

**KONGU ENGINEERING COLLEGE**  
**PERUNDURAI ERODE – 638 052**  
**(Autonomous)**

**VISION**

To be a centre of excellence for development and dissemination of knowledge in Applied Sciences, Technology, Engineering and Management for the Nation and beyond.

**MISSION**

We are committed to value based Education, Research and Consultancy in Engineering and Management and to bring out technically competent, ethically strong and quality professionals to keep our Nation ahead in the competitive knowledge intensive world.

**QUALITY POLICY**

We are committed to

- Providing value based quality education for the development of students as competent and responsible citizens.
- Contributing to the nation and beyond through research and development
- Continuously improving our services

**DEPARTMENT OF INFORMATION TECHNOLOGY**

**VISION**

To be a centre of excellence for development and dissemination of knowledge in Information Technology for the Nation and beyond.

**MISSION**

Department of Information Technology is committed to:

- MS1: To transform the students into innovative, competent and high quality IT professionals to meet the growing global challenges.
- MS2: To impart value-based IT education to the students and enrich their knowledge.
- MS3: To endeavour for continuous upgradation of technical expertise of students to cater to the needs of the society.
- MS4: To achieve an effective interaction with industry for mutual benefits.

**2011 REGULATIONS**

**PROGRAM EDUCATIONAL OBJECTIVES (PEOs)**

Graduates of Information Technology will

- PEO1: Excel in industry and higher education by applying fundamental knowledge in engineering principles.
- PEO2: Analyze, design and implement Information Technology based solutions to meet the real world problems.
- PEO3: Exhibit Soft skills, Professional and Ethical values and thrust for continuous learning for a successful professional career.

**MAPPING OF MISSION STATEMENTS (MS) WITH PEOs**

<b>MS\PEO</b>	<b>PEO1</b>	<b>PEO2</b>	<b>PEO3</b>
<b>MS1</b>	3	3	2
<b>MS2</b>	2	2	3
<b>MS3</b>	2	2	3
<b>MS4</b>	3	2	3

1 – Slight, 2 – Moderate, 3 – Substantial

## PROGRAM OUTCOMES (POs)

Graduates of Information Technology will be able to

- a. An ability to apply knowledge of mathematics, science and engineering.
- b. An ability to design and conduct experiments, as well as to analyze and interpret data.
- c. An ability to design a system, or process to meet desired needs within realistic constraints.
- d. An ability to function in multi disciplinary teams.
- e. An ability to identify, formulate and solve engineering problems.
- f. An understanding of professional and ethical responsibility.
- g. An ability to communicate effectively.
- h. An ability to understand the impact of engineering solutions in a global, economic, environmental and societal context.
- i. A recognition of the need for and ability to engage in life-long learning.
- j. A knowledge of contemporary issues
- k. An ability to use the techniques, skills and modern engineering tools necessary for engineering practice
- l. An ability to understand, design and develop Information Technology based products.
- m. An aptitude to take up applied research and to become entrepreneurs in Information Technology by combining the skills of project management and finance.

## MAPPING OF PEOs WITH POs

PEO\PO	a	b	c	d	e	f	g	h	i	j	k	l	m
<b>PEO1</b>	3	-	-	1	3	-	-	2	3	-	-	-	-
<b>PEO2</b>	1	3	3	3	3	-	-	2	-	3	3	3	-
<b>PEO3</b>	-	-	3	-	-	3	2	-	1	3	-	-	3

1 – Slight, 2 – Moderate, 3 – Substantial

## CURRICULUM BREAKDOWN STRUCTURE UNDER REGULATION 2011

Curriculum Breakdown Structure(CBS)	Curriculum Content (% of total number of credits of the program)	Total number of contact hours	Total number of credits
Basic Sciences(BS)	20.99	630	38
Engineering Sciences(ES)	13.81	495	25
Humanities and Social Sciences(HS)	8.84	270	16
Program Core(PC)	44.75	1605	81
Program Electives(PE)	3.31	90	6
Open Electives(OE)	3.31	90	6
Project(s)/Internships(PR)	4.97	270	9
<b>Total</b>			<b>181</b>

**B.Tech. DEGREE IN INFORMATION TECHNOLOGY**

**CURRICULUM**

(For the candidates admitted from academic year 2011-12 onwards)

**SEMESTER – I**

Course Code	Course Title	Hours / Week			Credit	Maximum Marks			CBS
		L	T	P		CA	ESE	Total	
	<b>THEORY</b>								
11EL101	Technical English	3	0	0	3	50	50	100	HS
11MA101	Engineering Mathematics-I	3	1	0	4	50	50	100	BS
11PH101	Applied Physics	3	0	0	3	50	50	100	BS
11CY101	Applied Chemistry	3	0	0	3	50	50	100	BS
11ME101	Basics of Civil and Mechanical Engineering	3	0	0	3	50	50	100	PC
11ME102	Engineering Drawing	2	0	3	3	50	50	100	ES
	<b>PRACTICAL</b>								
11PH102	Physical Sciences Laboratory-I	0	0	3	1	50	50	100	BS
11ME103	Engineering Practices Laboratory	0	0	3	1	50	50	100	ES
<b>Total</b>					<b>21</b>				

CA- Continuous Assessment, ESE- End Semester Examination

CBS – Curriculum Breakdown Structure

**B.Tech. DEGREE IN INFORMATION TECHNOLOGY**

**CURRICULUM**

(For the candidates admitted from academic year 2011-12 onwards)

**SEMESTER – II**

Course Code	Course Title	Hours / Week			Credit	Maximum Marks			CBS
		L	T	P		CA	ESE	Total	
	<b>THEORY</b>								
11EL201	Communication Skills	3	0	0	3	50	50	100	HS
11MA201	Engineering Mathematics-II	3	1	0	4	50	50	100	BS
11PH201	Materials Science	3	0	0	3	50	50	100	BS
11CY201	Environmental Science	3	0	0	3	50	50	100	BS
11CS101	Problem Solving and Programming	3	0	0	3	50	50	100	ES
11EE101	Basics of Electrical and Electronics Engineering	3	0	0	3	50	50	100	ES
	<b>PRACTICAL</b>								
11PH202	Physical Sciences Laboratory-II	0	0	3	1	50	50	100	BS
11CS102	Programming Laboratory	0	0	3	1	50	50	100	ES
11EE203	Electrical and Electronics Engineering Laboratory	0	0	3	1	50	50	100	ES
<b>Total</b>					<b>22</b>				

CA- Continuous Assessment, ESE- End Semester Examination

CBS – Curriculum Breakdown Structure

**B. Tech. DEGREE IN INFORMATION TECHNOLOGY**

**CURRICULUM**

(For the candidates admitted from academic year 2011 – 12 onwards)

**SEMESTER – III**

Course Code	Course Title	Hours / Week			Credit	Maximum Marks			CBS
		L	T	P		CA	ESE	Total	
	<b>THEORY</b>								
11MA301	Engineering Mathematics - III	3	1	0	4	50	50	100	BS
11IT301	Data Structures	3	0	0	3	50	50	100	PC
11EC301	Digital Electronics	3	1	0	4	50	50	100	PC
11CS302	Object Oriented Programming with C++	3	0	0	3	50	50	100	PC
11CS303	Computer Organization	3	0	0	3	50	50	100	PC
11EC306	Basics of Signals and Systems	3	1	0	4	50	50	100	ES
	<b>PRACTICAL</b>								
11IT302	Data Structures Laboratory	0	0	3	1	50	50	100	PC
11EC304	Digital Electronics Laboratory	0	0	3	1	50	50	100	PC
11IT303	C ++ Programming Laboratory	0	0	3	1	50	50	100	PC
<b>Total</b>					<b>24</b>				

CA - Continuous Assessment, ESE - End Semester Examination

CBS – Curriculum Breakdown Structure

**B. Tech. DEGREE IN INFORMATION TECHNOLOGY**

**CURRICULUM**

(For the candidates admitted from academic year 2011 – 12 onwards)

**SEMESTER – IV**

Course Code	Course Title	Hours / Week			Credit	Maximum Marks			CBS
		L	T	P		CA	ESE	Total	
	<b>THEORY</b>								
11MA402	Probability and Queuing Theory	3	1	0	4	50	50	100	BS
11IT401	Java and Design Patterns	3	0	0	3	50	50	100	PC
11CS401	Database Management Systems	3	0	0	3	50	50	100	PC
11CS402	Operating Systems	3	0	0	3	50	50	100	PC
11IT402	Design and Analysis of Algorithms	3	1	0	4	50	50	100	PC
11EC407	Analog and Digital Communication	3	1	0	4	50	50	100	ES
	<b>PRACTICAL</b>								
11CS404	Database Management Systems Laboratory	0	0	3	1	50	50	100	PC
11CS406	Operating Systems Laboratory	0	0	3	1	50	50	100	PC
11IT403	Java and Design Patterns Laboratory	0	0	3	1	50	50	100	PC
<b>Total</b>					<b>24</b>				

CA - Continuous Assessment, ESE - End Semester Examination

CBS – Curriculum Breakdown Structure

**B. Tech. DEGREE IN INFORMATION TECHNOLOGY**

**CURRICULUM**

(For the candidates admitted from academic year 2011 – 12 onwards)

**SEMESTER – V**

Course Code	Course Title	Hours / Week			Credit	Maximum Marks			CBS
		L	T	P		CA	ESE	Total	
	<b>THEORY</b>								
11MA501	Discrete Mathematics	3	1	0	4	50	50	100	BS
11IT501	Computer Graphics and Multimedia	3	0	0	3	50	50	100	PC
11IT502	Computer Communication Networks	3	0	0	3	50	50	100	PC
11CS304	Software Engineering	3	0	0	3	50	50	100	PC
11EC502	Digital Signal Processing	3	1	0	4	50	50	100	ES
11EC509	Microprocessors and Interfacing	3	1	0	4	50	50	100	PC
	<b>PRACTICAL</b>								
11EC510	Microprocessors and Interfacing Laboratory	0	0	3	1	50	50	100	PC
11EC511	Communication and Digital Signal Processing Laboratory	0	0	3	1	50	50	100	ES
11EL202	Communication Skills Laboratory	0	0	3	1	50	50	100	HS
<b>Total</b>					<b>24</b>				

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CBS – Curriculum Breakdown Structure

**KONGU ENGINEERING COLLEGE, PERUNDURAI, ERODE – 638 052**  
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**B. Tech. DEGREE IN INFORMATION TECHNOLOGY**

**CURRICULUM**

(For the candidates admitted from academic year 2011 – 12 onwards)

