display all the sizes of data types in C.
3. 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)**

1. Write a C program to find the roots and nature of the roots of a quadratic equation, given its coefficients.
2. Write a C program for finding the largest of three given numbers.
3. 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)**

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

**5. Unit III (Cycle 5)**

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

**6. Unit III (Cycle 6)**

1. Write C functions for the following:
  1. 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  $n^{\text{th}}$  Fibonacci number.
2. 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)**
  1. 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.
  2. 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.
  3. 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)**
  1. Write a C program to implement the operations of matrices – addition, subtraction, multiplication.
  2. 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)**
  1. Write a function to swap two numbers.
  2. 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)**
  1. 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.
  2. Define a structure point. Write a program to find the distance between two points.
  3. 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)**
  1. 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.

**I Year B. Tech. ECM - I Sem**

**(121ME71) ENGINEERING WORKSHOP- I**  
**(Common to all branches)**

<b>L</b>	<b>T</b>	<b>P/D</b>	<b>C</b>
-	-	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

**I Year B. Tech. ECM - I Sem****(121IT72) IT WORKSHOP - I**  
(Common to all branches)

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

**Week1:**

**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.

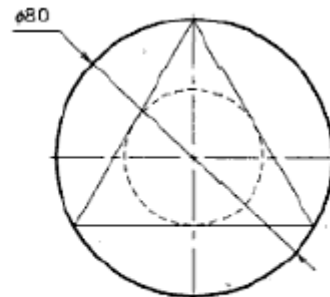
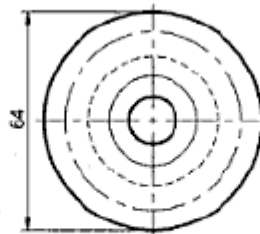
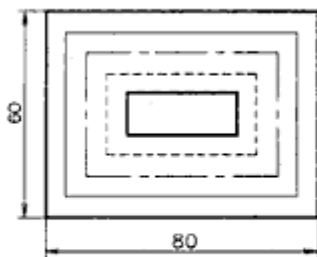
**Cyber Ethics:** Access websites and email, effectively and securely browse (banksites, https webpages) and share the data, categories of websites (.com, .in, .edu, .org).

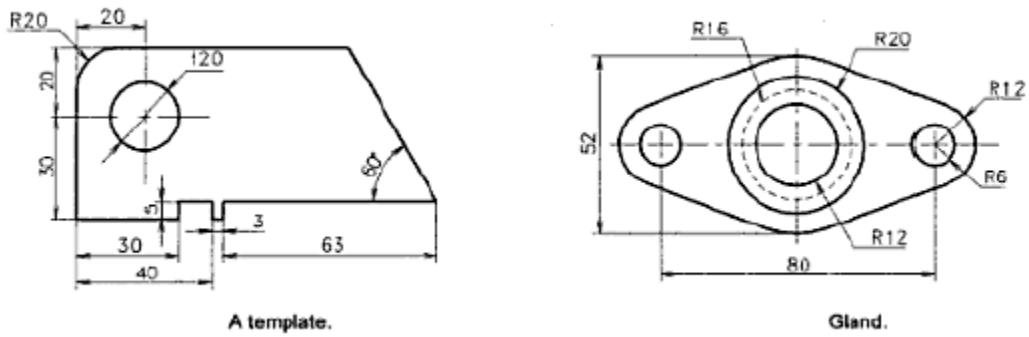
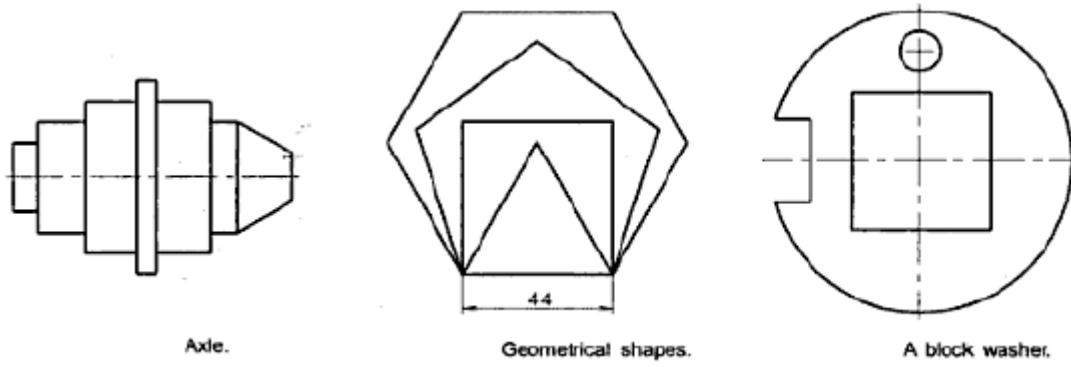
**Week 7: Drafting of 2D Figures:**

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, Fillet, 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. ECM - II Sem**

**(121EN02) English – II**  
**(English Language Teaching Through Literature)**  
**(Common to all branches)**

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.



**I Year B. Tech. ECM - II Sem****(121MA03) 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 transform, 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 & R.K. Jain, Narosa Publishing House, 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

**I Year B. Tech. ECM - II Sem****(121PH02) 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 by W. Ashcroft, N. David Mermin
3. Solid State Physics by S L Singal
4. Physics for semiconductor devices by Michael Shur
5. Nanotechnology: A Gentle Introduction To The Next Big Idea by M Ratner, D Ratner
6. Nano Materials by A K Bandyopadhyay

**I Year B. Tech. ECM - II Sem****(121CS01) DATA STRUCTURES & C++  
(Common to all branches)**

<b>L</b>	<b>T</b>	<b>P/D</b>	<b>C</b>
<b>4</b>	<b>1</b>	<b>-</b>	<b>4</b>

**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

**I Year B. Tech. ECM - II Sem****(121ME02) ENGINEERING DRAWING – II**  
(Common to all branches)

<b>L</b>	<b>T</b>	<b>P/D</b>	<b>C</b>
<b>1</b>	<b>-</b>	<b>3</b>	<b>2</b>

**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. ECM - II Sem****(121CH02) ENGINEERING CHEMISTRY – II****(Common to EEE, ME, ECE, CSE, IT and ECM)**

<b>L</b>	<b>T</b>	<b>P/D</b>	<b>C</b>
<b>2</b>	<b>1</b>	<b>-</b>	<b>2</b>

**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 Tropesch'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 – 14<sup>th</sup> 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).

**I Year B. Tech. ECM - II Sem****(121EE43) NETWORK ANALYSIS  
(Common to ECE & ECM)**

<b>L</b>	<b>T</b>	<b>P/D</b>	<b>C</b>
<b>4</b>	<b>-</b>	<b>-</b>	<b>4</b>

**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, Super mesh, Super node concept.

**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 : SINGLE PHASE A.C. CIRCUITS:**

R.M.S and Average values, Form factor for different periodic wave forms, Steady state Analysis of R, L, and C ( in series, Parallel and series parallel combinations) with sinusoidal excitation, Concept of self and mutual inductances, Dot convention, Co-efficient of coupling, Series circuit analysis with mutual inductance, Resonance in series and parallel circuits, Concept of band width and Q factor.

**UNIT – IV : NETWORK THEOREMS:**

Tellegens, Superposition, Reciprocity, Thevenin's, Norton's, Maximum Power Transfer and Millman's Theorems statements and problem solving using dependent and independent sources with D.C. excitation.

**UNIT – V : TWO-PORT NETWORKS AND FILTERS:**

Z,Y, ABCD and h-parameters, Conversion of one parameter to another parameter, Condition for reciprocity and symmetry, 2 port network connections in series, Parallel and cascaded configurations, Problem solving, Introduction to frequency selective filters (Low pass, high pass, band pass and band elimination filters).

**UNIT – VI : TRANSIENT ANALYSIS:**

Transient response of R-L, R-C, R-L-C circuits (series combinations only) with D.C. and sinusoidal excitations, Initial conditions, Solution using differential equation approach and Laplace transform methods of solutions.

**Text books:**

1. Engineering Circuit Analysis – William Hayt and Jack E Kemmerly, McGraw Hill 5<sup>th</sup> Edition, 1993.
2. Circuits & Networks – A.Sudhakar and Shyamamohan S.Palli, Tata McGraw Hill, 3<sup>rd</sup> edition.

**References:**

1. Network Analysis - M.E. Vanvalkenberg, 3ed, PHI.
2. Circuit theory (Analysis & Synthesis) – A.Chakravarthy, Dhanpath Rai & Co., 6<sup>th</sup> edition.

**I Year B. Tech. ECM - II SEM****(121EN72) 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

**I Year B. Tech. ECM - II Sem****(121CS71) DATASTRUCTURES AND C++ LAB**  
(Common to all branches)

L	T	P/D	C
-	-	3	2

- Write a C program that implement stack and its operations using arrays
- Write a C program that implement Queue and its operations using arrays.
- Write a C program that uses Stack operations to perform the following
  - Converting infix expression into postfix expression
  - Evaluating the postfix expression
- Write a C program that uses functions to perform the following operations on singly linked list.:
  - Creation
  - Insertion
  - Deletion
  - Traversal
- Write a C program that uses functions to perform the following operations on doubly linked list.:
  - Creation
  - Insertion
  - Deletion
  - Traversal in both ways
- Write a C program that uses functions to perform the following:
  - Creating a Binary Tree of integers
  - Traversing the above binary tree in preorder, inorder and postorder.
- 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 :
  - Linear search
  - Binary search
- Write C programs that implement the following sorting methods to sort a given list of integers in ascending order:
  - Bubble sort
  - Quick sort
- Write C programs that implement the following sorting methods to sort a given list of integers in ascending order:
  - Insertion sort
  - Merge sort
  - Selection Sort
- 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.
- 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.
- Write a C++ program that checks whether a given string is palindrome or not.

**TEXT BOOKS:**

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

**I Year B. Tech. ECM - II Sem****(121ME72) ENGINEERING WORK SHOP – II****(Common to all branches except CSE & IT)**

<b>L</b>	<b>T</b>	<b>P/D</b>	<b>C</b>
-	-	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

**I Year B. Tech. ECM - II Sem****(121PH72) ENGINEERING PHYSICS LAB – II**  
(Common to all branches)

<b>L</b>	<b>T</b>	<b>P/D</b>	<b>C</b>
-	-	3/2	1

1. Energy gap of a semiconductor
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

**II Year B. Tech. ECM - I Sem****(121MA05) ENGINEERING MATHEMATICS – III  
(Common to All Branches except Bio-Tech)**

<b>L</b>	<b>T</b>	<b>P/D</b>	<b>C</b>
<b>3</b>	<b>2</b>	<b>-</b>	<b>3</b>

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

Solution by Taylor's series – Picard's Method of successive Approximations – Euler's Method – Runge-Kutta Methods, Predictor-Corrector 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.

**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

**II Year B. Tech. ECM - I Sem**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>2</b>	<b>-</b>	<b>3</b>

**CODE: (121EC05)****Electronic Devices and Circuits****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.

**UNIT- II**

**PN JUNCTION DIODE:** p-n junction diode under reverse & forward bias,-transient and AC conditions- non ideal junctions-break down of junctions (Avalanche and Zener Break down)-Zener Diode Characteristics Diode applications.

**UNIT-III**

**BIPOLAR JUNCTION TRANSISTOR:** Fundamentals of BJT operation – saturation ,active and cut off characteristics –switching characteristics- minority carriers 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, output impedance .CE amplifier-its analysis and frequency response.

**UNIT-IV**

**FIELD EFFECT TRANSISTOR:** JFET characteristics (Qualitative and quantitative discussion) small signal model of JFET and MOSFET characteristics (Enhancement and depletion mode); Symbols of MOSFET ,Comparison of Transistors .Introduction to SCR and UJT.

**UNIT- V**

**TRANSISTOR AMPLIFIERS:** Analysis 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 and 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,BSP
3. Electronic Devices and Circuits by Sanjeev Guptha,Dhapat Rai Publications.

**II Year B. Tech. ECM - I Sem****(121ME04) BASIC MECHANICAL ENGINEERING****(Common to all branches except Bio-Technology)**

<b>L</b>	<b>T</b>	<b>P/D</b>	<b>C</b>
<b>3</b>	<b>1</b>	<b>-</b>	<b>3</b>

**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.

**II Year B. Tech. ECM - I Sem****(121EE42) ELECTRICAL TECHNOLOGY  
(Common to ECE & ECM)**

<b>L</b>	<b>T</b>	<b>P/D</b>	<b>C</b>
<b>3</b>	<b>2</b>	<b>-</b>	<b>3</b>

**UNIT – I :****D.C. GENERATORS :**

Principle of operation, Constructional features, Armature windings – lap and wave windings, E. M.F equation, Types of D.C generators, Load characteristics of shunt, series and compound generators.

**UNIT –II :****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, Principle of 3 point starter, Losses, efficiency.

**UNIT-III :****SINGLE PHASE TRANSFORMERS :**

constructional details, Types, E.M.F equation, Operation on no load and on load, Phasor diagrams, Equivalent circuit, Losses and efficiency, Regulation, Predetermination of efficiency and regulation by OC and SC test.

**UNIT-IV :****POLY PHASE INDUCTION MOTORS:**

Introduction to three phase supply, Phase sequence, Y and  $\Delta$  connected loads, Polyphase induction motors – Construction details of cage and wound rotor machines, Production of a rotating magnetic field, Principle of operation, rotor E.M.F, rotor frequency, rotor reactance, rotor current and pf at standstill and running operation, Torque derivation, Slip – torque characteristic.

**UNIT-V :****SYNCHRONOUS MACHINES:**

Constructional Features of round rotor and salient pole machines, Distribution, pitch and winding factors, E.M.F Equation, Synchronous reactance and impedance, OC and SC tests, Phasor diagram, Regulation by synchronous impedance method, Principle of operation of synchronous motor.

**UNIT – VI :****SINGLE PHASE MOTORS:**

Single phase induction motor, Constructional features, Double field revolving theory, Split phase motors, Shaded pole motor, Principle and operation of Universal motor and Stepper motor.

**TEXT BOOKS:**

1. Basic Electrical Engineering – By M.S.Naidu and S.Kamakshiah – Tata McGraw – Hill Publishers
2. Electric Machines - I.J. Nagrath & D.P. Kothari, Tata McGraw – Hill Publishers, 3<sup>rd</sup> edition, 2004.

**REFERENCE BOOKS:**

1. Principles of Electrical Engineering - V.K.Mehta, S.Chand Publications.
2. Electrical Technology - Edward Huges, Pearson publishers, 8<sup>th</sup> edition.



**II Year B. Tech. ECM - I Sem****(121CS03) OBJECTED ORIENTED PROGRAMMING THROUGH JAVA  
(Common to CSE, IT & ECM)**

L	T	P/D	C
4	1	-	4

**UNIT-I**

History of Java, Java buzzwords, datatypes, variables, simple java program, scope and life time of variables, operators, expressions, control statements, type conversion and casting, arrays, classes and objects – concepts of classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, recursion, string handling, StringTokenizer.

**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 classes, Base class object.

**UNIT-III**

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

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

Introduction to i/o programming: DataInputStream, DataOutputStream, FileInputStream, FileOutputStream, BufferedReader.

**UNIT-IV**

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

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.

**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, card and grid bag.

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

**UNIT-VI**

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

Networking – Basics of network programming, addresses, ports, sockets, simple client server program, multiple clients, sending file from server to client.