**SEMESTER – VI**

Course Code	Course Title	Hours / Week			Credit	Maximum Marks			CBS
		L	T	P		CA	ESE	Total	
	<b>THEORY</b>								
11MA401	Numerical Methods	3	1	0	4	50	50	100	BS
11GE601	Economics and Management for Engineers	3	0	0	3	50	50	100	HS
11IT601	Network Programming and Management	3	0	0	3	50	50	100	PC
11IT602	Distributed Systems	3	0	0	3	50	50	100	PC
11IT603	Object Oriented System Development	3	0	0	3	50	50	100	PC
	Elective - I	3	0	0	3	50	50	100	PE
	<b>PRACTICAL</b>								
11IT604	Network Laboratory	0	0	3	1	50	50	100	PC
11IT605	Distributed Systems Laboratory	0	0	3	1	50	50	100	PC
11CS705	Case Tools Laboratory	0	0	3	1	50	50	100	PC
<b>Total</b>					<b>22</b>				

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**B. Tech. DEGREE IN INFORMATION TECHNOLOGY**

**CURRICULUM**

(For the candidates admitted from academic year 2011 – 12 onwards)

**SEMESTER – VII**

Course Code	Course Title	Hours / Week			Credit	Maximum Marks			CBS
		L	T	P		CA	ESE	Total	
	<b>THEORY</b>								
11GE701	Total Quality Management	3	0	0	3	50	50	100	HS
11IT701	Network Security	3	1	0	4	50	50	100	PC
11IT702	Web Technology	3	0	0	3	50	50	100	PC
11IT703	Wireless Communication and Networks	3	1	0	4	50	50	100	PC
11EC607	Embedded Systems	3	0	0	3	50	50	100	PC
	Elective – II	3	0	0	3	50	50	100	PE
	<b>PRACTICAL</b>								
11IT704	Web Technology Laboratory	0	0	3	1	50	50	100	PC
11IT705	Network Security Laboratory	0	0	3	1	50	50	100	PC
11EC707	Embedded Systems Laboratory	0	0	3	1	50	50	100	PC
<b>Total</b>					<b>23</b>				

CA - Continuous Assessment, ESE - End Semester Examination

CBS – Curriculum Breakdown Structure

**B. Tech. DEGREE IN INFORMATION TECHNOLOGY**

**CURRICULUM**

(For the candidates admitted from academic year 2011 – 12 onwards)

**SEMESTER – VIII**

Course Code	Course Title	Hours / Week			Credit	Maximum Marks			CBS
		L	T	P		CA	ESE	Total	
	<b>THEORY</b>								
11GE801	Professional Ethics and Human Values	3	0	0	3	50	50	100	HS
11CS704	Service Oriented Architecture	3	0	0	3	50	50	100	PC
	Elective – III	3	0	0	3	50	50	100	PE
	Elective – IV	3	0	0	3	50	50	100	PE
	<b>PRACTICAL</b>								
11IT801	Project Work	0	0	18	9	100	100	200	PR
<b>Total</b>					<b>21</b>				

CA - Continuous Assessment, ESE - End Semester Examination

CBS – Curriculum Breakdown Structure

<b>LIST OF ELECTIVES</b>						
<b>Course Code</b>	<b>Course Title</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>CBS</b>
11CS011	Software Quality Assurance	3	0	0	3	PE
11CS013	Adhoc Networks	3	0	0	3	PE
11CS014	Software Testing	3	0	0	3	PE
11CS016	Grid Computing	3	0	0	3	PE
11CS801	Software Project Management	3	0	0	3	PE
11EC012	Soft Computing	3	0	0	3	PE
11EC017	Digital Image Processing	3	0	0	3	PE
11CS603	.Net Technologies	3	0	0	3	PE
11IT011	High Performance Networks	3	0	0	3	PE
11IT012	Information Coding Techniques	3	0	0	3	PE
11IT013	Java Technologies	3	0	0	3	PE
11IT014	Cloud Computing	3	0	0	3	PE
11IT015	Visualisation Techniques	3	0	0	3	PE
11IT016	System Software	3	0	0	3	PE
11IT017	Multi-Core Architecture and Programming	3	0	0	3	PE
11IT018	Compiler Design	3	0	0	3	PE
11IT019	Data Warehousing and Data mining	3	0	0	3	PE
11GE011	Entrepreneurship Development	3	0	0	3	PE
11IT020	Building Enterprise Applications	3	0	0	3	PE
11CS020	Business Intelligence and Its Application	3	0	0	3	PE

**11EL101 TECHNICAL ENGLISH**  
(Common to all Engineering and Technology branches)

**3    0    0    3**

**MODULE – I**

**17**

**Grammar and Vocabulary:** Word formation with prefixes and suffixes – Synonyms and Antonyms – Verb Patterns – Tenses (simple and compound tenses) - Simple, Compound and Complex Sentences - Voice – Use of Conditionals - Comparative Adjectives (affirmative and negative) – Expanding Nominal compounds - Articles - Use of Prepositions – Identifying Odd Words – Acronyms.

**MODULE – II**

**13**

**Listening:** Listening for General Content – Intensive Listening – Listening for Specific Information : Retrieval of Factual Information – Listening to Identify Topic, Context, Function, Speaker’s Opinion, Attitude, etc. – Global Understanding Skills and Ability to infer, extract gist and understand main ideas – Note-taking: Guided and unguided- Listening to fill up gapped texts.

**Writing:** Introduction to the Characteristics of Technical Style - Writing Definitions and Descriptions - Paragraph Writing (topic sentence and its role, unity, coherence and use of cohesive expressions) - Process Description(use of sequencing connectives)– Comparison and Contrast - Classifying the data - analysing / interpreting the data – Personal letter - Formal letter writing (Inviting Guest Speakers, letter to the editor, letter for seeking practical training, and letter for undertaking project works in industries) – editing (punctuation, spelling and grammar) – Recommendations & Suggestions.

**MODULE- III**

**15**

**Reading:** Exposure to different Reading Techniques - Reading for Gist and global meaning - Predicting the content - Skimming the text – Identifying the Topic Sentence and its role in each paragraph - Scanning - Inferring / identifying lexical and contextual meanings - Reading for structure and detail - Transfer of information / guided note-making - Understanding discourse coherence - Sequencing of sentences.

**Speaking:** Verbal and Non Verbal Communication - Pronunciation drills/ Tongue Twisters – Formal and Informal English - Oral practice – Developing Confidence - Introducing Oneself - Asking for or Eliciting Information - Describing Objects – Offering Suggestions and Recommendations – expressing opinions (agreement / disagreement).

**TOTAL : 45**

**TEXT BOOK**

1. “English for Engineers and Technologists”, Combined Edition, Volume. I & II, Orient Longman, Oxford University Press, New Delhi, 2006.

**REFERENCE BOOKS**

1. Aysha Viswamohan, “English for Technical Communication”, Tata McGraw-Hill, New Delhi, 2008.
2. Rizvi M Ashraf, "Effective Technical Communication", Fifth Edition, Tata McGraw- Hill, New Delhi, 2007.
3. Mark Ibbotson, “Cambridge English for Engineering”, Cambridge University Press, New Delhi, 2009.
4. Rama Krishna Rao, A, “Learning English: A Communicative Approach” Orient Black Swan, Hyderabad, 2008.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Improve their vocabulary and appropriate usage of words in different academic and professional contexts.
- CO2: Familiarize with different rhetorical functions of technical English.
- CO3: Develop strategies that could be adopted while reading texts.
- CO4: Speak effectively in English and career related situations.
- CO5: Acquire knowledge in academic and professional writing.

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1									2	3		1	
CO2									2	3			
CO3				2					2	3		1	
CO4									2	3			
CO5				1					1	3		1	

3 – Substantial, 2 – Moderate, 1 – Slight

**11MA101 ENGINEERING MATHEMATICS – I**  
(Common to all Engineering and Technology branches)

**3      1      0      4**

**MODULE – I** **15**

**Matrices:** Linear independent and dependent of vectors – Characteristic equation – Eigen values and Eigen vectors of a real matrix – Properties of eigen values and eigen vectors (without proof) – Cayley – Hamilton theorem (without proof).

**Diagonalisation:** Similarity transformation (concept only) – Orthogonal matrices – Orthogonal transformation of a symmetric matrix to diagonal form – Nature of quadratic form – Reduction of quadratic form to canonical form by orthogonal transformation.

**MODULE – II** **15**

**Differential Calculus:** Curvature – Cartesian co-ordinates – Centre and radius of curvature – Circle of curvature. Involutives and evolutes – Envelopes – Properties of envelopes and evolutes.

**Functions of several variables:** Functions of two variables – Partial derivatives – Total differential – Maxima and minima – Constrained maxima and minima – Lagrange’s multiplier method – Jacobians.

**MODULE - III** **15**

**Differential Equations:** Linear differential equations of Second and higher order with constant coefficients when the R.H.S is  $e^{ax}$ ,  $x^n$ ,  $n > 0$ ,  $\sin ax$ ,  $\cos ax$ ,  $e^{ax}x^n$ ,  $e^{ax} \sin bx$ ,  $e^{ax} \cos bx$ ,  $x^n \sin ax$  and  $x^n \cos ax$ – Differential Equations with variable coefficients (Cauchy’s form). Method of variation of parameters - Simultaneous first order linear equations with constant coefficients.

**Applications of Differential Equations:** Solution of specified differential equations connected with electric circuits, simple harmonic motion (Differential equations and associated conditions need to be given).

**Lecture: 45, Tutorial: 15, TOTAL: 60**

**TEXT BOOKS**

1. Kandasamy. P, Thilagavathy. K and Gunavathy. K, “Engineering Mathematics For First Year B.E/B.Tech”, Reprint Edition 2011, S.Chand and Co., New Delhi.
2. Veerarajan. T., “Engineering Mathematics, (for first year), Reprint Edition 2011, Tata McGraw-Hill New Delhi.

**REFERENCE BOOKS**

1. Grewal. B.S, “Higher Engineering Mathematics”, 40<sup>th</sup> Edition, Khanna Publications, New Delhi, 2007.
2. Jain R.K and Iyengar S.R.K, “Advanced Engineering Mathematics”, 3<sup>rd</sup> Edition, Narosa Publishing House, New Delhi, 2007.
3. Bali N.P and Manish Goyal, “Text Book of Engineering Mathematics”, 3<sup>rd</sup> Edition, Laxmi Publications, New Delhi, 2008.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Identify and solve algebraic Eigen value problems from practical area
- CO2: Understand the geometric aspects of curvature, maxima and minima concepts as elegant applications of differential equations.
- CO3: Solve differential equations of certain types and to handle application in engineering fields

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	3												2
CO2	3												2
CO3	2												2

3 – Substantial, 2 – Moderate, 1 – Slight

**11PH101 APPLIED PHYSICS**  
(Common to all Engineering and Technology branches)

3      0      0      3

**MODULE – I**

**15**

**Acoustics :** Classification of sound – Characteristics of musical sound – Weber-Fechner law – Absorption Coefficient – Reverberation – Reverberation time – Sabine’s formula (growth & decay) – Factors affecting acoustics of buildings (reverberation time, loudness, focusing, echo, echelon effect, resonance and noise) and their remedies.

**Ultrasonics :** Introduction – Production – Magnetostriction effect – Magnetostrictive generator - Inverse piezoelectric effect - Piezoelectric generator - Detection of ultrasonics - Properties – Cavitation - Industrial applications – drilling, welding, soldering and cleaning – SONAR - Non destructive testing – Ultrasonic pulse echo system - Medical applications – A, B and C Scan displays – Ultrasonic imaging technique.

**MODULE – II**

**15**

**Lasers:** Introduction – Principle of spontaneous emission and stimulated emission - Population inversion, Pumping, Einstein’s Coefficients (A&B) - Types of lasers – Nd:YAG, CO<sub>2</sub>, Semiconductor lasers: Homojunction and Heterojunction – Laser Applications – Industrial applications – Laser welding, Laser cutting, Laser drilling – Holography – Construction and reconstruction of images.

**Fiber Optics & Applications:** Principle – Classification based on materials, Modes of propagation, Refractive index profile - Crucible-crucible technique of fiber fabrication - Light sources for fiber optics – Detectors - Fiber optical communication links - Losses in optical fibers – Fiber optic sensors – Temperature, displacement, voltage and magnetic field measurement.

**MODULE - III**

**15**

**Quantum Physics and Applications:** Black body radiation – Planck’s theory (derivation)– Deduction of Wien’s displacement law and Rayleigh – Jean’s Law from Planck’s theory – Compton effect – Theory and experimental verification - Matter waves – Uncertainty principle - Experimental verification – Schroedinger’s wave equations – Time independent and time dependent equation – Physical Significance of wave function – Particle in a box (One dimensional) - Optical microscope – Limitations of optical microscopy - Scanning electron microscope - Transmission electron microscope.

**TOTAL : 45**

**TEXT BOOKS**

1. Avadhanalu M N and Kshirsagar P G, “A Text Book of Engineering Physics”, S.Chand & company Ltd, New Delhi, 2007.
2. Palanisamy P K, “Engineering Physics”, Scitech Publications, Chennai, 2008.

**REFERENCE BOOKS**

1. Gaur R K and Gupta S L, “Engineering Physics”, Dhanpat Rai and Sons, New Delhi, 2006.
2. Rajendran V, “Engineering Physics”, Prentice Hall of India, New Delhi, 2008.
3. Rajagopal K, “Textbook of Engineering Physics”, Part I, PHI Learning Pvt. Ltd., New Delhi, 2008.
4. Personick S D, “Fibre Optics, Technology and Applications”, Khanna Publishers New Delhi, 1987.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Infer and apply the basic concepts of design of acoustically good buildings and ultrasonics in engineering and technology.
- CO2: Demonstrate the basics of fiber optic communication system and laser phenomena, and make use of them in engineering and technology.
- CO3: Relate and inference the concepts of quantum physics to optical, electrical and other physical phenomena.

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	3			2	2		2		1				
CO2	3			2	2		2		1				
CO3	3			2	2		2		1				

3 – Substantial, 2 – Moderate, 1 – Slight

**11CY101 APPLIED CHEMISTRY**  
(Common to all Engineering and Technology branches)

3 0 0 3

**MODULE – I**

**15**

**Water:** Introduction - Sources of water - impurities in water - Types of water - Water quality standards - Water quality parameters (Discussion not required) - Hardness of water- Expression of hardness - Units of hardness –Estimation of Hardness of water by EDTA method – Determination of alkalinity - Disadvantages of using hard water - Boiler troubles due to hard water - scale and sludge formation – Boiler corrosion – caustic embrittlement- priming and foaming-Softening of water- External treatment methods - Lime soda, zeolite and demineralization process (principle, process, advantages and disadvantages only) Internal treatment process - colloidal, carbonate, calgon and phosphate conditioning (brief discussion only) - desalination by reverse osmosis method. **Electrochemistry:** Introduction - Cells – Representation of a galvanic cell - EMF measurements and its applications – Electrode potential - Nernst Equation – Reference electrodes (hydrogen and calomel electrodes) – Electrochemical series and its applications – Conductometric titrations (strong acid Vs strong base only ) - Batteries – Lead acid and Ni-Cd batteries.

**MODULE – II**

**15**

**Corrosion and Its Control:** Introduction – Mechanism of dry and wet corrosion – galvanic corrosion - concentration cell corrosion – Galvanic series - Factors influencing rate of corrosion – corrosion control methods - Sacrificial anode and impressed current cathodic method – Corrosion inhibitors - Protective coatings - classifications - Pretreatment of metal surface - Metallic coating -electroplating and electrolessplating (General discussion) - Hot dipping (Tinning and galvanising) - Nonmetallic coating - surface conversion coating (phosphate coating and anodized coating) - Organic coating - paints – constituents and their function – Special paints (Fire retardant, temperature indicating, water repellent and luminescent paints)

**Combustion:** Introduction – Calorific Values – Gross and net – Theoretical calculation of minimum air for combustion (Theoretical aspects only) – flue gas analysis – Orsat’s method - Explosive range and Spontaneous Ignition Temperature.

**MODULE - III**

**15**

**Fuels:** coal – proximate and ultimate analysis – their importance – metallurgical coke - Otto-Hoffman byproduct method - Liquid fuel - refining of petroleum - Straight run, cracked and polymer petrol – Manufacture of synthetic petrol - polymerization (thermal and catalytic methods) - Hydrogenation of coal (Fisher Tropsch and Bergius methods) - knocking - octane number – improving octane number by additives – Diesel – cetane number – Gaseous fuels (Water gas, producer gas and biogas)

**Polymers:** Introduction – Nomenclature of polymers – functionality – polymerization - types – addition, condensation and co-polymerization with examples – Effect of polymer structure on properties (strength, plastic deformation, crystallinity and chemical resistance) - plastics – types (thermo and thermosetting plastics) - individual polymers - Polyethylene, polypropylene, PVC, Teflon, Bakelite and epoxy resin (preparation, properties and uses only) - Compounding of plastics- Fabrication of plastics (compression, injection and extrusion moulding methods) – conducting polymers

**TOTAL : 45**

**TEXT BOOK**

- Jain PC and Monica Jain, “Engineering Chemistry”, 15<sup>th</sup> Edition, Dhanpat Rai publication Co., New Delhi, 2008.

**REFERENCE BOOKS**

- Dara S.S., “A Text Book of Engineering Chemistry”, S.Chand & Co. Ltd., New Delhi, 2006.
- Sharma B.K., “Engineering Chemistry”, Krishna Prakasan Media (P) Ltd., Meerut, 2001.
- Sivasankar B., “Engineering Chemistry”, Tata McGraw-Hill, New Delhi, 2008.
- Krishnamurthy N., “Engineering Chemistry”, 2<sup>nd</sup> Edition, PHI Learning private Limited, New Delhi, 2008.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Represent the water quality parameters, water treatment methods for potable and industrial purpose and apply the principles of electrochemistry for EMF measurement and energy storing devices
- CO2: Comprehend the effect of corrosion and corrosion control methods.
- CO3: Represent the calculation for calorific values, theoretical amount of minimum air required for complete combustion and flue gas analysis.
- CO4: Represents the types of fuel, engines , some individual polymers ,fabrications of plastics.

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	3	2		2	2		2	3	3	1	1		
CO2	3	2		2	2		2	3	3	1	1		
CO3	3	2		2	2		2	3	3	1	1		
CO4	3	2		2	2		2	3	3	1	1		

3 – Substantial, 2 – Moderate, 1 – Slight

# 11ME101 BASICS OF CIVIL AND MECHANICAL ENGINEERING

(Common to all Engineering and Technology branches)

3 0 0 3

## PART-A: CIVIL ENGINEERING

**MODULE – I** 7

**Construction Materials:** Introduction – Civil Engineering – Materials – bricks – stones – sand – cement – concrete – steel sections – Site selection for foundations – Bearing capacity – loads – Types of foundations – requirements.

**MODULE – II** 7

**Elements of Structures:** Superstructure – brick masonry – stone masonry – beams – columns – lintels – roofing – flooring – plastering – Types of Bridges and Dams.

**MODULE - III** 8

**Elements of Surveying:** Surveying – Objects – types – classification – principles – measurements of distances – Determination of areas – Building area calculation – illustrative examples – Basics of Interior and Landscaping.

## PART-B: BASIC MECHANICAL ENGINEERING

**MODULE – I Metal Forming and Joining Processes** 7

**Foundry:** Introduction- patterns – molding – casting - cupola furnace.

**Forming:** Introduction-Classification- Rolling, extrusion, and drawing.

**Welding:** Introduction-Classification - TIG, MIG welding, Gas welding, soldering and brazing.

**Machining process:** Introduction-Classification – lathe and drilling machines.

**MODULE – II Boilers and Power Plants** 8

**Steam Boilers:** Introduction-Classification- Working Principle of Cochran boiler, Babcock and Wilcox boiler- Benson boiler - Boiler Mountings and accessories. Power Plants: Classification of power plants – working principle of steam, Diesel, Hydro-electric and Nuclear Power plants-Merits and Demerits.

**MODULE – III IC Engines, Refrigeration and Air-conditioning** 8

**IC Engines:** Classification-components - Working principle of Petrol and Diesel Engines- Four stroke and two stroke cycles- Comparison of four stroke and two stroke engines. Working principle of carburetor, fuel pump and multi point fuel injector.

**Refrigeration and Air Conditioning System:** Terminology of Refrigeration and Air conditioning, Properties of refrigerant - Principle of vapour compression and absorption system - Layout of typical domestic refrigerator - Window and Split type room Air conditioner.

**TOTAL : 45**

### TEXT BOOKS

1. Palanichamy, M.S., “Basic Civil Engineering”, Tata McGraw-Hill, New Delhi, 2006.
2. Shanmugam, G, “Basic Mechanical Engineering”, 4<sup>th</sup> Edition, Tata McGraw-Hill, New Delhi, 2011.

### REFERENCE BOOKS

1. Rao, M.S., “Basics of Civil Engineering”, Dhanpat Rai and Co, New Delhi, 2006.
2. Venugopal, K and Prabhu Raja, V, “Basic Mechanical Engineering”, Sixth Edition, Anuradha Publishers, Kumbakonam, 2005.
3. Rao, P N, “Manufacturing Technology: Foundry, Forming And Welding”, Tata McGraw-Hill, New Delhi, 2008.
4. Rajan, T.S, “Basic Mechanical Engineering, 3rd Edition, New Age International Publishers, NewDelhi, 2009.

### COURSE OUTCOMES

On completion of the course the students will be able to

CO1: Get exposed to the basics of civil and mechanical engineering areas like construction materials, construction practices, surveying, boilers, I.C engines, power plants, refrigeration and air conditioning.