**TEXT BOOKS**

1. Java; the complete reference, 6th edition, 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, seventh Edition, Pearson Education.
2. Core Java 2, Vol 2, Advanced Features, Cay.S.Horstmann and Gary Cornell, Seventh Edition, Pearson Education

**II Year B. Tech. ECM - I Sem****(121EM01) DISCRETE STRUCTURES AND GRAPH THEORY  
(Only for ECM)**

L	T	P/D	C
3	1	-	3

**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-5<sup>th</sup> 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.

**II Year B. Tech. ECM - I Sem****(121BT37) CULTURE, VALUES, PROFESSIONAL ETHICS & IPR  
(Common to all branches)**

<b>L</b>	<b>T</b>	<b>P/D</b>	<b>C</b>
<b>2</b>	<b>1</b>	<b>-</b>	<b>2</b>

**UNIT-1 INDIAN CULTURE:**

A Introduction to Culture Values and Ethics, Bharata, The Indian Concept of Human Life, Indian Civilization, Sanskrit and Indian Languages, Festivals, Sculpture, Music, Dance, Drama, Ayurveda, Family and its Importance, Indian Marriage System, Status of Women in Indian Society, Education, Purpose, Ancient System, Value Education, Interfaith Understanding, Happiness, Modernism and its Effect on Lifestyle, Mind and its Operation, Control of Mind, Yoga, Exemplary Life Sketches-Albert Einstein, Abraham Lincoln

**UNIT-II VALUE SYSTEM:**

Human Value System, Truthfulness, Righteousness, Peace, Non-Violence, Love, Kindness and Compassion, Humility, Faith, Courage, Optimism, Forgiveness, Ceiling on Desires (Control of Sense organs), Exemplary Life Sketches-M K Gandhi, Abdul Kalam

**UNIT-III ETHICS:**

Ethics in Ancient India, Ethics, Morals, Ethics and Human Life, Core Areas for Ethics, Values, Morality, Integrity, Honesty, Character, Loyalty, Trustworthiness, Courage and Confidence, Confidentiality, Secrecy and Transparence, Justification, Contracts and Spirit Promises and Schedules, Quarrels, Selfishness, Obstacles, Supporting Measures, Reputation and its sale, Decision Making in Ethics, Exemplary Life Sketches-Vishveshwaraiah, , Jagadeesh Chandra Bose, Meghanad Saha

**UNIT- IV PROFESSIONAL ETHICS:**

Occupation, Profession, Professional, Professional Organization, Obligations Of a Professional, Temptations, Aptitude, Importance of Professional Ethics for Engineers, Code of Ethics, Need for a Code, Impact of Ethical Behaviour, The Code of Ethics for Engineers, Fundamental Principles and Cannons, Commerce and Ethics, Marketing Ethics, Finance and Ethics, Science, Religion and Ethics, Medical Ethics, Genetics and Ethics, Politics and Ethics, Genders and Ethics, Media and Ethics, Computer Ethics  
Exemplary Life Sketches- Narayan Murthy, Homi Jahangir Bhabha

**UNIT –V INTELLECTUAL PROPERTY RIGHTS (IPR):**

Invention and Creativity, Basic Types of Property, Need for Protection of IPR, IP Types Industrial Property (Patents, Trade Marks, Trade Secrets, Industrial Designs and Integrated Circuits), Copyrights and Related Rights, Geographical Indications.

**UNIT-VI**

WIPO Mission and Activities, GATT & Trips, Indian Position on WTO and strategies, Indian IPR legislations-commitments to WTO-Patent Ordinance and the Bill, Draft of a National Intellectual Property Policy, Case Studies on IP

**REFERENCES:**

- 1. The ABCs of Ethics by Michael L. Buckner, Universe. Inc, New York Lincoln, Shangahai**
- 2. Science, Faith and Ethics by Denis Alexander and Robert.S.White, Hendrickson Publishers, Massachusetts, USA, March 2006**
- 3. Vedic Science Primer by PSR Murthy, BS Publications, Hyderabad**
- 4. Medical Ethics-Global View Points, Edited by Diane Andrews, Hennig Feld, Green Haven Press**

**Divine Stories, Human Value Stories, Volume I and II, Sri Satya Sai Books and Publications**

**II Year B. Tech. ECM - I Sem**

**(121EN73) FUNCTIONAL AND COMMUNICATIVE  
WRITTEN ENGLISH  
(Common to all branches)**

<b>L</b>	<b>T</b>	<b>P/D</b>	<b>C</b>
-	-	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 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.

**II Year B. Tech. ECM - I Sem****(121EC71) ELECTRONIC DEVICES AND CIRCUITS LAB**  
(Common to ECE, ECM & EEE)

L	T	P/D	C
-	-	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. ECM - I Sem****(121CS74) Object Oriented Programming through JAVA LAB  
(Common to CSE, IT & ECM)**

L	T	P/D	C
-	-	3	2

1

- A) Write a program to print prime numbers up to a given number.
- B) Write a program to print roots of a quadratic equation  $ax^2+bx+c=0$ .
- C) Write a program to print Fibonacci sequence up to a given number.

2.

- A) Define a class to represent a bank account and include the following members Instance variables:
  - (i)Name of depositor
  - (ii)Account No
  - (iii)Type of account
  - (iv)Balance amount in the account

Instance Methods:

To assign instance variables(Constructors-Zero argument and parameterized)

To deposit an amount

To withdraw amount after checking the balance

(iv) To display name and address

Define ExecuteAccount class in which define main method to test above class.

- B) In the above account class , maintain the total no. of account holders present in the bank and also define a method to display it. Change the main method appropriately.
- C) In main method of ExecuteAccount class , define an array to handle five accounts.
- D) In Account class constructor ,demonstrate the use of “this” keyword.
- E) Modify the constructor to read data from keyboard.
- F) Overload the method deposit() method (one with argument and another without argument)
- G) In Account class , define set and get methods for each instance variable.

Example:

For account no variable, define the methods

getAccountNo() and setAccountNo(int accno)

In each and every method of Account class , reading data from and writing data to instance variables should be done through these variables.

3.

- A) Define Resister class in which define the following members:

Instance variables:

resistance

Instance Methods:

giveData():To assign data to the resistance variable

displayData(): To display data in the resistance variable

constructors

Define subclasses for the Resistor class called SeriesCircuit and ParallelCircuit in which define methods : calculateSeriesResistance( ) and calculateParallelResistance() respectively.Both the methods should take two Resistor objects as arguments and return Resistor object as result.In main method , define another class called ResistorExecute to test the above class.

- B) Modify the above two methods which should accept array of Resistor objects as argument and return Resistor object as result.

4.

- A) Write a program to demonstrate method overriding.
- B) Write a program to demonstrate the uses of “super” keyword (three uses)
- C) Write a program to demonstrate dynamic method dispatch(i.e .Dynamic polymorphism).

- 5)
- Write a program to check whether the given string is palindrome or not.
  - Write a program for sorting a given list of names in ascending order.
  - Write a program to count the no. of words in a given text.
- 6)
- Define an interface “GeomtricShape” with methods area( ) and perimeter( ) (Both method’s return type and parameter list should be void and empty respectively.  
Define classes like Triangle, Rectangle and Circle implementing the “GeometricShape” interface and also define “ExecuteMain” class in which include main method to test the above
- class
- Define a package with name “sortapp” in which declare an interface “SortInterface” with method sort( ) whose return type and parameter list should be void and empty. Define “subsortapp” as subpackage of “sortapp” package in which define class “SortImpl” implementing “SortInterface” in which sort() method should print a message linear sort is used.  
Define a package “searchingapp” in which declare an interface “SearchInterface” with search( ) method whose return type and parameter list should be void and empty respectively.  
Define “searchingimpl” package in which define a “SearchImpl” class implementing “SearchInterface” defined in “searchingapp” package in which define a search( ) method which should print a message linear search is used.  
Define a class ExecutePackage with main method using the above packages(classes and its methods).
- 7)
- Modify the withdraw() method of Account class such that this method should throw “InsufficientFundException” if the account holder tries to withdraw an amount that leads to condition where current balance becomes less than minimum balance otherwise allow the account holder to withdraw and update the balance accordingly.
- 8)
- Define two threads such that one thread should print even numbers and another thread should print odd numbers.
  - Modify the Account class to implement thread synchronization concept.
  - Define two threads such that one thread should read a line of text from text file and another thread should write that line of text to another file.(Thread communication example).
  - Write a program to implement thread priority.
- 9) Design the user screen as follows and handle the events appropriately.
- Add Window
- First Number
- Second Number
- Result
- |  |
|--|
|  |
|  |
|  |
|  |

ADD

SUBTRACT
- 10) Write a program to simulate a calculator
- 11) Write a Java program for handling mouse events and key events.
- 12) a) Write a program for handling window events.  
b) Develop an applet that displays a simple message..
- 13) Develop a client that sends data to the server and also develop a server that sends data to the client(two way communication)
- 14) Develop a client/server application in which client read a file name from keyboard and send the file name to the server , and server will read the file name from client and send the file contents to the client.



**II Year B. Tech. ECM - II Sem****(121BT06) ENVIRONMENTAL STUDIES  
(Common to all Branches)**

L	T	P/D	C
3	1	-	3

**UNIT I: ECOLOGY AND ECOSYSTEMS:** Component of nature, Definition, S Scope and importance, Eco system Definition and concept, Structure and function, Food chain and food web, Ecological pyramids, Biogeo chemical cycles, Ecological niche and succession, Classification (forest, grass land, desert, pond, river, marine, estuarine, wet lands). Environmental organizations (UNEP, WWF, IPCC, MOEN, TERI), Environmental activists- Sunderlal Bahuguna , Baba Amte, Anna Hazare, Medha Patkar, Arundathi Roy, AL Gore.

**UNIT II: METAL IONS IN BIOLOGICAL SYSTEM:** Nitrogen Fixation, Oxygen transport (Hemo globin, Mayogloblin), Electron transfer reaction, Porphyrines(Chlorophil), Metalo enzymes, photo system (PSI, PS II).

**UNIT III: ENVIRONMENTAL CHEMISTRY:** Atmosphere definition, layers, state( weather and climate) acid rain, Green house effect, PAN, Smog, Preliminary concepts of climate change, Ozone layer depletion, Seasons in India, Monsoons, EI Nino, ENSO, Global warming, Kyoto protocol, Montreal Protocol, Carbon Trading, Hydrosphere-definition, Types ( surface and ground water), Distribution, Water conservation, Use and over exploitation, Floods, Drought, dams-benefits and problems, Conflicts over water, Litho sphere- chemical composition of earth (core,montle,crust), Minerals 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:** 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, BOD, COD, DO, Drinking Water treatment and Standards.

**UNIT VI: POLLUTION CONTROL:** Waste water treatment, Case studies: Ganga water pollution, Mercury pollution- Minamatabay disease, Water( prevention and control of pollution) Act 1974, Definition, Causes, Effect and Control measures: Soil pollution, Noise Pollution and Marine Pollution, Waste management- Solid waste Hazardous waste and E-Waste Management, Disaster Management Floods, Earth quakes and Cyclones.

**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.

**REFERENCE BOOKS:**

1. ENVIRONMENTAL SCIENCES-A NEW APPROACH by Purohit, shammi and Agarwal, Agrobios (India) 2004.
2. ENVIRONMENTAL SCIENCES-A Text book for Undergraduate by Dr. K.Mukkanti, S. Chand & Company Ltd., 2010.

**II Year B. Tech. ECM - II Sem****(121EM02) THEORY OF COMPUTATION**  
(Common to ECM, CSE & IT)

L	T	P/D	C
4	-	-	4

**UNIT - I**

**Fundamentals :** Strings, Alphabet, Language, Operations, Finite state machine, definitions, finite automaton model, acceptance of strings, and languages, deterministic finite automaton and non deterministic finite automaton, transition diagrams and Language recognizers.

**UNIT - II**

**Finite Automata :** NFA with  $\epsilon$  transitions - Significance, acceptance of languages. Conversions and Equivalence : Equivalence between NFA with and without  $\epsilon$  transitions, NFA to DFA conversion, minimisation of FSM, equivalence between two FSMs, Finite Automata with output- Moore and Melay machines.

**UNIT - III**

**Regular Languages :** Regular sets, regular expressions, identity rules, Constructing finite Automata for a given regular expressions, Conversion of Finite Automata to Regular expressions. Pumping lemma of regular sets, closure properties of regular sets (proofs not required).

Regular grammars-right linear and left linear grammars, equivalence between regular linear grammar and FA, inter conversion, Context free grammar, derivation trees, sentential forms.

Right most and leftmost derivation of strings.

**UNIT - IV**

**Context Free Grammars :** Ambiguity in context free grammars. Minimisation of Context Free Grammars. Chomsky normal form, Greiback normal form, Pumping Lemma for Context Free Languages. Enumeration of properties of CFL (proofs omitted).

Push down automata, definition, model, acceptance of CFL, Acceptance by final state and acceptance by empty state and its equivalence. Equivalence of CFL and PDA, interconversion. (Proofs not required).

Introduction to DCFL and DPDA.

**UNIT - V**

**Turing Machine :** Turing Machine, definition, model, design of TM, Computable functions, recursively enumerable languages. Church's hypothesis, counter machine, types of Turing machines (proofs not required).

**UNIT - VI**

**Computability Theory :** Chomsky hierarchy of languages, linear bounded automata and context sensitive language, LR(0) grammar, decidability of, problems, Universal Turing Machine, undecidability of posts. Correspondence problem, Turing reducibility, Definition of P and NP problems, NP complete and NP hard problems.

**Text Books :**

1. Introduction to Automata Theory Languages and Computation?. Hopcroft H.E. and Ullman J. D. Pearson Education
2. Introduction to Theory of Computation? Sipser 2nd edition Thomson

**References :**

1. Introduction to Computer Theory, Daniel I.A. Cohen, John Wiley.
2. Introduction to languages and the Theory of Computation ,John C Martin, TMH
3. Elements of Theory of Computation?, Lewis H.P. & Papadimition C.H. Pearson /PHI.
4. Theory of Computer Science ? Automata languages and computation -Mishra and Chandrashekar, 2nd edition, PHI

**II Year B. Tech. ECM - II Sem****(121EC09) PULSE & DIGITAL CIRCUITS**  
(Common to ECE & ECM)

L	T	P/D	C
3	1	-	3

**UNIT –I****LINEAR WAVE SHAPING:**

RC high pass, low pass circuit response for sinusoidal, step, pulse, square, ramp & exponential inputs- Differentiator – Double differentiator – Integrator- RL, RLC ALC, circuits Ringing circuit.

**UNIT –II****NON LINEAR WAVE SHAPING:**

Diode clippers- Transistor clipper- clipping at two independent levels – Emitter coupled clipper-comparator- Diode differentiator comparator – Applications of voltage comparators.  
Clamping operation – clamping with source, diode resistances- clamping circuits theorem- practical clamping circuits.

**UNIT –III****STEADY STATE SWITCHING CHARACTERISTICS OF TRANSISTOR:**

The transistor as a switch – the transistor at cutoff- the transistor in saturation- Analytic expression for transistor characteristics-Analysis of cutoff & saturation regions transistor switching times. Design of transistor switch.

**UNIT –IV****TIME BASE GENERATORS:**

General features of time base signals-sweep circuit using a transistor switch- General considerations & principles of miller & book strap time base generators- the transistor miller time base- the transistor boot strap time base generator- A simple current sweep transistor current time base generator.