#### Mapping of Course Outcomes (COs) with Program Outcomes (POs)

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1					1			3				2	

3 – Substantial, 2 – Moderate, 1 – Slight



**11ME102 ENGINEERING DRAWING**  
(Common to all Engineering and Technology branches)

2 0 3 3

**Concepts (Not for Exam)**

Importance of graphics in engineering applications – Use of drafting instruments – BIS conventions and specifications – Size, layout and folding of drawing sheets – Lettering and dimensioning.

**MODULE – I**

**15**

**Projections of Points, Lines, Planes and Solids:**

General principles of orthographic projection – First angle projection – Layout of views – Projection of points, located in all quadrant and straight lines located in the first quadrant – Determination of true lengths and true inclinations and location of traces – Projection of polygonal surface and circular lamina inclined to both reference planes.

Projections of simple solids like prisms, pyramids, cylinder and cone when the axis is inclined to one reference plane by change of position method.

**MODULE – II**

**15**

**Sectioning and development of solids:**

Sectioning of solids- prisms, pyramids, cylinder and cone in simple vertical position by cutting planes inclined to one reference plane and perpendicular to the other – Obtaining true shape of section.

Development of lateral surfaces of simple and truncated solids – prisms, pyramids, cylinders and cone with cutout, perpendicular and inclined to the horizontal axis.

**MODULE- III**

**15**

**Isometric projection and Perspective projection :**

Principles of isometric projection – isometric scale – isometric projections of simple solids, truncated prisms, pyramids, cylinders and cones

Conversion of isometric projection into orthographic projection.

Perspective projection of prisms, pyramids and cylinders by visual ray method.

**TOTAL: 45**

**TEXT BOOKS**

1. Venugopal K. and Prabhu Raja V. “Engineering Graphics”, New Age International (P) Limited, New Delhi, 2008.
2. Dhananjay A. Jolhe, “Engineering Drawing with an introduction to AutoCAD”, Tata McGraw Hill, New Delhi, 2008.

**REFERENCE BOOKS**

1. Bhatt N.D, “Engineering Drawing”, 46<sup>th</sup> Edition, Charotar Publishing House, Anand, 2003.
2. Gopalakrishnana K.R., “Engineering Drawing”, Volume. I & II, Subhas Publications, Bangaluru, 2006.
3. Basant Agarwal and Agarwal C.M., “Engineering Drawing”, Tata McGraw-Hill, New Delhi, 2008.

**COURSE OUTCOMES**

On completion of the course the students will be able to

CO1: Prepare elementary sketches of 2D and 3D objects with correct interpretation of their geometry and topology.

CO2: Draw multi-view orthographic projections including sectional, true and development of solids.

CO3: Understand and draw isometric and perspective projections

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	2				2								
CO2	2				2								
CO3	2				2								

3 – Substantial, 2 – Moderate, 1 – Slight

**11PH102 PHYSICAL SCIENCES LABORATORY – I**  
(Common to all Engineering and Technology branches)

0 0 3 1

**PART-A: APPLIED PHYSICS LABORATORY**  
(Any five experiments)

**LIST OF EXPERIMENTS /EXERCISES**

1. (a) Particle size determination using Diode Laser.  
(b) Determination of Laser parameters – Wavelength and angle of divergence.  
(c) Determination of acceptance angle in an optical fiber.
2. Determination of thickness of a thin wire – Air wedge method.
3. Determination of velocity of sound and compressibility of liquid – Ultrasonic interferometer.
4. Determination of specific resistance of a given coil of wire – Carey Foster Bridge.
5. Determination of dispersive power of a prism using spectrometer.
6. Determination of Young's modulus of the material – non uniform bending.

**PART-B: APPLIED CHEMISTRY LABORATORY**  
(Any five experiments)

**LIST OF EXPERIMENTS /EXERCISES**

1. Estimation of Total, Temporary and Permanent hardness of water by EDTA method.
2. Estimation of Ca<sup>2+</sup> and Mg<sup>2+</sup> hardness separately by EDTA method.
3. Estimation of Alkalinity of a water Sample.
4. Conductometric titration - Mixture of acids.
5. Estimation of Hydrochloric acid using PH meter.
6. Estimation of Ferrous ion by Potentiometric titration.

**COURSE OUTCOMES**

On completion of the course the students will be able to

CO1: Get a basic idea of diode and LASER.

CO2: Familiarize the concepts of Ultrasonic.

CO3: Get a basic idea about the analysis of hardness, amount of Ca<sup>2+</sup> and Mg<sup>2+</sup>, presence of alkalinity in water

CO4: Get a basic idea about the handling of instruments like pH meter and conductivity meter for the estimation of unknown concentration of acids.

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	3	3		2	1		2		2				3
CO2	3	3		2	1		2		2				3
CO3	3	3		2	1		2		2				3
CO4	3	3		2	1		2		2				3

3 – Substantial, 2 – Moderate, 1 – Slight

**11ME103 ENGINEERING PRACTICES LABORATORY**  
(Common to all Engineering and Technology branches)

0 0 3 1

**PART-A: CIVIL & MECHANICAL**

**LIST OF EXPERIMENTS**

**1.FITTING**

Tools & Equipments – Practice in Filing and Drilling.  
Making Vee Joints, Square, dovetail joints, Key Making.

**2. PLUMBING**

Tools & Equipments - Pipe connection for a bath room, Pipe connection for multi-storey building,  
Pipe connection with different components like valves, tap, coupling, union, reducers, elbows etc.  
Plumbing work with metal, PVC and flexible hoses (Threading, joining of pipes)

**3.CARPENTRY**

Tools and Equipments- Planning practice. Making Half Lap, dovetail, Mortise & Tenon joints, a mini model of a single door window frame.

Making of Pen stand, Box, etc. from plywood. (Use of modern power tools for cutting )

**4.SHEET METAL**

Tools and equipments - Fabrication of a small cabinet, Rectangular Hopper, etc.

**5.WELDING**

Tools and equipments - Arc and Gas welding of butt joint, Lap Joint and Tee Fillet.

**REFERENCES / MANUALS / SOFTWARE:**

1. Suyambazhahan, S, “Engineering Practices Laboratory Manual”, PHI Learning, NewDelhi, 2010.
2. John, K. C., “Mechanical Workshop Practice”, Second Edition, PHI Learning, NewDelhi, 2009.

**PART-B: ELECTRICAL & ELECTRONICS**

1. Safety aspects of Electrical wiring.
2. Wiring circuit for a lamp using single and two way switches (stair case).
3. Wiring circuit for fluorescent lamp.
4. Study of Electronic components and equipment – Resistor-colour coding, measurement of AC Signal parameter (Peak-Peak, RMS Value, Frequency and Power factor ) using CRO
5. Assembling electronic components on a small PCB ( Etching, Fabrication and Testing)
6. Measurement of earth resistance and insulation resistance of an electrical equipment
7. Study of Telephone, FM radio & Transducers.
8. Study of Mixie, Iron box, Ceiling & Table Fans.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Ability to demonstrate an understanding of different tools used in fitting, carpentry, sheet metals, plumbing and welding.
- CO2: Ability to prepare different type of simple models in fitting, carpentry, sheet metals, plumbing and welding.
- CO3: Ability to appreciate and adhere to the safety.

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	1				1			2			2	1	2
CO2	1				1			2			2	1	2
CO3					3			2			2	3	

3 – Substantial, 2 – Moderate, 1 – Slight

**11EL201 COMMUNICATION SKILLS**  
(Common to all Engineering and Technology branches)

**3    0    0    3**

**MODULE – I**

**15**

**Focus on language:** Cause and effect expressions - indicators of purpose and function - connectives -imperatives - modal verbs - infinitives and gerunds - reporting verbs - homonyms - commonly confused (mispronounced and misspelt) words - phrasal verbs - British and American Vocabulary.- rules for writing SI [ system international ] units - concord.

**MODULE – II**

**15**

**Listening:** Listening practice - Radio / TV news - documentaries - listening to short and long conversations in different domains of activity/ live speech - new inventions, products, announcements, casual conversation, and academic lectures.  
**Writing:** Formal letter writing ( letter of application - job application) , Business (calling for quotation, placing orders , letter of complaint ) - structure of memorandum and technical reports (reports on visits made to industries, report on an accident in the factory, meeting report) – notices - agenda - instructions - e-mails - Preparing Checklist- note taking and note making.

**MODULE- III**

**15**

**Speaking:** Communication – accuracy, fluency, appropriateness – levels of formality – oral practice activities related to professional skills – role play using different functions (persuasion, negotiation, giving directions and guidance ) – conversational etiquette (greetings, making requests, permission, accepting, denying, declining, politeness strategies, turn-taking, body language) – making speeches – describing people, place, things and events.  
**Reading:** Reading comprehension – guided note- making – providing a suitable title - identifying main points, supporting ideas – evaluating the style ( argumentative / descriptive etc) – drawing inferences separating facts from opinions – interpreting text in different genres.

**TOTAL : 45**

**TEXT BOOK**

1. Department of Science and Humanities, Anna University, Chennai. “English for Engineers and Technologists”, Combined Edition Volumes (I & II), Orient Longman, Oxford University Press, New Delhi, 2006.

**REFERENCE BOOKS**

1. Kiranmai. Dutt P, Geetha Rajeevan and Prakash, C. L. N., “A Course in Communication Skills”, Cambridge University Press, New Delhi, 2007.
2. Meenakshi Raman and Sangeetha Sharma, “Technical Communication”, Oxford University Press, New Delhi, 2006.
3. Sangeetha Sharma and Binod Mishra, “Communication Skills for Engineers and Scientists”, PHI Learning, New Delhi, 2009.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Improve their vocabulary and appropriate usage of words.
- CO2: Familiarize with different rhetorical functions of technical English.
- CO3: Speak effectively in English in real-life and career-related situations.
- CO4: Acquire knowledge in academic and professional writing.

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1									2	3		1	
CO2									2	3			
CO3									1	3			
CO4				1					1	3		1	

3 – Substantial, 2 – Moderate, 1 – Slight

**11MA201 ENGINEERING MATHEMATICS – II**  
(Common to all Engineering and Technology branches)

**3    1    0    4**

**MODULE – I**

**15**

**Multiple Integrals:** Double integration in Cartesian coordinates – Change of order of integration – Area between two curves – Area as double integrals – Triple integration in Cartesian coordinates – Volume as Triple integrals (Simple problems only).

**Vector Calculus:** Gradient, divergence and curl – Line, surface integral (Concept Only) and volume integrals (Concept Only) – Green’s, Gauss divergence and Stoke’s theorems (without proof) – Verification of the above theorems and evaluation of integrals using them (Simple problems only).

**MODULE – II**

**15**

**Analytic Functions:** Functions of a complex variable – Analytic functions – Necessary conditions and Sufficient conditions (excluding proof) – Cauchy– Riemann equations — Properties of analytic function (Statement only) –

Harmonic functions – Construction of Analytic functions – Conformal mapping:  $w = z + a, az, \frac{1}{z}$  - Bilinear transformation.