**UNIT –V****MULTIVIBRATORS:**

Stable states of Bistable Multivibrator A fixed bias transistor Bistable Multivibrator -A self biased transistor Bistable Multivibrator - commutating capacitor – unsymmetric triggering of Bistable Multivibrator - triggering through a unilateral device- symmetrical triggering – Schmitt trigger circuit.  
General operation of monostable multivibrator, collector coupled monostable multivibrator - wave forms of collector coupled monostable multivibrator - Emitter coupled monostable multivibrator - triggering of monostable multivibrator Astable multivibrator, collector coupled Astable multivibrator -Emitter coupled Astable multivibrator.

**UNIT –VI****SAMPLING GATES:**

Basic operating principle unidirectional, Bidirectional sampling gates using diodes, transistors- reduction of pedessed sampling scope.

**LOGIC GATES:**

Digital operation of a system- the OR gate- the AND gate- the Not circuit or gate circuit- NAND & NOR gates (DTL Logic) – RTL Logic, TTL logic.

**Text Books:**

1. Pulse digital and switching wave forms-J. Millman and H. Taub, Tata McGraw-Hill, New Delhi,2001.
2. Solid State Pulse circuits - David A. Bell, PHI, 4th Edn., 2002 .

**References:**

1. Pulse and Digital Circuits – A. Anand Kumar, PHI, 2005.
2. Wave Generation and Shaping - L. Strauss.

**II Year B. Tech. ECM - I Sem****(121MA07) PROBABILITY AND STATISTICS**

(Common to All Branches)

L	T	P/D	C
3	2	-	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,  $\chi^2$  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, 6<sup>th</sup> 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

**II Year B. Tech. ECM - II-Sem****(121EC06) SWITCHING THEORY AND LOGIC DESIGN****(Common to all branches except Bio-Technology & Mechanical)**

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.

**Textbooks:**

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

**Reference Books:**

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

**II Year B. Tech. ECM - II Sem****(121EC08) SIGNALS AND SYSTEMS****(Common to ECE, ECM & EEE)**

L	T	P/D	C
3	1	-	3

**UNIT- I: 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, Exponential and sinusoidal signals, Concepts of Impulse function, Unit step function, Signum function. Classification of signals periodic, non-periodic, energy and power signals.

**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.

**UNIT-II: 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. **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-III: SIGNAL TRANSMISSION THROUGH LINEAR 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, Detection of periodic signals in the presence of noise by correlation, Extraction of signal from noise by filtering.

**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.

**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, 2<sup>nd</sup> Edn.

**References:**

1. Signals & Systems – Simon Haykin and Van Veen, Wiley, 2<sup>nd</sup> Edition.
2. Network Analysis – M.E. Van Valkenburg, PHI Publications, 3rd Edn., 2000.
3. Fundamentals of Signals and Systems Michel J. Robert, MGH International Edition, 2008.
4. Signals, Systems and Transforms – C. L. Philips, J.M.Parr and Eve A.Riskin, Pearson education.3<sup>rd</sup> Edition, 2004.

**II Year B. Tech. ECM - II Sem**

**(121EN74) EFFECTIVE ENGLISH COMMUNICATION  
AND SOFT SKILLS  
(Common to all branches)**

<b>L</b>	<b>T</b>	<b>P/D</b>	<b>C</b>
-	-	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 Whi tmore: Wiley
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. ECM - II Sem**

**(121EM75) COMPREHENSIVE VIVA-VOCE**

<b>L</b>	<b>T</b>	<b>P/D</b>	<b>C</b>
-	-	-	<b>2</b>

**Max Marks: 50**

The Evaluation for Comprehensive Viva-Voce shall be conducted by a committee consisting of Four Senior Faculty members of the Department headed by HOD. The main aim of Comprehensive Viva-Voce is to assess the students understanding in various subjects he / she studied during the B. Tech. course of study. There are no internal marks for the Comprehensive Viva-Voce.

**II Year B. Tech. ECM - II Sem****(121EC79) PULSE & DIGITAL CIRCUITS LAB**  
(Common to ECE & ECM)

<b>L</b>	<b>T</b>	<b>P/D</b>	<b>C</b>
-	-	3	2

**Minimum Twelve 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. Study of Logic Gates with discrete components .
6. Sampling Gates.
7. Astable Multivibrator.
8. Monostable Multivibrator.
9. Bistable Multivibrator.
10. Schmitt Trigger.
11. UJT Relaxation Oscillator.
12. Bootstrap sweep circuit.

**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        |   |              |

**II Year B. Tech. ECM - II Sem****(121EC72) BASIC SIMULATION LAB  
(Common to ECE & ECM)**

<b>L</b>	<b>T</b>	<b>P/D</b>	<b>C</b>
-	-	3/2	1

1. Basic Operations on Matrices
2. Generation of various signals and sequences
3. Operations on signals and sequences
4. Finding even, odd, real, imaginary parts of signal
5. Convolution between signals and sequences
- 6 Auto correlation and Cross correlation between signals and sequences
7. Verification of LTI properties for given system
8. Computation of unit sample, unit step and sine response of given LTI system and verify its realizability and stability
9. Gibbs phenomena
10. Fourier Transform of given signal and plot its magnitude and phase spectrum
11. Waveform synthesis using Laplace transform
12. Locating poles and zeros and plotting pole –zero maps in S-plane and Z-plane for given transfer function
13. Removal of noise by ACF/CCF
14. Sampling theorem verification
15. Extraction of periodic signal masked by noise using Correlation
16. Finding stability of system using inverse Z Transform

**II Year B. Tech. ECM - II Sem****(121EE94) ELECTRICAL TECHNOLOGY LAB**  
(Common to ECE & ECM)

<b>L</b>	<b>T</b>	<b>P/D</b>	<b>C</b>
-	-	3/2	1

**From the following experiments any six to be conducted:**

1. Verification of superposition and Thevenin's theorems.
2. Verification of maximum power transfer theorem.
3. OC & SC tests on Single – Phase transformer (Predetermination of efficiency and regulation at given power factors).
4. Brake test on 3-phase induction motor (performance characteristics).
5. Speed control of DC shunt motor by
  - a) Armature Voltage Control
  - b) Field flux control method
6. Brake test on DC shunt motor
7. Swinburn's test on DC shunt machine
8. Regulation of alternator by Synchronous impedance method.

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III Year B. Tech. ECM - I Sem

L    T    P/D    C  
3    1    -    3

**(3C513) LINEAR AND DIGITAL IC APPLICATIONS**

a	b	c	d	e	f	g	h	i	j	k	l
x	x		x								

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.

*Applications: Design of visitors counter using 555 timer.*

**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.

*Applications: Design of a digital clock.*

**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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III Year B. Tech. ECM - I Sem

L    T    P/D    C  
3    1    -    3

**(3DC03) COMPUTER ORGANIZATION**  
(Common to ECM, ECE, EEE & IT)

a	b	c	d	e	f	g	h	i	j	k	l
	x	x		x							

**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.

**Objective:** Student can able to know various functional units of the system, types of the system and the interconnection through common bus with system performance evaluation.

**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.

**Objective:** Student can understand how computer programmes are organized, stored and executed at system level.

**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.

**Objective:** Ability to learn the microprogramming concept. Usage of micro code for typical instructions and also the principles of hard wired and micro programmed control.

**UNIT - IV**

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

**Objective:** Student can able to describe arithmetic algorithms and implementation of these with digital hardware.

**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.

**Objective:** Student can able to learn the memory hierarchy, components of the memory and types of memory with various memory management schemes.

**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.

**Objective:** Student can able to learn input / output mechanism used to connect computers with external environments and parallel interface circuits. Can also learn the standard serial communication protocols.

**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.



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III Year B. Tech. ECM - I Sem

L	T	P/D	C
3	1	-	3

**(3FC03) DATA BASE MANAGEMENT SYSTEMS**

a	b	c	d	e	f	g	h	i	j	k	l
x	x		x								

**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.

**Objective:** At the end of this unit, students should be able to know about the applications of DBMS, steps in designing data base and have the basic idea of Database Management System architecture.

**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.

**Objective:** At the end of this unit, students should be able to know about the mathematical languages used in designing relational models – relational calculus and algebra.

**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.

**Objective:** At the end of this unit, students should be able to write complex sql queries to create database and manipulate the data.

**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.

**Objective:** Students should be able to know about the problems caused by redundancy and to eliminate duplicate information from the database by using different types of normal forms.

**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 Protocols- Validation Based Protocols–Multiple Granularity, Recovery & Atomicity–Log Based Recovery–Recovery with Concurrent Transactions–Buffer Management–Failure with loss of nonvolatile storage-Advance Recovery systems- Remote Backup systems.

**Objective:** Students should be able to know about the properties of transactions, different techniques to ensure the serializability and different algorithms to recover data in case of system crash.

**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.

**Objective:** At the end of this unit, students should be able to know about physical level configuration of data using Indexed Sequential Access Method and B+ trees.

**TEXT BOOKS :**

1. Database Management Systems, Raghurama Krishnan, Johannes Gehrke, TMH 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

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III Year B. Tech. ECM - I Sem

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3	1	-	3

## (3ZC01) MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>e</b>	<b>f</b>	<b>g</b>	<b>h</b>	<b>i</b>	<b>j</b>	<b>k</b>
								x		

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

**(3CC35) PRINCIPLES OF COMMUNICATIONS**

a	b	c	d	e	f	g	h	i	j	k	l
x	x	x		x					x	x	x

**UNIT-I****LINEAR MODULATION**

Introduction to Analog communications, Frequency translation, Amplitude modulation-spectrum of AM signals-power relations. Double sideband suppressed carrier and single sideband modulation- spectrum of DSB/SC and SSB signals. Vestigial sideband modulation and spectrum.

Generation and Detection of AM/DSBSC/SSB/VSB/ISB signals. Frequency translation and frequency division multiplexing. Propagation characteristics of AM signals, Commercial Applications.

**Objective**

On completion of the unit student will be able to :

Identify the need for modulation, amplitude modulation and various AM methods along with their generation and detection, frequency spectra of all AM methods, advantages and disadvantages of all AM methods.

**UNIT-II****ANGLE MODULATION**

Frequency modulation-Narrowband FM and wideband FM- spectrum of FM signals-Transmission bandwidth. Generation of FM signals- direct and indirect methods, Detection of FM signals. Propagation characteristics of FM. Phase modulation-relationship between FM and PM signals, Commercial Applications.

**Objective**

On completion of the unit student will be able to :

Explain different types of generation and detection techniques of FM, Apply concept of modulation index, B.W relating to NBFM & WBFM to simple engineering problems, phase modulation.

**UNIT-III****NOISE AND DISTORTIONS IN COMMUNICATION**

Noise in base-band systems-SNR at the output of a base-band system-SNR improvement. Noise in linear CW modulation systems-noise in DSB/SC and SSB systems-noise in AM systems. Noise in angle modulated systems-Output SNR in angle modulated systems- threshold effects in angle modulated systems. Group and Phase Delays, Intermodulation products.

**Objective**

On completion of the unit student will be able to :

Identify the importance of noise concept in Analog communication systems, calculate SNR in all the modulation techniques( linear and angle modulated systems ).

**UNIT-IV****TRANSMITTERS& RECEIVERS**

Classification of Transmitters, AM Transmitter, FM Transmitter.

Tuned Radio Frequency receivers and super-heterodyne receivers, Noise figure- Image frequency and Intermediate frequency, Automatic gain control, Pre-emphasis and de-emphasis.

**Objective**

On completion of the unit student will be able to :

Understand about transmitters and receivers, importance of Noise figure in Analag Communications ,pre emphasis and De emphasis concepts.

**UNIT-V**

**PULSE MODULATION**

Analog Pulse Modulation: Sampling theorem for base-band and pass-band signals, Pulse Amplitude modulation: generation and demodulation, Time Division Multiplexing system, PPM generation and demodulation, PWM generation and demodulation.

**UNIT-VI**

**Digital Communication Systems**

Model of Digital Communication Systems, advantages, PCM Generation and Reconstruction, Quantization Noise, Non uniform Quantization, DPCM, DM, ADM.

**Digital Modulation Techniques:** Introduction to ASK, FSK, PSK, QPSK, DPSK.

**Objective**

On completion of the unit student will be able to :

Understand Sampling theorem & identify importance of sampling process for various signals, Identify differences between Analog & discrete & digital signals, differences between Flat top and Natural Sampling ,differences between AM,PAM,PWM,PPM, various digital modulation techniques.

**Text Books:**

1. Simon Haykin, *Communication Systems*, 2nd Edition, John Wiley & Sons
2. George Kennedy and Bernard Davis ,*Electronics & Communication System*, TMH 2004 .
3. B.P Lathi ,*Communication Systems*,BS Publications,2006
4. K. Sam Shanmugham ,*Digital and Analog Communication Systems*, John Wiley & Sons

**REFERENCES :**

1. Simon Haykin ,*Digital communications*, John Wiley, 2005
2. B.P. Lathi, “*Modern Digital and Analog Commmunication Systems*” 3rd Ed. Oxford University press.
3. Tomasi, *Electronic communication*, Fundamentals through advanced, Pearson Education
4. Couch, *Digital and Analog Communication Systems*, Pearson Education
5. P.Ramakrishna Rao, *Analog Communications*, 1st edition,TMH
6. K N HariBhat& Ganesh Rao, *Analog Communications*2<sup>nd</sup> edition,pearson publications
7. A.Bruce Calrson, *Communication systems*, third edition, MGH.
8. H. Taub and D. Schilling, *Principles of Communication Systems*, TMH, 2003

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III Year B. Tech. ECM - I Sem

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**(3H676) QUANTITATIVE APTITUDE**  
(Common to All Branches)

a	b	c	d	e	f	g	h	i	j	k	l
x											

**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

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III Year B. Tech. ECM - I Sem

L	T	P/D	C
-	-	3	1

**(3D577) GROUP PROJECT**

a	b	c	d	e	f	g	h	i	j	k	l
x	x		x								

**Pre-Requisites:** All Courses till this semester

**Course Outcomes:**

Students use the concepts learned in the courses, so far, in conceptualizing, designing and executing the modules of the projects.

They also exhibit the interest in learning the modern tools and technologies through the bridge courses arranged in the college, beyond the curriculum, and hence developing the software.

They also inculcate an enthusiasm to use the creative ideas to build the innovative projects which are meeting the current needs of the market and society as a whole.

Through this course, communicative skills and team skills largely improve.

The students learn the ability to work as an individual and in a team.

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. ECM - I Sem

L	T	P/D	C
-	-	4	2

## (3C573) LINEAR AND DIGITAL IC APPLICATIONS LAB

a	b	c	d	e	f	g	h	i	j	k	l
x	x		x								

**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)

8. 3x8 Decoder using IC 74x138
  9. 8 x1 Multiplexer using IC 74x151
  10. 4-bit Binary Adder using IC 74x283
  11. Priority encoder using 74x148
  12. D Flip-Flop IC 74x74
  13. Decade counter using IC74x90
- Shift registers using 74x194



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III Year B. Tech. ECM - I Sem

L	T	P/D	C
-	-	4	2

**(3FC74) DATABASE MANAGEMENT SYSTEMS LAB**

a	b	c	d	e	f	g	h	i	j	k	l
	x	x	x					x			

1. Creation, altering and dropping of tables and inserting rows into a table (use constraints while creating tables) examples using SELECT command.
2. Queries (along with sub Queries) using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION, INTERSET, Constraints. Example: - Select the roll number and name of the student who secured fourth rank in the class.
3. Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.
4. Queries using Conversion functions (to\_char, to\_number and to\_date), string functions (Concatenation, lpad, rpad, ltrim, rtrim, lower, upper, initcap, length, substr and instr), date functions (Sysdate, next\_day, add\_months, last\_day, months\_between, least, greatest, trunc, round, to\_char, to\_date)
5. i) Creation of simple PL/SQL program which includes declaration section, executable section and exception –Handling section (Ex. Student marks can be selected from the table and printed for those who secured first class and an exception can be raised if no records were found)  
ii) Insert data into student table and use COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block.
6. Develop a program that includes the features NESTED IF, CASE and CASE expression. The program can be extended using the NULLIF and COALESCE functions.
7. Program development using WHILE LOOPS, numeric FOR LOOPS, nested loops using ERROR Handling, BUILT –IN Exceptions, USE defined Exceptions, RAISE- APPLICATION ERROR.
8. Programs development using creation of procedures, passing parameters IN and OUT of PROCEDURES.
9. Program development using creation of stored functions, invoke functions in SQL Statement and write complex functions.

Program development using creation of package specification, package bodies, private objects, package variables and cursors and calling stored packages.

Develop programs using features parameters in a CURSOR, FOR UPDATE CURSOR, WHERE CURRENT of clause and CURSOR variables.

Develop Programs using BEFORE and AFTER Triggers, Row and Statement Triggers and INSTEAD OF Triggers

**TEXT BOOKS:**

1. ORACLE PL/SQL by example Benjamin Rosenzweig, Elena Silvestrova, Pearson Education 3rd Ed
2. ORACLE DATA BASE LOG PL/SQL Programming SCOTT URMAN, Tata Mc- Graw Hill
3. SQL & PL/SQL for Oracle 10g, Black Book, Dr.P.S. Deshpande

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**OPEN ELECTIVE – I**  
**(3HC51) BASIC SPANISH LANGUAGE**

**Objectives:** The objectives of this course almost correspond to the A1 level of the Common European Framework of Reference for languages

**A) Aims and Objectives of the Course**

- i) To develop the following skills: Listening, speaking, reading & writing.  
Learners should be able to
  - a) listen and comprehend elementary structures of the spoken language.
  - b) participate in simple conversations in different situations of every day life.
  - c) read and understand simple texts.
  - d) write sentences and short paragraphs on general topics and situations.
  
- ii) To develop creative aspect in language learning i.e. the ability to work out different patterns and combinations with the help of basic grammatical structures and lexical items.
  
- iii) To introduce the learners to aspects of life and culture of Spanish and Latin American people.

**B) Course Contents**

<b>UNITs</b>	<b>Functional Aspects</b>
UNIT-1	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. <b>Grammatical Aspects</b> Basic structure of spelling and pronunciation; present indicative of the regular verbs ('ar'/er/ir,) and 'querer'; subject pronouns; interrogative sentences with 'Por qué ', and 'quién' ; causal phrase with 'porque' ; 'ser' and 'estar' ; negative sentences; adjectives of nationality.
UNIT-2	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. <b>Grammatical Aspects</b> Gender and number of nouns and adjectives; the verb 'tener'; interrogative sentences; demonstrative and qualitative adjectives.
UNIT-3	To express opinions on something, contradict someone in a modest ways, suggest something, to value things aesthetically and intellectually; expression of likes and dislikes; expression and reaction to certain things, (agreement or disagreement). <b>Grammatical Aspects</b> 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', their form and syntax, interrogative pronouns.
UNIT 4	Invitations; accepting and rejecting invitations; how to fix an appointment; <b>Grammatical Aspects</b> Present indicative of irregular verbs, expressions with 'tener' estar prepositional pronouns; interrogative sentences.
UNIT 5	Expression of time; Spanish and Latin American time tables and comparison with Indian time tables. <b>Grammatical Aspects</b> Time with 'ser'
UNIT 6	Expressions relating climate, weather of the day Seasons. Vacations <b>Grammatical Aspects</b> Expressions with the verbs 'ser' and 'hacer'

**Techniques of Instruction**

Without prejudice to the specific language teaching approach adopted by the teacher, the following parameters are suggested for realizing the above objectives and contents:

1. To avoid monotony in the classroom and to reduce the role of mechanical reproduction of the material learnt, stress should be laid on creativity in the classroom.
2. Use of modern technical aids, such as slide projectors, tape recorders, computers, CD-ROMs etc. should be encouraged.
3. Supplementary teaching material on cultural aspects, such as art, films etc. may be used in the classroom. An intercultural approach should be encouraged.
4. Methods/techniques should be employed, which would encourage the learners to do independent work by way of reading writing and self-correction.

**Books recommended:**

1. ELE INICIAL 1
2. Espanol sin Fronteras, A. Sánchez, M. Ríos, J.A. Metalla. SGEL, Madrid, 1997.
3. Entre Nosotros A. Sánchez, M. Ríos, J.A. Metalla. SGEL, Madrid, 1997.

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**OPEN ELECTIVE – I**  
**(3HC41) BASIC FRENCH LANGUAGE**

**UNITE – 1**

**UN PRINTEMPS A PARIS**

**VOCABULAIRE:** Professions et nationalités, vie quotidienne et loisirs,  
Descriptions physiques et psychologiques, nombres cardinaux.

**UNITE – 2**

**GRAMMAIRE :** Articles définis et indéfinis, genre et nombre des noms et des  
Adjectifs, interrogation et négation, conjugaison du présent.

**PHONETIQUE :** Intonation, liaison, voyelles orales et nasales.

**UNITE – 3**

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

**CIVILISATION :** Paris, monuments et lieux publics. La vie de quatre parisiens  
De professions différentes.

**UNITE- 4**

**AVENTURE EN BOURGOGNE**

**VOCABULAIRE:** Logement et nourriture, vêtements et couleurs, fêtes et  
Faits divers, nombres ordinaux.

**GRAMMAIRE :** Articles partitifs, adjectifs démonstratifs et possessifs,  
Prépositions et adverbess de quantité et de lieu, pronoms  
Toniques, l'impératif, verbes pronominaux

**UNITE – 5**

**PHONETIQUE :** Intonation, semi-voyelles, liaison, consonnes sonores et sourdes

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

**UNITE – 6**

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

**In addition Passé Composé will be introduced in the UNITE 2**

Text Book : LE NOUVEAU SANS FRONTIERES – 1 (Text Book and  
(UNIT 1 & UNIT 2) Exercise Book published by CLE INTERNATINAL – Phillippe Dominique et al.

**SCHEME OF EXAMINATION:**

Internal Assessment - 30 marks

Written Examination - 20 marks

Viva Voce - 10 marks

Final Written Examination: Grammar, Communication & Translation 70marks

Written Examination - 50 marks

Viva voce - 20 marks

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**OPEN ELECTIVE – I**  
**(3HC46) BASIC GERMAN LANGUAGE**

DEUTSCH FUR ANFANGER (German for beginners)

Syllabus

1. OBJECTIVE: To introduce the learners to basic German and to acquaint them with German culture. The learners should be able to express themselves in simple sentences on a few day-to-day situations.

2. DURATION: I-Semester

3. CLASSROOM STRENGTH: preferably not exceeding 30

4. MODE: Face-to-Face classroom interaction

5. TEACHING HOUSE: 2 HOURS and 2 TUTORIALS / WEEK

6. COURSE CONTENT:

UNIT 1

- Definite and indefinite articles (including negation)
- Noun: Gender and plural forms, cases (nominative, accusative, dative and genitive)

UNIT 2

- Verb: strong & 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 3

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

UNIT 4

- 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 5

- Pretaritim of sein and haben
- Perfect tense

#### UNIT 6

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

7. READING LIST: One of the following books shall be used (depending upon the availability of the book)

Text book to be recommended out of the following.

- Braun, K., Nieder, L., Schmoe, F.1977. Deutsch als Fremdsprache I. A. Ernst Klett Verlag, Stuttgart.
- Schulz, D., Griesbach, H., 1968. Deutsche Sprachlehre fur Auslander. Max Hueber Verlag. Munchen.
- Hieber, W. 1987. Lernziel Deutsch (Special Indian Edition).Max Hueber Verlag. Munchen
- Neuneer, G., et al. 1979. Deutsch Aktiv. Langenscheidt. Berlin
- Schapers, R., et al. 1980. Grundkkurs Deutsch. I. Verlag fur Deutsch. Munchen
- Schapers, R., et al. 1981 Deutsch 2000 I. Max Hueber Verlag. Munchen
- Haussermann, U. et al. 1995 Sprachkurs Deutsch. Verlag Moritz Diesterweg. Frankfurt/Main.
- Muller, M., et al. 2001 Moment mal ! Langenscheidt. Berlin.
- Jutta Muller, Thomas Storz, 2006. Laguna. Heuber Veerlag, Ismaning. Deutschland.
- Hermann Funk, Christina Kuhn, Oliver Bayerlein., Studio d A 1. 2005 Comelsen Verlag, Berlin.
- Rosa-Marie Dallapiazza, Eduard von Jan, Till Schonherr, unter Mitarbeit von Jutta Orth-Chambah. Tangram aktuell 1 – Lektion 1 – 4, Lektion 5 – 8 2009. Max Hueber Verlag. Munchen.

#### 9. SCHEME OF THE EXAMINATION:

Duration of written papers: 3 hours each

Paper 1 :Grammar and Translation (German > English and vice versa)	100 marks
Paper II: Reading comprehension, letter writing / short easay.	100 marks
Paper III: Viva voce	100 marks

**The minimum marks required for passing in EACH paper: 40 / 100**



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**OPEN ELECTIVE – I**  
**(3B515) PRODUCT & SERVICE DESIGN**

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							x			x	

**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

Recommended Text Books:

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

Additional 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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**OPEN ELECTIVE – I**  
**(3B616) OPERATIONS RESEARCH**

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		x	x							x	

After completing the subject, students will be able to:

- understand the application & techniques of OR & Formulate & Obtain solution problems using linear programming (LP) by different methods
- understand the transportation problem their formulation and solution, understand the job sequencing under different condition
- understand the significance of replacement and the techniques of replacement of various types of items
- understand the Game theory concept & solutions and its industrial significance
- understand the importance of queue system and various possible configuration of queues, concept of inventory system, various inventory models
- concept of stage wise optimization and its implications, concept of simulation and its uses

**UNIT – I**

**INTRODUCTION:** Development – Definition– Characteristics and Phases – Types of models – operation Research models – applications.

**LINEAR PROGRAMMING PROBLEM-** Formulation – Graphical solutions, Simplex method, Artificial variables techniques -Two–phase method, Big-M method -Degeneracy, Duality Principle.

**UNIT – II**

**TRANSPORTATION PROBLEM** – Formulation – Optimal solution, unbalanced transportation problem – Degeneracy.

**ASSIGNMENT PROBLEM** – Formulation – Optimal solution - Variants of Assignment Problem- Unbalanced, Traveling Salesman problem.

**UNIT – III**

**SEQUENCING** – Introduction – Flow Shop sequencing – n jobs through two machines – n jobs through three machines – Job shop sequencing – two jobs through ‘m’ machines.

**REPLACEMENT:** Introduction – Replacement of items that deteriorate with time – when money value is not counted and counted – Replacement of items that fail completely, Group replacement.

#### UNIT – IV

**THEORY OF GAMES:** Introduction – Pure strategies-Minimax (maximin) – Criterion and optimal strategy – Solution of games with saddle points – Mixed Strategies-Rectangular games without saddle points- Dominance principle – 2 X 2 games , m X 2 & 2 X n games -Graphical method.

#### UNIT – V

**WAITING LINES:** Introduction – Single Channel – Poisson arrivals – exponential service times – with infinite population and finite population models– Multichannel – Poisson arrivals – exponential service times with infinite population single channel Poisson arrivals.

**INVENTORY :** Introduction – Single item Deterministic models without shortages– Single item inventory models with one price break and multiple price breaks – Stochastic models – demand may be discrete variable or continuous variable – Instantaneous production. Instantaneous demand and continuous demand and no set up cost.

#### UNIT – VI

**SIMULATION:** Definition – Types of simulation – phases of simulation– applications of simulation – Inventory and Queuing problems – Advantages and Disadvantages – Computers in Simulation.

**DYNAMIC PROGRAMMING:** Introduction – Bellman’s Principle of optimality – Applications of dynamic programming- shortest path problem -capital budgeting problem — linear programming problem.

#### TEXT BOOKS:

1. Operations research / Hira & Gupta
2. Operation Research /J.K.Sharma/MacMilan publishers.

#### REFERENCES:

1. Operations Research / S.D.Sharma/Kedarnath publishers
2. Operations research/V.K.Kapoor

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**OPEN ELECTIVE – I**  
**(3ZC04) ENTREPRENEURSHIP**

a	b	c	d	e	f	g	h	i	j	k	l
x		x	x	x			x	x	x		

**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's. 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, PHI, First Edition, New Delhi, 2007.
- Robert D Hisrich, Michael P Peters, Dean A Shepherd, Entrepreneurship, 6<sup>th</sup> Ed, 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

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**(3D591) TECHNICAL PAPER WRITING AND SEMINAR 1**

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								x	x		x

**Pre-Requisites:** All Courses till this semester

**Course Outcomes:**

- Students identify a topic from the current technical topics of their choice in the electronics & computer engineering domain and the allied fields, after surveying in the internet resources, journals and technical magazines in the library.
- Student learnt to arrange the contents of the presentation and scope of the topic, in an effective manner.
- Each student then presents the technical topic they chose in front of the panel and the fellow students, using the oratory skills.
- Students also face the questions posed by the panel and the students and answer them.

There shall be a Technical Paper writing and seminar evaluated for 25 marks in every semester from III-year I-semester. The evaluation is purely internal and will be conducted as follows:

Paper writing	: 05 marks
Final report	: 05 marks
Presentation before a departmental committee consisting of Head, a Senior Faculty and Supervisor	: 15 marks

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**(3D605) MICROPROCESSORS AND MICROCONTROLLERS**  
(Common to ECM, ECE & EEE)

<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>e</b>	<b>f</b>	<b>g</b>	<b>h</b>	<b>i</b>	<b>j</b>	<b>k</b>	<b>l</b>
	x	x	x	x							

**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.

**Objective:** Student can understand the microprocessor architecture, instructions set and procedures of programming.

**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.

**Objective:** Student can understand the assembly language programs, pin diagram and timing diagrams.

**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.

**Objective:** Student can understand and practice the interfacing related applications of 8255 with 8086 and serial communication.

**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.

**Objective:** Student can design and interface 8051 based microcontroller with regard to embedded systems.

**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.

**Objective:** Student can learn basic assembly language programming concepts in 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.

**Objective:** Student will learn the usage of multiple interrupts of 8251 USART architecture, RS232.

**TEXT BOOKS :**

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

**REFERENCES :**

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



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**(3EC07) OPERATING SYSTEMS**

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	x	x		x							x

**Unit I**

Introduction: Introduction to Operating System Concepts (including Multitasking, multiprogramming, multi user, Multithreading etc.), Types of Operating Systems: Batch operating system, Time-sharing systems, Distributed OS, Network OS, Real Time OS; Various Operating system services, architecture, System programs and calls.