**Complex Integration:** Cauchy’s theorem (without proof) – Cauchy’s integral formula – Taylor and Laurent’s series (without proof) – Singularities – Classification – Cauchy’s residue theorem (Statement only) – Contour integration – circular and semi-circular contours (excluding poles on real axis).

**MODULE – III**

**15**

**Laplace Transforms:** Conditions for existence – Transform of elementary functions – Basic properties – Derivatives and integrals of transforms – Transforms of derivatives and integrals – Initial and final value theorems – Transform of unit step function – Transform of periodic functions.

**Inverse Laplace transforms:** Inverse Transform of elementary functions – Partial fraction method – Convolution theorem (without proof) – Solution of linear ODE of second order with constant coefficients.

**Lecture: 45, Tutorial: 15, TOTAL: 60**

**TEXT BOOKS**

- Kandasamy. P, Thilagavathy. K and Gunavathy. K, “Engineering Mathematics For First Year B.E/B.Tech”, Reprint Edition 2011, S.Chand and Co., New Delhi.
- Veerarajan. T., “Engineering Mathematics, (for first year), Reprint Edition 2011, Tata McGraw-Hill New Delhi.

**REFERENCE BOOKS**

- Grewal. B.S, “Higher Engineering Mathematics”, 40<sup>th</sup> Edition, Khanna Publications, New Delhi, 2007.
- Jain R.K and Iyengar S.R.K, “Advanced Engineering Mathematics”, Third Edition, Narosa Publishing House, New Delhi, 2007.
- Bali. N.P and Manish Goyal, “Text Book of Engineering Mathematics”, Third Edition, Laxmi Publications, New Delhi, 2008.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Identify problems involving vectors, double and triple integrals
- CO2: Measure the knowledge of analytic functions.
- CO3: Evaluate complex integrals which are extensively applied in engineering.
- CO4: Adapt Laplace transforms to solve practical problems.

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	3	3		1	2							1	3
CO2	3											1	3
CO3	3	3		1	2							1	3
CO4	3	3		1	2							1	3

3 – Substantial, 2 – Moderate, 1 – Slight

**11PH201 MATERIALS SCIENCE**  
(Common to all Engineering and Technology branches)

**3    0    0    3**

**MODULE – I**

**15**

**Crystal Physics:** Introduction – Lattice – Unit cell – Crystal systems – Bravais lattice – Lattice planes – Miller indices – d spacing in cubic lattice – Atomic radius – Coordination number – Packing factor for SC, BCC, FCC and HCP structures – Crystal imperfections : Point, line and surface imperfections. **Conducting Materials:** Conductors – Classical free electron theory of metals – Electrical and thermal conductivity – Wiedemann – Franz law – Lorentz number – Draw backs of classical theory – Quantum theory – Fermi distribution function – Effect of temperature on Fermi Function – Density of energy states – Carrier concentration in metals.

**MODULE – II**

**15**

**Semiconducting Materials:** Intrinsic semiconductor – Carrier concentration derivation – Extrinsic semiconductors – Carrier concentration derivation in n-type and p-type semiconductors – Hall effect – Determination of Hall coefficient – Applications - Semiconductor devices – Solar cells - LDR. **Magnetic and Dielectric Materials:** Types of magnetic materials – Domain theory – Hysteresis – Soft and hard magnetic materials - Magnetic devices – Transformer core - Magneto optical recording - Dielectric constant - Qualitative study of polarization – Frequency and temperature dependence of polarization – Dielectric loss – Dielectric breakdown – Uses of dielectric materials (capacitor and transformer) – Ferro electric materials.

**MODULE- III**

**15**

**Smart Materials :** Metallic glasses: Preparation, properties and applications - Shape memory alloys (SMA): Characteristics, properties, applications, advantages and disadvantages of SMA – Superconductors: Properties – Types of superconductors – BCS theory of superconductivity(Qualitative) - High  $T_c$  superconductors – Applications of superconductors – SQUID – cryotron - magnetic levitation. **Nano Materials:** Synthesis: Lithographics – Vapour phase physical and chemical deposition methods - Colloidal and solgel methods - Properties of nanoparticles and applications - Carbon nanotubes: Structure – Properties – Fabrication by Laser ablation – Applications.

**TOTAL : 45**

**TEXT BOOKS**

1. Kittel. Charles, “Introduction to Solid State Physics”, Seventh Edition, John Wiley & sons, Singapore, 2007.
2. Poole. Charles P and Owen. Frank J., “Introduction to Nanotechnology”, Wiley India, 2007. (For Module III).

**REFERENCE BOOKS**

1. Pillai. S O, “Solid State Physics”, Fifth Edition, New Age International, New Delhi, 2003.
2. Rajendran. V, “Engineering Physics”, Prentice Hall of India, New Delhi, 2008.
3. Palanisamy. P K, “Engineering Physics - II”, SciTech publications (India), Chennai 2008.
4. Raghavan. V, “Materials Science and Engineering: A first course”, Fifth Edition, Prentice Hall of India, New Delhi, 2009.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Infer the basics of crystal physics and conducting materials.
- CO2: Apply the concepts of semiconducting materials, devices, and magnetic and dielectric materials in engineering and technology.
- CO3: Interpret the preparation and applications of smart materials and nano materials.

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	3			2	2		2		1				
CO2	3			2	2		2		1				
CO3	3			2	2		2		1				

3 – Substantial, 2 – Moderate, 1 – Slight

**MODULE – I**

**Introduction to Environmental Studies and Natural Resources:** Introduction to Environmental Science – Forest resources: Use and over-exploitation, deforestation, case studies. – Water resources: Use and over-utilization of surface and ground water, dams - benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture - effects of modern agriculture, fertilizer and pesticide problems, water logging, salinity, case studies – Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources, case studies – Land resources: Land as a resource – Conservation Practices - Role of an individual in conservation of natural resources. **Ecosystems:** Concept of an ecosystem – Structural features – Functional attributes (Food chain and Food web only) – Introduction, types, characteristic features, structure and functions of the (a) Forest ecosystem (b) Aquatic ecosystems (ponds, rivers and oceans). **Biodiversity:** Introduction to Biodiversity – Definition - genetic, species and ecosystem diversity – Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic, option values and ecosystem service value– Hot-spots of biodiversity – Threats to biodiversity: habitat loss, poaching of wildlife – Endangered and endemic species of India – In-situ and Ex-situ conservation of biodiversity.

**MODULE – II**

**Pollution:** Definition – Causes, effects and control measures of: (a) Air pollution - Climate change, global warming, acid rain, ozone layer depletion (b) Water pollution (c) Soil pollution (d) Radioactive Pollution - Solid waste Management - Disaster management: floods, earthquake, cyclones and landslides - Role of an individual in prevention of pollution - Case studies. **Water Treatment methods:** Treatment of Water for Domestic Supply (Screening, Aeration, Sedimentation with Coagulation, Filtration and Disinfection methods) - Break point chlorination –Estimation of dissolved oxygen, BOD and COD - Bacteriological examination of water - Sewage treatment (Primary, Secondary & Tertiary methods) - Miscellaneous methods of Sewage treatments (Oxidation Ponds, Aerated Lagoons, Oxidation ditch, Anaerobic Lagoons, Septic tanks) – Methods of Sewage treatment by activated sludge process – Introduction to industrial waste water treatment using Reverse Osmosis Technology- Self purification of Natural Waters - Membrane Technology for wastewater treatment - Activated carbon in pollution abatement of wastewater.

**MODULE- III**

**Social Issues and the Environment:** From Unsustainable to Sustainable development – Urban problems related to energy – Water conservation, rain water harvesting, watershed management – Resettlement and rehabilitation of people - case studies – Environmental ethics - Issues and possible solutions - Wasteland reclamation – Consumerism and waste products – Environment Production Act – Air (Prevention and control of pollution) Act – Water (Prevention and control of pollution) Act – Wildlife protection Act – Forest conservation Act – Issues involved in enforcement of environmental legislation – Public awareness.**Human Population and the Environment:** Introduction - Population growth - Variation of population based on age structure - Variation among nations – Population explosion – Family welfare programme – Environment and human health – Human Rights – Value Education – HIV / AIDS – Women and Child welfare – Role of Information Technology in Environment and human health – Case studies.

**TOTAL : 45**

**TEXT BOOK**

- 1 Anubha Kaushik, and Kaushik C P, “Environmental Science and Engineering”, Third Edition: 2008, (Reprint 2010), New Age International (P) Ltd, New Delhi.

**REFERENCE BOOKS**

- 1 B.K.Sharma, “ Industrial Chemistry”,Tenth Edition, Krishna Prakashan Media(P) Ltd,Meerut-250001(UP), India.
- 2 B Uppal M M revised by S C Bhatia, “Environmental Chemistry”, Sixth Edition Khanna Publishers, New Delhi, 2002.
- 3 Trivedi R.K. and Goel P. K., “Introduction to Air Pollution”, Techno-Science Publications, Jaipur, 2003.
- 4 Masters. Gilbert M, “Introduction to Environmental Engineering and Science”, Second Edition, Pearson Education, New Delhi, 2004.
- 5 Miller, T.G., “Environmental Science”, Wadsworth Publishing Co.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Represent the importance of conservation of natural resources and gain the basic knowledge of maintaining ecological balance and conservation of biodiversity
- CO2: Comprehend the different types of pollution and waste water treatment methods
- CO3: Represent the awareness about making a clean environment and useful environment for the future generations, Consequences of population explosion and Social Issues.

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	3	2			3	2	3	2	1	1			
CO2	3	2			3	2	3	2	1	1			
CO3	3	2			3	2	3	2	1	1			

3 – Substantial, 2 – Moderate, 1 – Slight

## 11CS101 PROBLEM SOLVING AND PROGRAMMING

(Common to all Engineering and Technology branches)

3 0 0 3

### MODULE – I

15

**Basics:** Evolution of computers- Generations of computers- Classification of computers- Applications of computers- Hardware - Software-Information Technology-Internet Problem-Solving Techniques- Program Control Structures- Programming Paradigms and Languages-Generations of Programming Languages.

**Problem Solving:** Introduction – Problem Solving Aspects- Top-Down Design-Implementation of Algorithms-Program Verification- Efficiency of Algorithms- Analysis of Algorithms- Fundamental algorithm- Factorial Computation - Generation of Fibonacci Sequence.

### MODULE – II

15

**C Fundamentals and Arrays:** Introduction to C – C programming structure – C character set – Identifiers – keywords. Data types – Constants – variables- Operators – Expressions – Library functions Managing Input and Output – formatted input and output. Control statements – Decision making and branching – Looping structures- Arrays – One dimensional array – Two dimensional arrays – Multidimensional arrays. Character arrays and strings.

### MODULE - III

15

**Functions, Structures and Files:** Functions - User defined functions: declaration, definition function call and parameter passing mechanisms – Recursion –Array and Functions - User defined data types –typedef - Structures – Unions –File operations in C- Introduction to pointer –Pointer Declaration and Initialization-Accessing a Variable through a pointer-Difference between array and Pointers.