**Unit II**

Process Management: Process concept, process scheduling, operation on processes; CPU scheduling, scheduling criteria, scheduling algorithms -First Come First Serve (FCFS), Shortest-Job-First (SJF), Priority Scheduling, Round Robin(RR), Multilevel Queue Scheduling.

Engg. Applications – Process scheduling in Windows, Linux.

**Unit III**

Process-Synchronization & Deadlocks: Critical Section Problems, semaphores; methods for handling deadlocks-deadlock prevention, Avoidance & Detection; Deadlock recovery.

Memory Management: Logical & Physical Address Space, swapping, Contiguous memory allocation.

**Unit IV**

Memory Management: Paging and Segmentation techniques, Segmentation with paging;

Virtual memory: Demand Paging, Page-Replacement Algorithms, Thrashing.

Engg. Applications – Memory management in Windows, Linux.

**Unit V**

File System: Different types of files and their access methods, directory structures, various allocation methods, disk scheduling and management and its associated algorithms.

**Unit VI**

I/O Systems: I/O Hardware, Application I/O Interface, Kernel, Transforming I/O requests, Performance Issues.

Protection and Security: Goals of protection, Principles of protection, Access matrix, Access control list, Capability List. Security Attacks, Program threats,

**Text Books**

1. Operating System Concepts by Silberchatz Galvin, 8<sup>th</sup> edition.
2. Modern Operating Systems by A. Tanenbaum, 1992, Prentice-Hall.
3. Operating Systems Internals and Design Principles by William Stallings, 4<sup>th</sup> edition, 2001, Prentice-Hall

**References**

1. Operating System By Peterson , 1985, AW.
2. Operating System By Milankovic, 1990, TMH.
3. Operating System Incorporating With Unix & Windows By Colin Ritche, 1974, TMH.
4. Operating Systems by Mandrik & Donovan, TMH
5. Operating Systems By Deitel, 1990, AWL.
6. Operating Systems – Advanced Concepts By Mukesh Singhal , N.G. Shivaratri, 2003, T.M.H

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**(3D604) DATA COMMUNICATION AND COMPUTER NETWORKS**  
(Common to ECM, CSE)

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				x	x							x

**UNIT - I**

Introduction to Data Communications; Networks, the Internet, protocols and standards. Network models: layered tasks, the OSI model, Layers in the OSI model, TCP/IP protocol suite, addressing

**Objective:** Student can learn about the data communication concepts, network standardization models.

**UNIT - II**

Physical layer and media: Data and signals: Analog and digital, periodic analog signals, digital signals, Transmission impairment, Data rate limits, Performance.

Digital transmission: Digital – to – digital conversion, Analog – to – digital conversion, Transmission modes.

Analog transmission: Digital – to – analog conversion, Analog – to – analog conversion.

Bandwidth utilization: Multiplexing and spreading; Multiplexing, Spread spectrum

**Objective:** Student can understand the data and signals, modulation and bandwidth utilization.

**UNIT - III**

Transmission media: Guided media, and unguided media Switching: Circuit – switched networks, Datagram networks, Virtual – circuit networks, Structure of a switch.

**Objective:** Graduate can get knowledge about guided and un-guided media and also about switching circuit.

**UNIT - IV**

Data link layer: error detection and correction; Introduction, Block coding, Linear block codes, Cyclic codes, Checksum Data link control: Framing, Flow and error control, Protocols, Noiseless channels, Noisy channels, HDLC, Point – to – point protocol

**Objective:** Student can understand and implement the concepts of error correction and detection.

**UNIT - V**

**Network Layer :** Virtual circuit and Datagram subnets-Routing algorithm shortest path routing, Flooding, Hierarchical routing, Broad cast, Multi cast, distance vector routing.

Dynamic routing – Broadcast routing. Rotary for mobility. Congestion, Control Algorithms – General Principles – of Congestion prevention policies. Internet working: The Network layer in the internet and in the ATM Networks.

**Objective:** Graduate can learn about congestion control algorithms and routing algorithms.

## **UNIT –VI**

**Transport Layer:** Transport Services, Connection management, TCP and UDP protocols; ATM AAL Layer Protocol.

**Application Layer** – Network Security, Domain name system, SNMP, Electronic Mail; the World WEB, Multi Media.

**Objective:** Student understand the protocols used at the transport and application layer level.

### **TEXT BOOKS :**

1. Computer Networks — Andrew S Tanenbaum, 4th Edition. Pearson Education/PHI
2. Data Communications and Networking – Behrouz A. Forouzan. Third Edition TMH.

### **REFERENCES :**

1. An Engineering Approach to Computer Networks-S.Keshav, 2nd Edition, Pearson Education
2. Understanding communications and Networks, 3rd Edition, W.A. Shay, Thomson
3. Data Communications, William Stallings, Seventh edition.

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**(3FC04) DESIGN AND ANALYSIS OF ALGORITHMS**

a	b	c	d	e	f	g	h	i	j	k	l
x	x							x	x		

**UNIT I:**

Introduction: Algorithm, Pseudo code for expressing algorithms, Performance Analysis-Space complexity, Time complexity, Asymptotic Notation- Big oh notation, Omega notation, Theta notation and Little oh notation, Probabilistic analysis, Amortized analysis.

**Objectives:**

At the end of this unit the student understands the importance of an algorithm, its complexity, and different measures to judge the efficiency of such algorithms.

**UNIT II:**

Divide and conquer: General method, applications-Binary search, Quick sort, Merge sort, Strassen's matrix multiplication.

**Objectives:**

At the end of this unit the student will understand the divide and conquer technique and will be able apply that technique to various problems in the real life applications.

**UNIT III:**

Greedy method: General method, applications-Job sequencing with dead lines, 0/1 knapsack problem, Minimum cost spanning trees, Single source shortest path problem.

**Objectives:**

At the end of this unit the student will understand the greedy method and will be able apply that technique to various problems in the real life applications.

**UNIT IV:**

Dynamic Programming: General method, applications-Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem, All pairs shortest path problem, Traveling sales person problem, Reliability design

**Objectives:**

At the end of this unit the student will understand the dynamic programming technique and will be able apply that technique to various problems in the real life applications.

**UNIT V:**

Backtracking: General method, applications-n-queen problem, sum of subsets problem, graph coloring, Hamiltonian cycles.

Branch and Bound: General method, applications - Travelling sales person problem, 0/1 knapsack problem-LC Branch and Bound solution, FIFO Branch and Bound solution.

**Objectives:**

At the end of this unit the student will understand the backtracking, branch and bound techniques and will be able apply that technique to various problems in the real life applications.

**UNIT VI:**

NP-Hard and NP-Complete problems: Basic concepts, non deterministic algorithms, NP-Hard and NP-Complete classes, Cook's theorem.

**Objectives:**

At the end of this unit the student will understand the classification of problems in view of polynomial time complexity in an abstract way.

**TEXT BOOKS**

1. Fundamentals of Computer Algorithms, Ellis Horowitz, Satraj Sahni and Rajasekharam, Galgotia publications pvt. Ltd.
2. Algorithm Design: Foundations, Analysis and Internet examples, M.T. Goodrich and R. Tomassia, John Wiley and Sons.

**REFERENCES :**

1. Introduction to Algorithms, second edition, T.H. Cormen, C.E. Leiserson, R.L. Rivest, and C. Stein, PHI Pvt. Ltd./ Pearson Education
2. Introduction to Design and Analysis of Algorithms A strategic approach, R.C.T. Lee, S.S. Tseng, R.C. Chang and T. Tsai, Mc Graw Hill.
3. Data structures and Algorithm Analysis in C++, Allen Weiss, Second edition, Pearson education.
4. Design and Analysis of algorithms, Aho, Ullman and Hopcroft, Pearson education.
5. Algorithms – Richard Johnson baugh and Marcus Schaefer, Pearson Education

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**(3HC77) LOGICAL REASONING**  
(Common to All Branches)

a	b	c	d	e	f	g	h	i	j	k	l
x											

**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**

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

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

**Unit – IV**

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

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## (3D682) COMPREHENSIVE VIVA-VOCE - II

a	b	c	d	e	f	g	h	i	j	k	l
								x	x		x

**Pre-Requisites:** All Courses till this semester**Course Outcomes:**

- Students are assessed in the courses they have undergone till the completion of that academic year.
- They are asked to comprehend the concepts in the core subjects and the elective subjects, to make them ready to face technical interviews which improve their employability skills.

There shall be a Comprehensive Viva-Voce in every 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 till II-semester. 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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**(3DC71) MICROPROCESSORS AND MICROCONTROLLERS LAB**  
(Common to ECM, ECE & EEE)

a	b	c	d	e	f	g	h	i	j	k	l
x	x	x	x	x	x					x	

**Course Outcomes :**

Analyze and apply working of 8086.

Compare the various interface techniques. Analyze and apply the working of 8255, 8279, 8259, 8251, 8257 ICs and design and develop the programs.

Learning the Communication Standards.

**Course Objectives :**

- Familiarize the architecture of 8086 processor, assembling language programming and interfacing with various modules.
- The student can also understand of 8051 Microcontroller concepts, architecture, programming and application of Microcontrollers.
- Student able to do any type of VLSI, embedded systems, industrial and real time applications by knowing the concepts of Microprocessor and Microcontrollers.

**Cycle - I**

Introduction to MASM/TASM, KIEL IDE, Familiarization with 8086, 8051 Kits

**8086 ALP using kit and MASM**

- Basic arithmetic and logical operations
- Code conversion decimal arithmetic programs
- String manipulation programs
- 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**

- A/D and D/A interfacing
- Serial interfacing with PC
- Keyboard and display interfacing
- Stepper motor controller
- Traffic light controller
- Real Time clock interface with 8051 using 1<sup>2</sup>C



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**(3EC87) OPERATING SYSTEMS AND COMPUTER NETWORKS LAB**

a	b	c	d	e	f	g	h	i	j	k	l
x	x	x	x								

**Objective:**

- a. To provide an understanding of the language translation peculiarities by designing a complete translator for a mini language.
- b. To provide an understanding of the design aspects of operating system

**Recommended Systems/Software Requirements:**

2. Intel based desktop PC with minimum of 166 MHZ or faster processor with atleast 64 MB RAM and 100 MB free disk space
3. C++ complier and JDK kit

**PART - A**

1. Simulate the following CPU scheduling algorithms  
a) Round Robin b) SJF c) FCFS d) Priority
2. Simulate all file allocation strategies  
a) Sequential b) Indexed c) Linked
3. Simulate MVT and MFT
4. Simulate all File Organization Techniques  
a) Single level directory b) Two level c) Hierarchical d) DAG
5. Simulate Bankers Algorithm for Dead Lock Avoidance
6. Simulate Bankers Algorithm for Dead Lock Prevention
7. Simulate all page replacement algorithms  
a) FIFO b) LRU c) LFU Etc. ...
8. Simulate Paging Technique of memory management.

**Part B**

1. Implement the data link layer framing methods such as  
a) character  
b) character stuffing  
c) bit stuffing.
2. Implement on a data set of characters the three CRC polynomials  
a) CRC 12  
b) CRC 16  
c) CRC CCIP.
3. Implement Dijkstra's algorithm to compute the Shortest path through a graph.
4. Take an example subnet graph with weights indicating delay between nodes. Now obtain Routing table for each node using distance vector routing algorithm.

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**(3D692) TECHNICAL PAPER WRITING AND SEMINAR - II**

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								x	x		x

**Pre-Requisites:** All Courses till this semester

**Course Outcomes:**

- Students identify a topic from the current technical topics of their choice in the electronics & computer engineering domain and the allied fields, after surveying in the internet resources, journals and technical magazines in the library.
- Student learnt to arrange the contents of the presentation and scope of the topic, in an effective manner.
- Each student then presents the technical topic they chose in front of the panel and the fellow students, using the oratory skills.
- Students also face the questions posed by the panel and the students and answer them.

There shall be a Technical Paper writing and seminar evaluated for 25 marks in every semester from III-year I-semester. The evaluation is purely internal and will be conducted as follows:

Paper writing	: 05 marks
Final report	: 05 marks
Presentation before a departmental committee consisting of Head, a Senior Faculty and Supervisor	: 15 marks

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

a	b	c	d	e	f	g	h	i	j	k	l
x				x				x		x	

**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:**

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

**References:**

1. Scott E. Harringam Gregory R. Nichanus: Risk Management & Insurance, TMH, 2009.
2. Geroge E. Rejda: Principles of risk Management & Insurance, 9/e, pearson Education. 2009.
3. G. Koteswar: Risk Management Insurance and Derivatives, Himalaya, 2008.
4. Gulati: Principles of Insurance Management, Excel, 2009.
5. James S Trieschmann, Robert E. Hoyt & David N. Sommer: Risk Mgt. & Insurance, Cengage, 09
6. Dorfman: Introduction to Risk Management and Insurance, 8/e, Pearson, 2009.
7. P.K. Gupta: Insurance and Risk Management, Himalaya, 2009.
8. Vivek & P.N. Asthana: Financial Risk Management, Himalaya, 2009.
9. Jyotsna Sethi & Nishwan Bhatia : Elements of Banking and Insurance, 2/e,PHI, 2012.

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**OPEN ELECTIVE - II**  
**(3ZC05) GENERAL MANAGEMENT & ENTREPRENEURSHIP**

a	b	c	d	e	f	g	h	i	j	k	l
x				x				x	x		

**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

**Books Recommended:**

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

**References:**

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

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

a	b	c	d	e	f	g	h	i	j	k	l
			x		x						

**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.

**Books Recommended:**

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

**References:**

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:**

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

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

a	b	c	d	e	f	g	h	i	j	k	l
		x		x		x			x	x	

**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.

**Books Recommended:**

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



**References:**

1. Jack Meredith, Samuel J. Mantel Jr, “Project Management-A Managerial Approach”, John Wiley
2. John M Nicholas “Project Management for Business and Technology” PHI 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 TMH Publishing Co
5. Project Management: Engineering, Technology and Implementation, Shtub, Bard, Globerson, PHI
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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**PROFESSIONAL ELECTIVE – I**  
**(3FC09) WEB TECHNOLOGIES**

a	b	c	d	e	f	g	h	i	j	k	l
x	x	x						x			

**UNIT-I:** The World Wide Web (WWW), Importance of Hypertext and Hypertext Markup Language, HTML4.1 Common tags- List, Tables, images, forms, frames, Cascading Style Sheets

**Application:**

**UI of web sites: Creation of forms ,frames, and a good user interface , online applications front end**

**UNIT-II:** Introduction to Java Scripts, Dynamic HTML with Java Script, Objects in Java Script, popup windows in JavaScript(alert, prompt, confirm),function declaration usage in JavaScript, Event Handling.

**Application:**

**Dynamic behavior to html, interactive web site preparation. In project: used for validation of username, password, popping of fields dynamically, java script is used for the validation of fields like when username is left blank it should give an error message**

**UNIT-III:** XML: Document type definition, XML Schemas, presenting XML using XSLT, Document Object model, reading the XML document using parsers, DOM parser and SAX parser.

**Application:**

**used for storing configuration details,no predefined tags,used in configuring class details for mapping and database details in hibernate.It focuses on structure of data . In project we have used the xml language in the hibernate configuration file .**

**UNIT-IV:** Importance Web Servers and Application servers in a JAVA based enterprise application development. Installing the Java Software Development Kit, Tomcat Server & Testing Tomcat.

Introduction to **Servlets:** Lifecycle of a Servlet, The Servlet API, The **javax.servelet** package, Reading request parameters, Reading Initialization parameters, reading the context parameters, The **javax.servelet.http** package, Handling Http Request & Responses, Session Tracking using **URL rewriting, Hidden form fields, Cookies, HttpSession**, Security Issues in web Application.

**Application:**

**The term web server, also written as Web server, can refer to either the hardware (the computer) or the software (the computer application) that helps to deliver web content that can be accessed through the Internet.**

**The most common use of web servers is to host websites, but there are other uses such as gaming, data storage, running enterprise applications, handling email, FTP, or other web uses.**

**UNIT-V:** Introduction to JSP: The Problem with Servlet. The Anatomy of a JSP Page, JSP Processing: JSP Application Design with MVC.

JSP Application Development: Generating Dynamic Content, Using Scripting Elements Implicit JSP Objects.

**Application:**

**jsp are used for processing the requests from server,dynamic views**

**UNIT-VI:** Database Access: Database Programming using JDBC, Metadata manipulations through JDBC, Importance of **PreparedStatement** and **CallableStatement**, Studying **javax.sql** package, Accessing a Database from a JSP Page, performing the CRUD operations using JDBC API , importance of a framework usage in a java based web application development, introduction to Struts framework, struts application flow , sample application development using Struts API, Importance of **from bean, action** and **struts-config.xml** in a struts application

**Application:**

**To access database from application, used in almost all web applications .**

**JDBC is a framework used to access the data from the database**

**TEXT BOOKS:**

1. Web programming building internet applications by Chris Bates 2nd edition
2. Head First Servlets & JSP by Bryan Basham, Kathy Sierra, Bert Bates, Publisher: O'Reilly Media

**REFERENCE BOOKS:**

1. Programming World Wide Web by Sebesta.
2. Thinking In Java 4th Edition by Bruce Eckel
3. Learning XML by Erik T. Ray
4. Core SERVLETS ANDJAVASERVER PAGES VOLUME 1: CORE TECHNOLOGIES By Marty Hall and Larry Brown
5. Internet and World Wide Web – How to program by Dietel and Nieto
6. Database Programming with JDBC & Java by George Reese
7. Jakarta Struts Cookbook by Bill Siggelkow

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**PROFESSIONAL ELECTIVE – I  
(3CC25) CELLULAR AND MOBILE COMMUNICATIONS**

a	b	c	d	e	f	g	h	i	j	k	l
x	x		x								

After going through the course, the student will be able to

1. Understand limitations of conventional mobile telephone systems, Basics of cellular mobile systems, Advanced generations of cellular wireless systems.
2. Analyze Frequency reuse concept, Co-channel interference/I ratio importance, Need of improving coverage and capacity in cellular systems using Cell Splitting, Sectoring. Principle of 3. 3. Micro zone concept, design of antenna system to minimize Co-channel interference effect, Classification of diversity techniques.
2. 4 .Understand difference between adjacent channel interference, near end, far end interference. Effects of cell site components due to interference, Concept of UHF TV interference.
3. Analyze signal reflections, path loss, propagation delay/loss, near and long distance propagation loss under different conditions, Merits of Lee model.
4. Analyze frequency allocation of cellular systems, Setup access vs. paging channels, difference between channel assignment and non fixed channel assignment.
5. Understand concept of handoff mechanism, different types of hand off, advantages of hand off, Evaluation of dropped call rates.

**UNIT I**

**INTRODUCTION TO CELLULAR MOBILE RADIO SYSTEMS:**

Limitations of conventional mobile telephone systems, Basic cellular wireless systems; First, second, third and fourth generation cellular wireless systems; Uniqueness of mobile radio environment – Long term fading, factors influencing short term fading , parameters of mobile multi path fading- time dispersion parameters, coherence bandwidth, Doppler spread and coherence time, Types of small scale fading.

**UNIT-II**

**FUNDAMENTALS OF CELLULAR RADIO SYSTEM DESIGN:**

Concept of Frequency reuse, Co-channel Interference, Co-channel Interference Reduction Factor, desired C/I from a normal case in a omni directional Antenna system, System capacity, Trunking and grade of service; Improving coverage and capacity in cellular system – cell splitting, sectoring, micro cell zone concept.

**UNIT-III**

**CHANNEL INTERFERENCE:**

Measurement of real time Co-Channel Interference, Design of antenna system, Antenna parameters and their effects; Diversity techniques- Space diversity, polarization diversity, Frequency diversity and Time Diversity. Non-co-channel interference-Adjacent channel Interference, near end and far end interference, cross talk, effect on coverage and Interference by power decrease, antenna height decrease, effect of cell site components, UHF TVinterference

*Applications: Design of a cellular systems using frequency reuse factor (k=19) for directional and omni-directional antenna systems*

**UNIT-IV**

**CELL COVERAGE FOR SIGNAL AND TRAFFIC :**

Signal reflections in flat and hilly terrain, effect of human made structures, phase difference between direct and reflected paths, constant standard deviation, straight line path loss slope, general formula for mobile propagation over water and flat open area, near and long distance propagation, path loss from a point to point prediction model in different conditions,merits-of-LEE-model.

**UNIT-V**

**FREQUENCY MANAGEMENT AND CHANNEL ASSIGNMENT:**

Numbering and grouping, setup access and paging channels channel assignments to cell sites and mobile units, channel sharing and borrowing, sectorization, overlaid cells, non fixed channel assignment.

**HANDOFF, DROPPED CALLS:**

Handoff initiation, types of Handoff, delayed handoff, Advantages of handoffs, Power difference handoff, forced handoff, mobile assigned handoff and soft handoff, Intersystem handoff. Introduction to dropped call rates and their evaluation.

**UNIT-VI**

**DIGITAL CELLULAR NETWORKS:** GSM architecture, GSM channels, multiplex access scheme , TDMA, CDMA,WCDMA.

**TEXTBOOKS:**

1. Mobile Cellular Telecommunications – W.C.Y. Lee, Tata McGraw Hill, 2rd Edn., 2006.

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III Year B. Tech. ECM - II Sem

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**PROFESSIONAL ELECTIVE – I**  
**(3FC07) SHELL PROGRAMMING & SCRIPTING LANGUAGES**

a	b	c	d	e	f	g	h	i	j	k	l
	x	x						x			

**Unit I:**

Introduction to Unix:- Architecture of Unix, Features of Unix , Unix utilities – process utilities, disk utilities, networking commands, text processing utilities and backup utilities.

Introduction to unix file system, vi editor, file handling utilities, security by file permissions.

**Unit II:**

**Grep** :Operation, grep Family, Searching for File Content.

**Sed** : Scripts, Operation, Addresses, commands, Applications, grep and sed.

**awk**:Execution, Fields and Records, Scripts, Operations, Patterns, Actions, Associative Arrays, String Functions, String Functions, Mathematical Functions, User – Defined Functions, Using System commands in awk, Applications, awk and grep, sed and awk.

**Unit III : Working with the Bash Shell :**

Introduction, Shell responsibilities, pipes and input redirection, output redirection, here documents, running a shell script, shell as a programming language, shell metacharacters, filename substitution, shell variables, command substitution, shell commands, the environment, quoting, test command, control structures, arithmetic in shell, Shell script examples, functions, debugging shell scripts.

**Unit IV : PYTHON**

Introduction to python language, python-syntax, statements, functions, Built-in-functions and Methods, Modules in python, Exception Handling.

**Unit V:**

Integrated Web Applications in python --- Building Small, Efficient python web Systems, Web Application Framework.

**UnitVI:**

**Object-Orientation**:Data in Python, Data Structures in Python, Defining Classes

**The Python Database Interface.**

Database Interfaces, The Underlying Interface Model, Some Database Modules, A Simple Database-Driven Web, SQL/Python Communication.

**TEXT BOOKS :**

1. Unix and shell Programming Behrouz A. Forouzan, Richard F. Gilberg.Thomson.
2. Python Web Programming by Steve Holden

**REFERENCES :**

1. Your Unix the ultimate guide, Sumitabha Das, TMH. 2nd Edition.
2. Programming in Python , Mark Lutz, Oreilly publications
3. Dive into python by Mark Pilgrim

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## (3AC07) CONTROL SYSTEMS

a	b	c	d	e	f	g	h	i	j	k	l
x	x		x								

**UNIT-I**

**INTRODUCTION:** Concepts of control systems-Open loop and close loop control systems and their differences-Classification of control systems, Feed back characteristics, Effects of feed back, Mathematical models- Differential equations, impulse response and transfer functions-Translational and rotational mechanical systems.

**Transfer function representation:**

Transfer function of DC servo motor-AC servo motor-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 feed back 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.

**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 variable and state model. Derivation of state models from block diagrams. Diagonalization - Solving the time invariant state equations - State transition matrix and its properties-Concept of controllability and observability.

**TEXT BOOKS:**

1. Control Systems Engineering - by I.J. Nagrath and M.Gopal, New Age international (pvt.) Ltd.,
2. Modern control Engineering - by Katsuhiko Ogata - Prentice Hall of India Pvt. ltd.,

**REFERENCES:**

1. Control Systems by N.K.Sinha, New Age International Pvt., Ltd.,
2. Automatic control systems by B.C. Kuo
3. Control Systems by NISE
4. "Modeling and control of Dynamic Systems" by Narciso F.Macia George.

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**(3DC06) EMBEDDED & REAL TIME SYSTEMS**  
(Common to ECM, ECE & EEE)

a	b	c	d	e	f	g	h	i	j	k	l
		x		x							

**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)

Objective: At the end of this unit the student should be able to know about Embedded System overview, different technologies, Design challenges and trade-offs.

**UNIT – II**

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

Objective: At the end of this unit the student should be able to know about 8051 Architecture and features, Interfacing of I/O devices to 8051.

**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)

Objective: At the end of this unit the student should be able to know about ARM Processor and its architecture, features.

**UNIT – IV**

**Interfacing with ARM :** LCD Interfacing, Stepper Motor Interfacing, DC motor Interfacing Using PWM, I<sup>2</sup>C and SPI protocol.

**Networked Embedded Systems:** Bus Protocols, I<sup>2</sup>C bus, CAN bus, Ethernet Enabled Systems, Design Example- Elevator Controller. (Ch8 Wolf)

Objective: At the end of this unit the student should be able to know Interfacing of different devices to ARM Processor, Networked Embedded Systems.

**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).

Objective: At the end of this unit the student should be able to know about RTOS concepts like Task, Data, and Shared data problem and Interrupts routines.



## 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).

Objective: At the end of this unit the student should be able to know about Hard Real Time Scheduling saving memory and power, Hands on experience Embedded System to develop.

*Finally Student should able to understand the basic concepts and design of the systems like*

- ✓ An ability to design, implement and evaluate a software and hardware system to meet the desired needs within realistic constraints such as cost and time
- ✓ An ability to use the techniques, skills, and modern engineering tools for designing and testing necessary for practice as an Electronics & Computer professional

### TEXT BOOKS :

1. Computers and Components: principles of embedded *computing* system design, Wayne Wolf, Elseveir.
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, 2<sup>nd</sup> 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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**(3DC07) VLSI DESIGN**  
(Common to ECM, ECE, EEE, CSE & IT)

a	b	c	d	e	f	g	h	i	j	k	l
x	x		x								

After studying this course, the students will be able to

- i. Understand the existing device technologies and IC fabrication process
- ii. Understand the basic electrical properties of the devices and
- iii. Design basic gates, combinational and sequential circuits
- iv. Understand the effect of parasitic on IC power and performance
- v. Understand the operation of memory cells and basic datapath units
- vi. Understand the need for testing and design verification

**UNIT I****INTRODUCTION TO MOS TECHNOLOGIES:** MOS, PMOS, NMOS, CMOS & BiCMOS

**INTRODUCTION TO IC TECHNOLOGY AND FABRICATION PROCESS:** VLSI Design Flow, Oxidation, Lithography, Diffusion, Ion Implantation, Metallisation, Encapsulation, Probe testing, Integrated Resistors and Capacitors [T1-CH1, 2 & 3].

**Application** – CMOS IC Manufacturing**UNIT II**

**BASIC ELECTRICAL PROPERTIES:** Basic Electrical Properties of MOS and BiCMOS Circuits: Ids-Vds relationships, MOS transistor threshold Voltage, gm, gds, Figure of Merit ( $\omega_0$ ), Zpu/Zpd, Latch-Up in CMOS, Pass Transistors [T1-CH2]

**INVERTERS:** NMOS Inverter, Various Pull-Ups, CMOS Inverter Analysis and Design, Bi-CMOS Inverters [T1-CH2]

**UNIT III**

**CIRCUIT DESIGN PROCESSES:** MOS Layers, Stick Diagrams, Lambda-based CMOS Design rules for Wires, Contacts and Transistors, Layout Diagrams for NMOS and CMOS Inverters and Gates, Scaling of MOS circuits, Limitations of Scaling. [T1-CH3]

**GATES:** CMOS Logic Gates and Structures, Switch logic, Layout Diagrams Gates [T1-CH5]

**Application** – IC Physical Design – NAND and NOR**UNIT IV**

**DELAYS:** Sheet Resistance  $R_s$  and its concept to MOS, Area Capacitance Units, Calculations -  $C_g$ ,  $\tau$ -Delays, Driving large Capacitive Loads, Wiring Capacitances, Fan-in and fan-out [T1- CH 4 & 5, T2-CH4]

**UNIT V**

**MEMORY AND SUBSYSTEM DESIGN:** Latches and Registers [T2-CH7], Clocking strategies (Single Phase) [T1-CH5.5], Memory cells (SRAM & DRAM), Adders, Shifter, Multipliers and ALUs [T1- CH8]

**Applications** – SRAM Based FPGAs and Multiply and Accumulate (MAC) Units**UNIT VI**

**INTRODUCTION TO CMOS TESTING:** CMOS Testing, Need for testing, Test Principles, Design Strategies for Test, Chip level Test Techniques, System-level Test Techniques [T1-CH7]

**Applications** – Implementation of basic ATPG

**TEXTBOOKS:**

1. Principles of CMOS VLSI Design - Weste and Eshraghian, Pearson Education, Second Edition, 2009.
2. Digital Integrated Circuits: A Design Perspective - John M. Rabaey, 2/E, 2002

**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. Essentials of VLSI circuits and systems – Kamran Eshraghian, Eshraghian Douglas and A. Pucknell, PHI, 2005 Edition.
4. Modern VLSI Design - Wayne Wolf, Pearson Education, 3rd Edition, 1997.
5. VLSI Technology – S.M. SZE, 2<sup>nd</sup> Edition, TMH, 2003.

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IV Year B. Tech. ECM - I Sem

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**(3FC12) SOFTWARE ENGINEERING & OOAD**

a	b	c	d	e	f	g	h	i	j	k	l
x	x	x	x					x	x	x	

**UNIT I**

Introduction to Software Engineering: The evolving role of software, Changing Nature of Software, Software myths. A Generic view of process: Software engineering- A layered technology, a process framework. Process models: The waterfall model, Incremental process models, Evolutionary process models, The Unified process.

**UNIT II**

Introduction to UML: Importance of modeling, principles of modeling, conceptual model of the UML, Architecture.

Basic Structural Modeling: Classes, Relationships, common Mechanisms, and diagrams.