**TOTAL : 45**

### TEXT BOOKS

1. Kamthane, Ashok N. “Computer Programming”, Pearson Education, New Delhi, 2007.
2. Dromey, R.G., “How to solve it by Computers”, Pearson Publishers, New Delhi, 2007.

### REFERENCE BOOKS

1. Gottfried Byron S, “Programming with C”, Second Edition, Tata McGraw-Hill, New Delhi, 2006.
2. Kanetkar Yashavant P., “Let us C”, Fifth Edition, BPB publications, New Delhi, 2005.
3. Schildt Herbert, “The Complete Reference C”, Fourth Edition, Tata McGraw-Hill, New Delhi, 2000.

### COURSE OUTCOMES

On completion of the course the students will be able to

- CO1: Understand the concept of computing and methods of problem solving
- CO2: Develop programming skill in C language
- CO3: Understand the concepts of arrays and functions
- CO4: Implement file structures in C

### Mapping of Course Outcomes (COs) with Program Outcomes (POs)

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	3				2								2
CO2	3				3						2		3
CO3	3				3								3
CO4					2								3

3 – Substantial, 2 – Moderate, 1 – Slight



## 11EE101 BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING

(Common to Civil, Mechanical, Chemical, Food Technology, Computer Science and Information Technology branches)

3 0 0 3

### MODULE – I

15

**Electrical Systems:** Kirchoff's Laws – Resistors in series and Parallel, Voltage and Current division Rule, Mesh Analysis of Simple Resistive networks – Introduction to AC Circuits – Sinusoidal Voltage, Current, R.M.S and Average value. Power System: Introduction- Structure of electric power system- Transmission and Distribution systems – Various levels of Transmission and Distribution Voltages.

**Electrical Machines: DC Machines** Construction, Principle of Operation, Basic Equation and Applications of: DC Generators (EMF equation), DC Motors (Torque equation).

### MODULE – II

15

**AC Machines:** Single Phase Transformer- Construction and Working Principle of Three Phase Induction Motors- Single Phase Induction Motors: Split Phase and Capacitor Start Motors.

**Semiconductor Devices and Applications:** Semiconductors and Junction Diodes : Distinction between Conductors, Semiconductors and Insulators – Properties of Semiconductors – PN Junction Diode- Rectifiers and Filters- Zener Diodes – Zener Diode Voltage Regulator– LEDs. Junction Transistors: Principle of Operation – CE, CB and CC Configurations – Static Characteristics – CE Transistor as an Amplifier – Characteristics and Applications of SCR and UJT.

**Digital Electronics:** Introduction– Binary Number Systems and Conversions – Binary Addition and Subtraction -Logic Gates and Truth tables.

### MODULE - III

15

**Digital Electronics:** Boolean Algebra: Basic laws and Demorgan's theorem – Simplification of Boolean Functions —Full Adder and Full Subtractor – Flip-Flops: RS,JK,D and T – Counter: 4 Bit Binary Ripple Counter.

**Linear IC'S:** OPAMPs: – Ideal Characteristics –Applications of OP-Amps: Inverting and Non-Inverting Amplifier, Voltage Follower, Adder and Subtractor.

**Fundamentals of Communication Engineering:** Introduction – Need for Modulation – Amplitude Modulation – Frequency Modulation – Comparison of AM & FM Communication Systems (Block Diagram approach): Radio, TV: Standards, Transmitter and Receiver- Satellite and Optical Fibre Communication

**Powersupplies (Block Diagram Approach) :** Regulators, UPS and SMPS

**TOTAL : 45**

### TEXT BOOKS

1. Hughes Edward., Smith Mckenzie., Hiley John and Brown Keith., "Electrical and Electronic Technology", 9th Edition, Pearson Education, New Delhi.
2. Muthusubramanian, Salivahanan R.S. and Muraleedharan K.A., "Basic Electrical, Electronics and Computer Engineering", Tata McGraw-Hill, New Delhi, 2007.

### REFERENCE BOOKS

1. Millman and Halkias, "Integrated Electronics", Tata McGraw-Hill, New Delhi, 1998.
2. Kennedy, David, "Electronic Communication Systems", Tata McGraw – Hill, New Delhi, 2000.
3. Gayakward, Ramakant A. "Op-Amps and Linear Integrated Circuits", Pearson Education, New Delhi, 2002.
4. Metha, V.K and Rohit Mehta, "Principles of Power System", S. Chand & Company Ltd., New Delhi, 2006.
5. Smarajit Ghosh, "Electrical and Electronics Engineering", Second Edition, Prentice Hall of India, New Delhi, 2009.

### COURSE OUTCOMES

On completion of the course the students will be able to

CO1: develop a basic understanding of the concept of electrical systems

CO2: illustrate the construction and working of different types of electric machines

CO3: gain basic knowledge of analog and digital electronics

### Mapping of Course Outcomes (COs) with Program Outcomes (POs)

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	3				1			2	1		1		
CO2	2				1			1					
CO3	2			1							1	1	1

3 – Substantial, 2 – Moderate, 1 – Slight

**11PH202 PHYSICAL SCIENCES LABORATORY – II**  
(Common to all Engineering and Technology branches)

0 0 3 1

**PART - A: APPLIED PHYSICS LABORATORY**  
(Any five experiments)

**LIST OF EXPERIMENTS /EXERCISES**

1. Determination of band gap of a semiconductor material.
2. Determination of wavelength of mercury spectrum – spectrometer grating.
3. Determination of thermal conductivity of a bad conductor – Lee’s Disc method.
4. Determination of hysteresis loss in a ferromagnetic material.
5. Determination of Young’s modulus of the material – uniform bending.
6. Determination of viscosity of liquid – Poiseuille’s method.

**PART - B: APPLIED CHEMISTRY LABORATORY**  
(Any five experiments)

**LIST OF EXPERIMENTS /EXERCISES**

1. Estimation of Chloride in a given water sample.
2. Determination of Dissolved Oxygen in a sample of water / sewage.
3. Estimation of Chromium in Industrial waste water.
4. Estimation of Ferrous ion in rust solution.
5. Estimation of percentage of Copper present in brass.
6. Estimation of ferric ion by Spectrophotometric method.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: perform experiments on semiconductors, thermal conductivity, optics, elasticity, viscosity of liquids.
- CO2: understand the concepts of wavelength, band gap, thermal conductivity, Young’s modulus and viscosity.
- CO3: get a knowledge about the estimation of DO, chloride, chromium, ferrous ion and copper in wastewater.
- CO4: get an idea about the estimation of iron in unknown solution using spectrophotometer.

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	3	3		2	1		2		2				
CO2	3	3		2	1		2		2				
CO3	3	3		2	1		2		2				
CO4	3	3		2	1		2		2				

3 – Substantial, 2 – Moderate, 1 – Slight

**LIST OF EXPERIMENTS /EXERCISES**

**A) APPLICATION PACKAGES**

1. To create an advertisement using word
2. To illustrate the concept of mail merging using word
3. To create a spread sheet to analyse the marks of the students of a class and also to create appropriate charts using excel
4. To create the presentation for the department using power point
5. To create the presentation for digital computers using power point

**B) C PROGRAMMING ( ANY TWO PROGRAMS IN EACH SECTION)**

6. Simple programs using decision making and branching:
  - a. Program to find biggest of three numbers
  - b. Design of simple menu driven calculator
  - c. Program to find the roots of the quadratic equation
  - d. Program to convert the given decimal number to binary
  - e. Program to print the prime numbers between 100 to 500
  - f. Program to print the electricity bill in a specified format applying specified rules
7. Programs using arrays:
  - a. Program to find the biggest number in the array
  - b. Menu driven program to insert and delete a specified element from the array
  - c. Program to arrange the elements of the array in ascending order  
Program to merge given two one dimensional arrays and to remove the duplicates
  - e. Program for multiplication of two matrices
8. String manipulations:
  - a. Program to find the length of the string, copy one string to another, compare two strings and concatenate two strings without using library functions.
  - b. Program to check whether the given string is a palindrome or not without reversing.
  - c. Program to find the occurrence of a substring in a main string and replace the substring by another string.
  - d. Arranging the list of names in alphabetical order
  - e. Program to count the number of occurrences of vowels, consonants, words, white spaces and special characters in the given statement.
9. Functions:
  - a. Program to swap the contents of two variables using functions (Pass by address and pass by reference)
  - b. Program to print the Fibonacci series using recursive function
  - c. Program to print the average and standard deviation of the elements of the one dimensional array using function.
  - d. Program to print the transpose of a matrix using functions
  - e. Menu driven program to perform string operations using functions
10. Structures and file operations:
  - a. Define a structure to store the student details viz., Roll no, name, marks in three subjects, total, avg and class obtained. Read the first three fields and write your logic to calculate the total, average and class obtained for ten students. Print the results in the order of rank obtained.
  - b. Structure based program to print the pay slip of an employee.
  - c. Program using files to copy the contents of one file to another

**REFERENCES / MANUALS/SOFTWARE:**

**Software requirements**

Operating System: Windows / Linux, Compiler : C compiler, Packages: MS office or Equivalent

**COURSE OUTCOMES**

**On completion of the course the students will be able to**

CO1: Solve specific problems with the application packages in C programming

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	I	j	k	l	m
CO1		3			3				2			3	

3 – Substantial, 2 – Moderate, 1 – Slight

**11EE203 ELECTRICAL AND ELECTRONICS ENGINEERING LABORATORY**  
(Common to CSE and IT branches)

**0 0 3 1**

**LIST OF EXPERIMENTS /EXERCISES**

1. Verification of Ohm's Laws and Kirchoff's Laws.
2. Measurement of real power, reactive power, power factor and impedance of RC, RL and RLC Circuits.
3. Open circuit and load characteristics of DC shunt generator.
4. Load characteristics of single phase Transformer.
5. Forward and Reverse characteristics of PN diode and Zener Diode.
6. Implementation of Half wave and Full wave Rectifier with simple Capacitor Filter.
7. Input and Output characteristics of BJT in Common Emitter configuration.
8. Characteristics of UJT and SCR.
9. Verification of truth table for various Logic Gates.
10. Design and verification of Half adder, Full adder, Half subtractor and Full subtractor.
11. Verification of Flip Flops (RS, JK, D and T flip Flops).
12. Implementation and Verification of BCD Decade Counter.

**COURSE OUTCOMES**

On completion of the course the students will be able to

CO1: perform basic electrical connections for simple circuits

CO2: analyze the performance characteristics of electrical machines

CO3: construct and analyze basic electronic circuits

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	3	1			1								
CO2	2	2			1								
CO3	2				1				2		1	1	1

3 – Substantial, 2 – Moderate, 1 – Slight

### 11MA301 ENGINEERING MATHEMATICS – III

(Common to all Engineering and Technology branches)

3 1 0 4

#### MODULE – I

**Fourier Series:** Dirichlet's conditions – General Fourier series – Odd and even functions – Half range sine series – Half range cosine series – Change of interval - Parseval's Identity - Harmonic analysis.