Advanced Structural Modeling: Advanced classes, advanced relationships, Packages.

**UNIT III**

System models: Context Models, Behavioral models, Data models, Object models, structured methods. Design Engineering: Design process and Design quality, Design concepts, the design model. Creating an architectural design: Software architecture, Data design, Architectural styles and patterns, Architectural Design.

**UNIT IV**

Software Requirements: Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document. Requirements engineering process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.

**UNIT V**

Class & Object Diagrams: Terms, concepts, modeling techniques for Class & Object Diagrams.

Basic Behavioral Modeling-I: Interactions, Interaction diagrams, Use cases, Use case Diagrams, Activity Diagrams.

**UNIT VI**

Advanced Behavioral Modeling: Events and signals, state machines, state chart diagrams.

Architectural Modeling: Component, Deployment, Component diagrams and Deployment diagrams.

CASE STUDY on Unified Library Application.

**TEXT BOOKS**

1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition. McGrawHill International Edition.
2. Grady Booch, James Rumbaing, Ivar Jacobson: The Unified Modeling Language User Guide, Pearson Education.

**REFERENCES**

1. Software Engineering- K.K. Agarwal & Yogesh Singh, New Age International Publishers
2. Software Engineering, an Engineering approach- James F. Peters, Witold Pedrycz, John Wiely.
3. Systems Analysis and Design- Shely Cashman Rosenblatt, Thomson Publications.
4. Software Engineering principles and practice- Waman S Jawadekar, The McGraw-Hill Companies
5. Meilir Page-Jones: Fundamentals of Object Oriented Design in UML, Pearson Education.
6. Pascal Roques: Modeling Software Systems Using UML2, WILEY-Dreamtech India Pvt. Ltd.
7. Atul Kahate: Object Oriented Analysis & Design, The McGraw-Hill Companies.
8. Mark Priestley: Practical Object-Oriented Design with UML, TATA McGrawHill
9. Craig Larman Applying UML and Patterns: An introduction to Object – Oriented Analysis and Design and Unified Process, Pearson Education
10. Software Engineering- Sommerville, 7th edition, Pearson education.
11. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado: UML 2 Toolkit, WILEY-Dreamtech India Pvt. Ltd.

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## (3ZC02) MANAGEMENT SCIENCE

a	b	c	d	e	f	g	h	i	j	k	l
								x			

**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.

**Essential Reading:**

1. A R Aryasri: Management Science, Tata Mc Graw Hill

**Suggested Readings:**

1. Dr. Y. Satyanarayana: Management control systems in competitive environment,
2. Koontz & Wehrich: Essentials of Management, 6/e, TMH, 2005
3. Kotler Philip & Keller Kevin Lane: Market Management 12/e, PHI, 2005
4. 5 Strategic Management, Text and Cases, VSP Rao, V Hari Krishna
5. Thomas N Duening & John M. Ivancevich Management – Principles and Guidelines

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IV Year B. Tech. ECM - I Sem

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**(3CC15) DIGITAL SIGNAL PROCESSING**

a	b	c	d	e	f	g	h	i	j	k	l
x	x		x								

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.

**Applications:** Design of OFDM system for 4G mobile communication system.

**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.

**Applications:** Design of IIR LPF filter with 3 KHz cutoff frequency in 3G.

**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.

**REFERENCE BOOKS:**

1. Fundamentals and applications, Li-Tan, Elsevier
2. Digital Signal Processing: Andreas Antoniou, TATA McGraw Hill , 2006
3. Digital Signal Processing: MH Hayes, Schaum's Outlines, TATA Mc-Graw Hill, 2007.
4. DSP Primer - C. Britton Rorabaugh, Tata McGraw Hill, 2005.
5. Fundamentals of Digital Signal Processing using Matlab – Robert J. Schilling, Sandra L. Harris, Thomson, 2007
6. Discrete Time Signal Processing – A.V.Oppenheim and R.W. Schaffer, PHI

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## (3D778) INDUSTRY ORIENTED MINI PROJECT

a	b	c	d	e	f	g	h	i	j	k	l
								x	x	x	x

**Pre-Requisites:** All Courses till this semester**Course Outcomes:**

- Students used the concepts learned in the courses, so far, in executing the modules of the projects.
- They also exhibited the interest in learning the modern tools and technologies through the bridge courses arranged in the college, beyond the curriculum, and hence developing.
- They also inculcated an enthusiasm to use the creative ideas to build the innovative projects which are meeting the current needs of the market and society as a whole.
- Through this course, communicative skills and team skills are largely improved.
- The students learnt the ability to work as an individual and in a team.

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 **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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## (3D779) PROJECT PHASE – I

a	b	c	d	e	f	g	h	i	j	k	l
								x	x	x	x

**Pre-Requisites:** All Courses till this semester**Course Outcomes:**

- Students identify a topic from the current technical topics of their choice in the computer science domain and the allied fields, after surveying in the internet resources, journals and technical magazines in the library.
- Student learnt to arrange the contents of the presentation and scope of the topic, in an effective manner.
- Each student then presents the technical topic they chose in front of the panel and the fellow students, using the oratory skills.
- Students also face the questions posed by the panel and the students and answer them.

A pre-project 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 final year second semester.

Preliminary Report on progress of the 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

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**(3DC72) EMBEDDED SYSTEMS LAB**

a	b	c	d	e	f	g	h	i	j	k	l
		x		x					x		

**CYCLE – I : Experiments based on 8051 & ARM Microcontrollers**

1. Serial Data Transmission using 8051 & ARM microcontroller in different modes.
2. Keyboard LCD interface to 8051&ARM.
3. ADC, DAC interface based experiment utilizing internal ADC & DAC for ARM Microcontroller.
4. DC Motor Speed Control using PWM using ARM 7.

**CYCLE – II : Experiments using I<sup>2</sup>C, SPI serial communication using ARM Microcontroller**

5. Program to demonstrate I<sup>2</sup>C interface serial EEPROM.
6. Program to demonstrate SPI interface for SD-MMC card interface.
7. Porting of RTOS on ARM Microcontroller.
8. Experiments based on RTOS: sending a message to PC through serial port by 3 different tasks on priority bases.
9. Case study on Embedded Linux/Vx-Works/ μCOS- II
10. Case study on Cross Compiler/Assembler tools.

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**(3DC73) VLSI LAB**

a	b	c	d	e	f	g	h	i	j	k	l
x	x		x	x				x	x		x

**Lab Objective:**

- To familiarize students with VLSI CAD Tools (Xilinx, Microwind and NG SPICE).
- To make students understand and implement digital logic gates and circuits using SPICE and Verilog HDL.
- To introduce the student to physical design by implementing layouts using Microwind.
- To make students implement combinatorial and sequential designs on FPGA boards (SPARTAN 3) using Xilinx tools.

**Tools to be used:** Xilinx, MicorWind, SPICE

**Part-A**

1. Perform I-V characteristic analysis of transistors using SPICE.
2. Perform inverter voltage transfer characteristics and logic gate delay analysis using SPICE.
3. Design combinatorial circuit design using subckts in SPICE ( NAND/NOR based)

**Part-B**

1. Introduction to Microwind and Analysis of CMOS 0.25 micron Technology MOSFETs
2. CMOS 0.25 micron Technology Inverter Characteristics and layout in Microwind
3. Layout of Basic Gates and a Complex Gate using CMOS 0.25 and layout in Microwind
4. Layout of Multiplexers

**Part-C**

1. Implement combinatorial digital blocks (Adders - Half, Full, Binary & its applications) using FPGA.
2. Implement Sequential digital blocks (Counter, Shifters and Sequence Detectors) using FPGA
3. Implement Complex memory modules - RAM, FIFO, LIFO

**Part-D Lab Project –**

1. FPGA based traffic light controller using Verilog HDL
2. FPGA based Beverage Vending Machine
3. FPGA based UART serial communication interface
4. Implement 8-bit 3-stage pipeline processor
5. Using SPICE Implement 6T SRAM memory with read and write logic

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## (3D793) TECHNICAL PAPER WRITING AND SEMINAR III

a	b	c	d	e	f	g	h	i	j	k	l
x								x	x		x

**Pre-Requisites:** All Courses till this semester**Course Outcomes:**

- Students identify a topic from the current technical topics of their choice in the electronics & computer engineering domain and the allied fields, after surveying in the internet resources, journals and technical magazines in the library.
- Student learnt to arrange the contents of the presentation and scope of the topic, in an effective manner.
- Each student then presents the technical topic they chose in front of the panel and the fellow students, using the oratory skills.
- Students also face the questions posed by the panel and the students and answer them.

There shall be a Technical Paper writing and seminar evaluated for 25 marks in every semester from III-year I-semester. The evaluation is purely internal and will be conducted as follows:

Paper writing	: 05 marks
Final report	: 05 marks
Presentation before a departmental committee consisting of Head, a Senior Faculty and Supervisor	: 15 marks

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3	1	-	3

**PROFESSIONAL ELECTIVE – II**  
**(3CC14) ANTENNAS AND WAVE PROPAGATION**

a	b	c	d	e	f	g	h	i	j	k	l
x	x		x								

After studying this course, the students will be able to

1. Analyze the fundamentals of antennas
2. Analyze and design the linear wire antennas and antenna arrays.
3. Analyze and design the different reflector antennas.
4. Analyze and design the wire antennas and measure the different antenna parameters.
5. Analyze surface wave and Tropospheric wave propagation
6. Analyze ionospheric wave propagation

**UNIT I****FUNDAMENTAL PARAMETERS OF ANTENNAS**

Review of Electromagnetic Theory: Vector Potential, Solution of Wave Equation, Retarded Case, Hertzian Dipole. Antenna Characteristics: Radiation Pattern, Beam Solid Angle, Directivity, Gain, Input Impedance, Polarization, Bandwidth, Reciprocity, Equivalence of Radiation Patterns, Equivalence of Impedances, Effective Aperture, Vector Effective Length, Antenna

**UNIT-II****LINEAR WIRE ANTENNAS AND ARRAYS**

Wire Antennas: Short Dipole, Radiation Resistance and Directivity, Half Wave Dipole, Monopole, Small Loop Antennas. Antenna Arrays: Linear Array and Pattern Multiplication, Two-Element Array, Uniform Array, BSA and EFA, EFA With increased Directivity. BSA with Non- uniform Amplitude Distributions and Binomial Arrays.

**UNIT-III****APERTURE AND REFLECTOR ANTENNAS**

Magnetic Current and its Fields, Uniqueness Theorem, Field Equivalence Principle, Duality Principle, Method Of Images, Pattern Properties, Slot Antenna, Horn Antenna, Pyramidal Horn Antenna, Reflector Antenna-Flat Reflector, Corner Reflector, Common Curved Reflector Shapes, Lens Antenna.

**Applications: Design of parabolic reflector for DTH.**

**UNIT-IV**

Long Wire, V and Rhombic Antenna, Yagi-Uda Antenna, Turnstile Antenna, Helical Antenna- Axial Mode Helix, Normal Mode Helix, Biconical Antenna, Log Periodic Dipole Array, Spiral Antenna, Microstrip Patch Antennas. Antenna Measurements: Radiation Pattern Measurement, Gain and Directivity.

**Applications: Design of a 3-element Yagi guda Antenna for television reception for given specifications**

**UNIT-V**

Surface Wave Propagation-Modes of Wave Propagation-Surface Wave Propagation and Surface Wave Tilt-Plane Earth Reflection, Reflection and Refraction of Waves-Field Strength due to Ground Wave-Multi-Hop Transmission. Tropospheric and Space Wave Propagation

**UNIT-VI**

Ionospheric Propagation: Structure of Ionosphere-Measures of Ionosphere Propagation-Critical Frequency-Angle of Incidence-MUF And LUF ,Optimum Working Frequency-Skip Distance, Virtual Height , Refractive Index of The Ionosphere ,Effect of the Earth Magnetic Field and Fading

**TEXT BOOKS:**

1. Antennas for All Applications – John D. Kraus and Ronald J. Marhefka, TMHI, 3rd Edn., 2003.
2. Electromagnetic Waves and Radiating Systems – E.C. Jordan and K.G. Balmain, PHI, 2nd ed., 2000.

**REFERENCES:**

1. Antenna Theory - C.A. Balanis, John Wiley & Sons, 2nd ed., 2001.
2. Antennas and Wave Propagation – K.D. Prasad, Satya Prakashan, Tech India Publications, New Delhi, 2001.
3. Transmission and Propagation – E.V.D. Glazier and H.R.L. Lamont, The Services Text Book of Radio, vol. 5, Standard Publishers Distributors, Delhi.
4. Electronic and Radio Engineering – F.E. Terman, McGraw-Hill, 4th edition, 1955.
5. Antennas – John D. Kraus, McGraw-Hill, SECOND EDITION, 1988.



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**PROFESSIONAL ELECTIVE – II**  
**(3EC13) SOFTWARE ARCHITECTURE AND DESIGN PATTERN**

a	b	c	d	e	f	g	h	i	j	k	l
	X		X					X	X		

**UNIT I***Envisioning Architecture*

The Architecture Business Cycle, What is Software Architecture? , Architectural patterns, reference models, reference architectures, architecture structures and views.

**UNIT II***Creating an Architecture*

Quality Attributes, Architectural styles and patterns, Designing the Architecture, Documenting the architecture, Reconstructing Software Architecture.

**UNIT III***Analyzing Software Architecture*

Architecture evaluation, Architecture design decision making, SAAM, ATAM, CBAM.

*Moving from Architecture to Systems*

Software Product Lines, Building systems from off the shelf components, Software architecture in future.

**UNIT IV***Design Patterns*

What is pattern? Pattern Description, Organizing catalogs, Role in solving problems, Selection and usage.

**UNIT V**

*Creational patterns:* Abstract factory, Builder, Factory method, prototype, singleton.

*Structural patterns:* Adapter, Bridge, Composite, Decorator, Façade, Flyweight, Proxy.

**UNIT VI**

*Behavioural patterns:* Chain of responsibility, Command, Interpreter, Iterator, Mediator, Memento, Observer, State, Strategy, Template method, Visitor.

*Case Studies*

The World Wide Web - a case study in interoperability, Flight Simulation- A Case Study in an Architecture for Integrability.

**TEXT BOOKS**

- 1 Software Architecture in Practice, 2nd Edition by Len Bass, Paul Clements, Rick Kazman, published by Pearson Edition
2. Design Patterns, by Erich Gamma, Pearson Education

**REFERENCES**

1. Beyond Software Architecture, Luke Hohmann, Addison Wesley, 2003.
2. Software Architecture, David M Dikel, David Kane and James R Wilson, Prentice Hall PTR, 2001.
3. Pattern Oriented Software Architecture, F Buschmann&others, John Wiley&Sons.
4. Head First Design patterns, Erac Freeman & Elisabeth Freeman, O'REILLY, 2007.
5. Design pattern in java, Steven John Metsker&William C. Wake, Pearson Education, 2006.
6. Design patterns in C#, Steven John Metsker, Pearson Education, 2004.
7. J2EE Patters, Deepak Alur, John Crupi&Dan Malks, Pearson Education, 2003.
8. Software Design, David Budgen, Second edition, Pearson Education, 2003.