15

#### MODULE - II

**Partial Differential Equations:** Formation – By elimination of arbitrary constants and arbitrary functions – Standard types– Lagrange's linear equation- Linear partial differential equations of second order with constant coefficients.

**Applications of Partial Differential Equations:** Classification of second order quasi linear partial differential equations – Solutions of one dimensional wave equation – One dimensional heat equation – Steady state solution of two-dimensional heat equation (Insulated edges excluded).

15

#### MODULE - III

**Fourier transform:** Fourier integral theorem (Statement only) – Fourier transform pair – Properties – Transforms of simple functions – Sine and Cosine transforms – Convolution theorem and Parseval's identity (Statement only).

**Z-transform:** Elementary properties – Transforms of simple functions - Inverse Z – transform(Partial Fraction Method and Residue method) – Convolution theorem (Statement Only) – Solution of Difference Equations.

15

Lecture : 45, Tutorial : 15, TOTAL : 60

#### TEXT BOOKS

1. Kandasamy, P., Thilagavathy, K., and Gunavathy, K., "Engineering Mathematics", Volume - III, S. Chand & Co, New Delhi, 2008.
2. Veerarajan, T., "Engineering Mathematics", Tata McGraw-Hill, New Delhi, Reprint 2010.

#### REFERENCE BOOKS

1. Grewal, B.S., "Higher Engineering Mathematics", Thirty Sixth Edition, Khanna Publishers, New Delhi, 2007.
2. Wylie, C. Ray and Barrett, Louis, C., "Advanced Engineering Mathematics", Sixth Edition, McGraw-Hill, New York, 2004.
3. Andrews, L. A. and Shivamoggi, B. K., "Integral Transforms for Engineers and Applied Mathematicians", Macmillan, New York, 2004.

#### COURSE OUTCOMES

On completion of the course the students will be able to

- CO1: Express periodic functions in terms of trigonometric series
- CO2: Formulate and solve multidisciplinary engineering problems using partial differential equations for variety of applications
- CO3: Acquire basic skills in the areas of boundary value problems and transform techniques

#### Mapping of Course Outcomes (COs) with Program Outcomes (POs)

COs/POs	a	b	c	d	e	f	g	h	i	J	k	l	m
CO1	3								2		1		
CO2	3				1				2		2		
CO3	3								1		2		

3 – Substantial, 2 – Moderate, 1 – Slight

**11IT301 DATA STRUCTURES**  
(Common to ECE and IT branches)

**3 0 0 3**  
**15**

**MODULE – I**

**Advanced C:** Structure - Pointer – void pointer –null pointer – use of pointers-arrays and pointers – Pointers and strings – Pointer arithmetic – Pointers to pointers – array of pointers – Pointers to an array – 2D arrays and pointers – 3D arrays – Pointers to functions – Dynamic memory allocation. **Lists, Stacks and Queues:** Introduction to Data Structures- Algorithm Analysis – Running time calculations - Abstract Data Type (ADT) – The List ADT – The Stack ADT – The Queue ADT.

**MODULE - II**

**Trees:** Preliminaries – Binary Trees – The Search Tree ADT – Binary Search Trees – AVL Trees – Tree Traversals – Hashing – General Idea – Hash Function – Separate Chaining – Open Addressing – Linear Probing – Priority Queues (Heaps) – Model – Simple implementations – Binary Heap. **Sorting:** Preliminaries – Insertion Sort – Shell Sort – Heap Sort – Merge Sort – Quick Sort – External Sorting.

**MODULE - III**

**Searching:** Searching techniques- binary search-indexed sequential search  
**Graphs:** Definitions – Topological Sort – Shortest-Path Algorithms – Unweighted Shortest Paths – Dijkstra’s Algorithm – Minimum Spanning Tree – Prim’s Algorithm – Kruskal’s Algorithm – Applications of Depth-First Search – Undirected Graphs – Biconnectivity.

**TOTAL : 45**

**TEXT BOOKS**

- Weiss, M. A., “Data Structures and Algorithm Analysis in C”, Second Edition, Pearson Education Asia, New Delhi, 2002.
- Dey, Pradeep and Ghosh, Manas., “Computer Fundamentals and Programming in C”, Oxford University Press, New Delhi, 2006.

**REFERENCE BOOKS**

- Langsam, Y., Augenstein, M. J. and Tenenbaum, A. M., “Data Structures using C”, Pearson Education Asia, New Delhi, 2004.
- Gilberg, Richard F and Forouzan, Behrouz A., “Data Structures – A Pseudocode Approach with C”, Thomson Brooks / COLE, Singapore, 1998.
- Instructional Software Research and Development (ISRDR) Group, “Data structures using C”, Tata McGraw-Hill, New Delhi, 2007.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Understand the procedures of stack, queue and list using pointers and structures.
- CO2: Identify the different strategies of tree structures.
- CO3: Implement and compare various sorting and searching techniques.
- CO4: Analyze different techniques to find the shortest path in a graph structure
- CO5: Identify relevant data structure for the given problem and develop it in C

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	3												
CO2	3				3								
CO3	3		3		3			2					
CO4	3							2					
CO5	3		3										

3 – Substantial, 2 – Moderate, 1 – Slight

**11EC301 DIGITAL ELECTRONICS**  
(Common to ECE, CSE and IT branches)

**3 1 0 4**

**MODULE – I**

**15**

**Number Systems:** Binary, Octal, Decimal, Hexadecimal Number systems – Complements – signed Binary numbers. Binary Arithmetic- Binary codes: Weighted –BCD-2421-Gray code-Excess 3 code-ASCII –EBCDIC.

**Boolean algebra:** Boolean postulates and laws –De-Morgan’s Theorem- Principle of Duality- Boolean expression – Boolean function- Minimization of Boolean expressions– Sum of Products (SOP) –Product of Sums (POS)-Minterm-Maxterm- Canonical forms – Conversion between canonical forms –Minimization: Karnaugh Map, Tabulation Method-Don’t care conditions. Logic Gates- Implementations of Logic Functions using gates, NAND –NOR implementations. TTL and CMOS Logic and their characteristics –Tristate gates

**MODULE - II**

**15**

**Combinational Circuits:** Design procedure of Combinational circuits:– Adders-Subtractors – Parallel adder/ Subtractor-Carry look ahead adder- BCD adder- Magnitude Comparator- Multiplexer/ Demultiplexer- encoder / decoder – parity generator and checker – code converters. Implementation of combinational logic using decoders and multiplexers.

**Synchronous Sequential Circuits:** Flip flops SR, JK, T, D and Master slave – Characteristic and excitation tables and equations –Level and Edge Triggering –Realization of one flip flop using other flip flops – Analysis and design of sequential circuits with State diagram, State table, State minimization and State assignment-Ripple counters –Design of Synchronous counters, Ring counters and Sequence detector - Registers – shift registers- Universal shift register.

**MODULE - III**

**15**

**Asynchronous Sequential Circuits:** Design of fundamental mode and pulse mode circuits – primitive state / flow table – Minimization of primitive state table –state assignment – Excitation table - cycles – Races –Hazards: Static –Dynamic – Essential –Hazards elimination.

**Memory Devices:** Classification of memories –RAM organization – Write operation –Read operation – Memory cycle - Timing wave forms – Memory decoding – memory expansion – Static RAM Cell-Bipolar RAM cell – MOSFET RAM cell –Dynamic RAM cell -SDRAM–ROM organization –Field Programmable Gate Arrays (FPGA)- Flash memory-NOR Flash memory cell- NAND Flash memory cell- Programmable Logic Devices –Programmable Logic Array (PLA)- Programmable Array Logic (PAL)

**Lecture : 45, Tutorial : 15, TOTAL : 60**

**TEXT BOOKS**

- Morris Mano, M, “Digital Design”, Third Edition, Prentice Hall of India, New Delhi, 2003.
- Roth Charles H., “Fundamentals of Logic Design”, Thomson Publication Company, New Delhi, 2003.

**REFERENCE BOOKS**

- Yarbrough, John M., “Digital Logic Applications and Design”, Thomson Publications, New Delhi, 2007.
- Leach, Donald P. and Malvino, Albert Paul., “Digital Principles and Applications”, Fifth Edition, Tata McGraw-Hill, New Delhi, 2003.
- Givone, Donald D., “Digital Principles and Design”, Tata McGraw-Hill, New Delhi, 2003.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Understand the basics of design of circuits
- CO2: Analyze the usage of Boolean functions
- CO3: Know the basic concepts of VLSI

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1		3										3	
CO2				3									
CO3				3								3	

3 – Substantial, 2 – Moderate, 1 – Slight

**11CS302 OBJECT ORIENTED PROGRAMMING WITH C++**  
(Common to CSE and IT branches)

**3 0 0 3**

**MODULE – I**

**15**

**Introduction to OOP and Basics of C++:** Object oriented programming concepts – objects – classes-methods and messages – abstraction and encapsulation – inheritance – abstract classes – polymorphism.

Introduction to C++ – classes – access specifiers – function and data members – default arguments – function overloading – friend functions – const and volatile functions - static members – Objects – pointers and objects – constant objects – nested classes – local classes - Constructors – default constructor – Parameterized constructors – Constructor with dynamic allocation – copy constructor – destructors.

**MODULE - II**

**15**

**Inheritance and Polymorphism:** Operator overloading – overloading through friend functions – overloading the assignment operator – type conversion – explicit constructor - Inheritance – public, private, and protected derivations – multiple inheritance - virtual base class – abstract class– composite objects - Runtime polymorphism – virtual functions – pure virtual functions – RTTI – typeid – dynamic casting – RTTI and templates – cross casting – down casting.

**MODULE - III**

**15**

**Templates, Exception Handling and Files:** Function and class templates - Exception handling – try-catch-throw paradigm – exception specification – terminate and Unexpected functions – Uncaught exception- Streams and formatted I/O – I/O manipulators - file handling – random access – object serialization – namespaces - std namespace – ANSI String Objects – standard template library

**TOTAL : 45**

**TEXT BOOKS**

1. Trivedi, B., “Programming with ANSI C++”, Oxford University Press, Oxford, 2007.

**REFERENCE BOOKS**

1. Eckel B. and Allison C, “Thinking in C++ volume Two: Practical Programming”, Pearson Education, New Delhi, 2004.
2. Lippman S. B, Lajoie Josee and Moo Barbara E., “C++ Primer”, Fourth Edition, Pearson Education, New Delhi, 2005.
3. Stroustrup B., “The C++ Programming language”, Third edition, Pearson Education, New Delhi, 2004.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Understand the concepts of object oriented programming
- CO2: Write simple programs using files and exception handling
- CO3: Develop simple applications using C++

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1			2										
CO2			2	1								2	
CO3			2									3	2

3 – Substantial, 2 – Moderate, 1 – Slight



**11CS303 COMPUTER ORGANIZATION**  
(Common to CSE and IT branches)

**3 0 0 3**

**MODULE – I**

**15**

**Basic Structure of Computers:** Functional units - Basic operational concepts - Bus structures – Software performance – Memory locations and addresses – Memory operations – Instruction and instruction sequencing – Addressing modes – Assembly language – Basic I/O Operations – Stacks and queues. **Arithmetic Unit:** Addition and subtraction of signed numbers – Design of fast adders – Multiplication of positive numbers - Signed operand multiplication and fast multiplication – Integer Division – Floating point numbers and operations.