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**PROFESSIONAL ELECTIVE – II**  
**(3FC05) DATAWAREHOUSING AND DATA MINING**

a	b	c	d	e	f	g	h	i	j	k	l
	X	X	X					X	X		

**UNIT – I**

**Introduction :** Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Major issues in Data Mining

**Data Preprocessing :** Needs Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation. Data Mining Primitives, Data Mining Query Languages, Architectures of Data Mining Systems

**UNIT – II**

Data Warehouse and OLAP Technology for Data Mining Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation

**Data Cube Computation:** Efficient Methods for simple Data Cube Computation (Full Cube, Iceberg Cube, Closed Cube and Shell Cube), Discovery Driven exploration of data cubes

**UNIT – III**

**Concepts Description: Characterization and Comparison:** Data Generalization and Summarization-Based Characterization, Analytical Characterization: Analysis of Attribute Relevance, Mining Class Comparisons: Discriminating between Different Classes, Mining Descriptive Statistical Measures in Large Databases.

**UNIT – IV**

**Mining Association Rules in Large Databases :** Association Rule Mining, Mining Single-Dimensional Boolean Association Rules from Transactional Databases, Mining Multilevel Association Rules from Transaction Databases, Mining Multidimensional Association Rules from Relational Databases and Data Warehouses, From Association Mining to Correlation Analysis, Constraint-Based Association Mining.

**UNIT – V**

**Classification and Prediction:** Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Classification by Backpropagation, Classification Based on Concepts from Association Rule Mining, Other Classification Methods, Prediction, Classifier Accuracy.

**UNIT - VI**

**Cluster Analysis Introduction :** Introduction to machine learning, Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Density-Based Methods, Grid-Based Methods, Model-Based Clustering Methods, Outlier Analysis.

**TEXT BOOK :**

1. Data Mining – Concepts and Techniques - JIAWEI HAN & MICHELINE KAMBER Harcourt India.
2. Introduction to Data Mining - First Edition, by Pang-Ning Tan, Michael Steinbach and Vipin Kumar, ISBN-13: 978-0321321367

**REFERENCES :**

1. Data Mining Introductory and advanced topics –MARGARET H DUNHAM, PEARSON EDUCATION
2. Data Mining Techniques – ARUN K PUJARI, University Press.
3. Data Warehousing in the Real World – SAM ANAHORY & DENNIS MURRAY. Pearson Edn Asia.
4. Data Warehousing Fundamentals – PAULRAJ PONNAIAH WILEY STUDENT EDITION.
5. The Data Warehouse Life cycle Tool kit – RALPH KIMBALL WILEY STUDENT EDITION

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## (3EC08) COMPILER DESIGN

a	b	c	d	e	f	g	h	i	j	K	l	m
	X		X									

**UNIT I**

Overview of compiler – Environment, pass, phase, phases of compiler, regular expression, Lexical Analyzer, LEX tool, Bootstrapping.

**Objective:** On the completion of the unit, a student should be able to know about i) phases of compiler ii) regular expression, examples iii) tools like LEX.

**UNIT II**

Top Down Parsing: Context free grammar, Top down parsing technique, LMD, RMD, Recursive decent parsing with back tracking, Ambiguous grammar, Elimination of left recursion, Left factoring, unambiguous grammar, Predictive parsing, LL(1).

**Objective:** Students know about i) types of grammars and their concepts, examples ii) different Top down parsing techniques, examples

**UNIT III**

Bottom up parsing: shift reduce parser SLR, CLR, LALR, operator precedence parser, LR (O), LR(1), LR(K) grammar, YACC tool.

**Objective:** Students will study about i) different bottom up parsing technique with examples ii) YACC tool

**UNIT IV**

Semantic Analysis: Syntax directed translation, S- Attributed, L Attributed definition, Type checker, equivalence of type expressions, type conversions, overloading of functions & operators.

Intermediate code generation: 3-address code form, DAG , polish notation.

**Objective:** Students will learn about i) semantic analyzer ii) translations iii) intermediate code generation and its various forms with examples

**UNIT V**

Runtime environment: Symbol table format, organization of block structure languages, hashing, tree structures representation of scope information Block structures and non-block structures storage allocation, static, runtime stack and heap storage allocations, storage allocation for arrays, strings and records.

Code optimization: Optimization, scope of optimization, common sub expression elimination, frequency reduction, strength reduction, loop optimization, peep-hole optimization, copy propagation.

**Objective :** On the completion of the unit, student will understand about i) runtime environment and its concepts ii) different types of code optimization techniques with examples

## **UNIT VI**

Data flow Analysis: Data flow graphs, data flow graph Analysis, live variable analysis.

Code generation: Machine dependent code generation, object code forms, register allocation, generic code generation algorithm, DAG for register allocation.

**Case studies:** JIT compiler.

**Objective :** Student will study about i) data flow analysis ii) code generation iii) different object forms

### **Text Book:**

1. Compilers Principles, Techniques and Tools Aho, Ullman, Ravisethi, Pearson Education.

### **Reference Books:**

1. Modern Compiler Construction in C , Andrew W.Appel Cambridge University Press.
2. Compiler Construction, LOUDEN, Thomson.

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## (3D894) TECHNICAL PAPER WRITING AND SEMINAR - IV

a	b	c	d	e	f	g	h	i	j	k	l
x								x	x		x

**Pre-Requisites:** All Courses till this semester**Course Outcomes:**

- Students identify a topic from the current technical topics of their choice in the electronics & computer engineering domain and the allied fields, after surveying in the internet resources, journals and technical magazines in the library.
- Student learnt to arrange the contents of the presentation and scope of the topic, in an effective manner.
- Each student then presents the technical topic they chose in front of the panel and the fellow students, using the oratory skills.
- Students also face the questions posed by the panel and the students and answer them.

There shall be a Technical Paper writing and seminar evaluated for 25 marks in every semester from III-year I-semester. The evaluation is purely internal and will be conducted as follows:

Paper writing	: 05 marks
Final report	: 05 marks
Presentation before a departmental committee consisting of Head, a Senior Faculty and Supervisor	: 15 marks

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## (3D881) COMPREHENSIVE VIVA-VOCE

a	b	c	d	e	f	g	h	i	j	k	l
x								x	x		x

**Pre-Requisites:** All Courses till this semester**Course Outcomes:**

- Students are assessed in the courses they have undergone till the completion of that academic year.
- They are asked to comprehend the concepts in the core subjects and the elective subjects, to make them ready to face technical interviews which improve their employability skills.

There shall be a Comprehensive Viva-Voce in every 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 till II-semester. 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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L	T	P/D	C
-	-	15	10

**(3D880) PROJECT PHASE - II**

a	b	c	d	e	f	g	h	i	j	k	l
								x	x	x	x

**Pre-Requisites:** All Courses till this semester

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 will be given by Internal Guide himself.

**Division of Marks for External Evaluation – 150 Marks****Pattern of External Evaluation for Project**

1. Final Project Report : 30 Marks
2. Presentation : 20 Marks
3. Demonstration / Defense of Project : 100 Marks



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4	-	-	4

**PROFESSIONAL ELECTIVE – III**  
**(3C827) WIRELESS COMMUNICATION NETWORKs**

a	b	c	d	e	f	g	h	i	j	k	l
x	x		x								

**UNIT-I: Introduction to Wireless Communication systems:** Evolution of mobile radio communications, Examples of wireless communication systems, Paging systems, cordless telephone systems, comparison of various wireless systems.

**Modern wireless communication systems:** second generation cellular networks, Third generation wireless networks, wireless in local loop, Wireless LAN, Bluetooth and PAN.

**UNIT- II: Multiple Access Techniques for Wireless communication:** Introduction to multiple access, FDMA, TDMA, Spread spectrum multiple access, Space division multiple access, Packet Radio, Capacity of a cellular systems.

**UNIT-III: Wireless Networking:** Difference between wireless and fixed telephone networks, Development of wireless networks, Fixed network transmission hierarchy, Traffic routing in wireless networks, Wireless data services, Common channel signaling.

**UNIT- IV: Mobile IP And Wireless Access Protocol:** Mobile IP Operation of mobile IP, Co-located address, Registration, Tunneling, WAP Architecture, overview, WML scripts, WAP service, WAP session protocol, wireless transaction, Wireless datagram protocol

**UNIT- V: Wireless LAN:** Historical overview of the LAN industry, Evolution of the WLAN industry, Wireless home networking, IEEE 802.11, The PHY layer, MAC Layer, Wireless ATM, HYPERLAN, HYPERLAN-2, Introduction to OFDM, Blue tooth protocol Architecture.

**UNIT- VI: Wireless WAN:** Mechanism to support a mobile environment, Communication in the infrastructure. IS-95 CDMA forward channel, IS-95 CDMA reverse channel, Packet and frame formats in IS-95, IMT – 2000, Forward channels in W-CDMA and CDMA-2000, Reverse channels in W-CDMA and CDMA-2000, GPRS and higher data rates, Short messaging service in GPRS mobile application protocols.

**Text Books:**

1. Theodore S. Rappaport, “*Wireless Communications and applications*”, Pearson Education -2003.
2. Kaveh Pahlavan, Prashant Krishna Murthy, “*Principles of Wireless networks*”, Pearson Education, 2002.

**Reference Books:**

1. P.Nicopolitidis, M.S.Obaidat, G.I.Papadimitria, A.S. Pomportsis, “*Wireless Networks*”, John wily & sons, 2003.
2. Dr. Sunil kumar, S.manvi, M.S.Kakkasageri, ”*Wireless and Mobile Networks, Concepts and Protocols*”, Wiley India, 2010.
3. Jon W.Mark and W.Zhqung , “ *Wireless Communication and Networking* “, PHI, 2005.

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**PROFESSIONAL ELECTIVE – III**  
**(3FC11) CRYPTOGRAPHY AND NETWORK SECURITY**

a	b	c	d	e	f	g	h	i	j	k	l
x	x		x								

**UNIT - I**

Security Attacks (Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability) and Mechanisms, A model for Internetwork security, Internet Standards and RFCs.

**UNIT - II**

Conventional Encryption Principles, Conventional encryption algorithms: DES, TDES, AES, cipher block modes of operation, location of encryption devices, key distribution, Approaches of Message Authentication, Secure Hash Functions: SHA1 and HMAC.

**UNIT – III**

Public key cryptography principles, public key cryptography algorithms: RSA, DIFFIE HELL MAN, digital signatures, digital Certificates, Certificate Authority and key management Kerberos, X.509 Directory Authentication Service.

Email privacy: Pretty Good Privacy (PGP) and S/MIME.

**UNIT - IV**

IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management.

**UNIT – V**

Web Security Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET). Intruders, Viruses and related threats.

**UNIT - VI**

Firewall Design principles, Trusted Systems. Intrusion Detection Systems.

**TEXT BOOKS :**

1. Network Security Essentials (Applications and Standards) by William Stallings Pearson Education.
2. Hack Proofing your network by Ryan Russell, Dan Kaminsky, Rain Forest Puppy, Joe Grand, David Ahmad, Hal Flynn Ido Dubrawsky, Steve W.Manzuik and Ryan Permech, wiley Dreamtech

**REFERENCES :**

1. Fundamentals of Network Security by Eric Maiwald (Dreamtech press)
2. Network Security - Private Communication in a Public World by Charlie Kaufman, Radia Perlman and Mike Speciner, Pearson/PHI.
3. Cryptography and network Security, Third edition, Stallings, PHI/Pearson
4. Principles of Information Security, Whitman, Thomson.
5. Network Security: The complete reference, Robert Bragg, Mark Rhodes, TMH
6. Introduction to Cryptography, Buchmann, Springer.

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L	T	P/D	C
4	-	-	4

**PROFESSIONAL ELECTIVE – III**  
(3EC12) SOFTWARE PROJECT MANAGEMENT

a	b	c	d	e	f	g	h	i	j	k	l
	X		X				X	X			

**UNIT I**

**Conventional Software Management:** The waterfall model, conventional software Management performance.

**Evolution of Software Economics:** Software Economics, pragmatic software cost estimation.

**UNIT II**

**Improving Software Economics:** Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections.

**The old way and the new:** The principles of conventional software Engineering, principles of modern software management, transitioning to an iterative process.

**UNIT III**

**Life cycle phases:** Engineering and production stages, inception, Elaboration, construction, transition phases.

**Artifacts of the process:** The artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts.

**UNIT IV**

**Model based software architectures:** A Management perspective and technical perspective.

**Work Flows of the process:** Software process workflows, Iteration workflows.

**UNIT V**

**Checkpoints of the process:** Major mile stones, Minor Milestones, Periodic status assessments.

**Iterative Process Planning:** Work breakdown structures, planning guidelines, cost and schedule estimating, Iteration planning process, Pragmatic planning.

**Project Organizations and Responsibilities:** Line-of-Business Organizations, Project Organizations, evolution of Organizations.

**UNIT VI**

**Process Automation:** Automation Building blocks, The Project Environment.

**Project Control and Process instrumentation:** The seven core Metrics, Management indicators, quality indicators, life cycle expectations,

**Future Software Project Management:** Modern Project Profiles, Next generation Software economics, modern process transitions.

**TEXT BOOKS**

1. Software Project Management, Walker Royce: Pearson Education, 2005.

**REFERENCES**

1. Software Project Management, Bob Hughes and Mike Cotterell: Tata McGraw-Hill Edition.
2. Software Project Management, Joel Henry, Pearson Education.
3. Software Project Management in practice, Pankaj Jalote, Pearson Education.2005

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**PROFESSIONAL ELECTIVE – III**  
(3FC15) MULTIMEDIA AND IMAGE PROCESSING

a	b	c	d	e	f	g	h	i	j	k	l
	X	X	X								

**UNIT I**

**Fundamental concepts in Text and Image:** Multimedia and hypermedia, World Wide Web, overview of multimedia software tools. Graphics and image data representation graphics/image data types, file formats, Color in image and video: color science, color models in images, color models in video.

**UNIT II**

**Fundamental concepts in video and digital audio:** Types of video signals, analog video, digital video, digitization of sound, MIDI, quantization and transmission of audio.

**UNIT III**

**DIP basics:** Examples of fields that use digital image processing, fundamental steps in digital image processing, components of image processing system, A simple image formation model.

**UNIT IV**

**Image enhancement:** Basic gray-level transformation, histogram processing, enhancement using arithmetic and logic operators, basic spatial filtering, smoothing and sharpening spatial filters  
**Image restoration:** A model of the image degradation/restoration process, noise models, restoration in the presence of noise—only spatial filtering.

**UNIT V**

**Data Compression:** Fundamentals, image and video compression models, error-free compression, lossy/predictive coding, image compression standards

**UNIT VI****Segmentation and Recognition:**

Detection of discontinuous, edge linking and boundary detection, thresholding, region-based segmentation, Patterns and patterns classes, recognition based on decision-theoretic methods.

**TEXT BOOKS:**

1. Fundamentals of Multimedia by Ze-Nian Li and Mark S. Drew PHI/Pearson Education.
2. Digital Image Processing, Rafael C. Gonzalez, Richard E. Woods, Second Edition, Pearson Education/PHI.

**REFERENCE BOOKS:**

1. Digital Multimedia, Nigel Chapman and Jenny Chapman, Wiley-Dreamtech
2. Multimedia and communications Technology, Steve Heath, Elsevier(Focal Press).
4. Image Processing, Analysis, and Machine Vision, Milan Sonka, Vaclav Hlavac and Roger Boyle, Second Edition, Thomson Learning
5. Digital Image Processing, William K. Pratt, Wiley Third Edition
6. Digital Image Processing, Jähne, Springer.