**MODULE - II**

**15**

**Basic Processing Unit:** Fundamental concepts – Execution of a complete instruction – Multiple bus organization – Hardwired control – Microprogrammed control - Pipelining – Basic concepts – Data hazards – Instruction hazards – Influence on Instruction sets – Data path and control consideration – Superscalar operation.

**MODULE - III**

**15**

**Memory System:** Basic concepts – Semiconductor RAMs - ROMs – Speed - size and cost – Cache memories - Performance consideration – Virtual memory- Memory Management requirements – Secondary storage. **I/O Organization:** Accessing I/O devices – Interrupts – Direct Memory Access – Buses – Interface Circuits – Standard I/O Interfaces (USB).

**TOTAL : 45**

**TEXT BOOKS**

1. Hamacher, Carl., Vranesic, Zvonko and Zaky, Safwat., “Computer Organization”, Fifth Edition, McGraw Hill, New York, 2002.
2. Hayes, John P., “Computer Architecture and Organization”, Third Edition, Tata McGraw-Hill, New York, 1998.

**REFERENCE BOOKS**

1. Patterson, David A. and Hennessy, John L., “Computer Organization and Design: The Hardware/Software Interface”, Third Edition, Elsevier, Amsterdam, 2005.
2. Stallings, William., “Computer Organization and Architecture: Designing for Performance”, Sixth Edition, Pearson Education, New Delhi, 2003.
3. Heuring, V.P and Jordan, H.F., “Computer Systems Design and Architecture”, Second Edition, Pearson Education, New Delhi, 2004.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Elaborate the basic structure and operation of a digital computer
- CO2: Analyze the concept of pipelining and its associated hazards
- CO3: Distinguish the performance of various memory and I/O management techniques

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	2				2							2	
CO2	2				2							2	
CO3	2				2							2	

3 – Substantial, 2 – Moderate, 1 – Slight

**MODULE – I****15**

**Classification of Signals and Systems :** Continuous time signals (CT signals), discrete time signals (DT signals) - Step, Ramp, Pulse, Impulse, Exponential, Classification of CT and DT signals - periodic and aperiodic, Random signals, CT systems and DT systems, Classification of systems –Linearity-Causality-Time Invariance-Stability-Invertibility and LTI Systems

**MODULE - II****15**

**Analysis of CT and DT signals:** Fourier series analysis, Spectrum of CT signals, Fourier Transform-properties and Laplace Transform – properties- Inverse Laplace Transform -Realization- Direct form I-Direct form II- Cascade-Parallel-transpose structure.

Spectrum of DT Signals, Discrete Time Fourier Transform (DTFT), Z- Transform -Inverse Z Transform –long division method- partial fraction method- residue method-Convolution method- Properties of Z-transform Realization- Direct form I-Direct form II- Cascade-Parallel-transpose structure.

**MODULE - III****15**

**LTI-CT and DT systems:** Differential equation, solution- Representation of CT signals- Block diagram representation, Convolution Integral- Properties-Interconnection of Systems- Impulse Response-Step response, Frequency response, State equations and Matrix.

Differential equations, solution-Representation of DT signals-Block diagram representation, Convolution SUM- Properties-Interconnection of Systems- Impulse Response-Step response – Frequency response, State variable equation and Matrix.

**Lecture : 45, Tutorial : 15, TOTAL : 60****TEXT BOOKS**

- Oppenheim, Alan V., Alan S. Willsky and Nawab, S.Hamid., “Signals and Systems”, Prentice Hall of India, New Delhi, 2003.
- Lindner, K., “Signals and Systems”, McGraw-Hill International, New York, 1999.

**REFERENCE BOOKS**

- Haykin, Simon and Barry Van Veen, “Signals and Systems”, John Wiley & Sons, New York, 1999.
- Hays, Moman H., “Digital Signal Processing”, Schaum’s Outlines, Tata McGraw-Hill, New Delhi, 2004.
- Proakis, John G and Manolakis, Dimitris G, “Digital signal Processing: Principles, Algorithms and Applications”, Third Edition, Prentice Hall of India, New Delhi, 2000.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Understand the basic concepts of signals and systems
- CO2: Analyze the concepts of Fourier series, Fourier transformation, Laplace transform & Z transform and realization in CT & DT

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	2				3								
CO2			3		3								

3 – Substantial, 2 – Moderate, 1 – Slight

**LIST OF EXPERIMENTS /EXERCISES**

1. Program using Pointers and Functions.
2. Program using files.
3. Program using preprocessor.
4. Queue implementation using arrays.
5. Stack implementation using arrays.
6. Singly, doubly and circular linked list implementation and all possible operations on lists.
7. Queue and stack implementation using linked list.
8. Implement the application for checking 'Balanced Paranthesis' using array implementation of Stack ADT.
9. Binary search tree implementation using linked list and possible operations on binary search tree.
10. Heap Sort implementation.
11. Quick Sort implementation.
12. Binary Search implementation.
13. Insertion Sort implementation.
14. Merge Sort implementation.
15. Depth first and breadth first traversal in graphs.

**REFERENCES / MANUALS/SOFTWARE:**

Turbo C++/Borland C++

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Know the advanced concepts in C like files, preprocessor and implement them in C
- CO2: Implement various data structures like stack, queue, singly linked list , doubly linked list , circular linked list as Abstract Data Types
- CO3: Write programs and solve problems using ADTs

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1		3									2		
CO2		3											
CO3		3									2		

3 – Substantial, 2 – Moderate, 1 – Slight

## 11EC304 DIGITAL ELECTRONICS LABORATORY

(Common to ECE, CSE and IT branches)

0 0 3 1

### LIST OF EXPERIMENTS

1. Verification of Boolean theorems using digital logic gates.
2. Design and implementation of combinational circuits using basic gates and universal gates for arbitrary functions.
3. Design and implementation of code converters.
4. Design and implementation of 4-bit binary adder / subtractor using basic gates and MSI devices.
5. Design and implementation of parity generator / checker using basic gates and MSI devices.
6. Design and implementation of magnitude comparator.
7. Design and implementation of Multiplexers and Demultiplexers.
8. Design and implementation of Decoders and Encoders.
9. Verification of operation of flip-flops.
10. Design and implementation of Shift registers in SISO, SIPO, PISO, PIPO modes using suitable IC's.
11. Design and implementation of Synchronous counters.
12. Design and implementation of Asynchronous counters.

### COURSE OUTCOMES

On completion of the course the students will be able to

CO1: Verify Boolean theorems and truth tables of logic gates

CO2: Gain knowledge on design, construction and testing basic digital circuits

CO3: Understand the difference between synchronous and asynchronous logic circuits

### Mapping of Course Outcomes (COs) with Program Outcomes (POs)

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1		2		3								2	
CO2		3		3								3	
CO3		3		3								3	

3 – Substantial, 2 – Moderate, 1 – Slight

**LIST OF EXPERIMENTS /EXERCISES**

1. Design C++ classes with data members and methods using an array.
2. Design C++ classes with static members, methods with default arguments, friend functions.  
(For example, design matrix and vector classes with static allocation, and a friend function to do matrix-vector multiplication)
3. Implement complex number class with necessary operator overloading and type conversions such as integer to complex, double to complex, complex to double etc.
4. Implement Matrix class with dynamic memory allocation and necessary methods.  
Give proper constructor, destructor, copy constructor, and overloading of assignment operator.
5. Overload the new and delete operators to provide custom dynamic allocation of memory.
6. Develop a template for a generic array class with runtime boundary checking. Use overloading of [ ] operator for runtime boundary checking.
7. Develop templates of standard sorting algorithms such as bubble sort, insertion sort.
8. Design stack and queue classes with necessary exception handling.
9. Develop with suitable hierarchy, classes for Point, Shape, Rectangle, Square, Circle, Ellipse, Triangle, Polygon, etc. Design a simple test application to demonstrate dynamic polymorphism and RTTI.
10. Write a C++ program that randomly generates complex numbers (use previously designed Complex class) and writes them two per line in a file along with an operator (+, -, \*, or /). The numbers are written to a file in the format (a + ib). Write another program to read one line at a time from this file, perform the corresponding operation on the two complex numbers read, and write the result to another file (one per line).
11. Design of user-defined manipulator
12. Design a namespace for a class 'counter' which contains variables for upper bound and lower bound.

**REFERENCES / MANUALS/SOFTWARE:**

Linux based C/ C++ compilers

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Write programs in C++ and show the basic differences between C and C++
- CO2: Appreciate the concepts of Object Oriented Programming using C++ and the techniques used to implement them
- CO3: Write programs for Exception Handling, Templates and File Manipulation concepts using C++

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1		3											
CO2		3										2	
CO3		3											

3 – Substantial, 2 – Moderate, 1 – Slight

## 11MA402 PROBABILITY AND QUEUING THEORY

(Common to CSE and IT branches)

3 1 0 4

### MODULE – I

15

**Discrete distributions:** Moment Generating Function – Properties - Binomial distribution - Poisson distribution - Geometric distribution.

**Continuous Distributions:** Uniform distribution – Exponential distribution - Gamma distribution - Normal distribution - Functions of a random variable.

### MODULE - II

15

**Two Dimensional Random Variable:** Joint distributions – Marginal and conditional distributions – Covariance – Correlation and regression – Transformation of random variables.

**Random Process:** Classification of Random Process – Stationary Random Process –Poisson process.

### MODULE - III

15

**Queuing Theory:** Characteristics of a queueing system – Symbolic representation of a queueing model (Kendall's notation) – Characteristics of birth and death (Poisson) process – Queuing model I (single server Poisson queue model) (M/M/1) : ( $\infty$ /FIFO) – Little's formulae –Queuing model II (multiple server Poisson queue model (M/M/C): ( $\infty$ /FIFO) – Queuing model III (Finite capacity, single server Poisson queue model) (M/M/1): (N/FIFO) – Queuing model IV (Finite capacities, multiple server Poisson model) (M/M/C) : (N/ FIFO).

**Lecture : 45, Tutorial : 15, TOTAL : 60**

### TEXT BOOKS

1. Veerarajan., T., “Probability, Statistics and Random Processes”, Second Edition, Tata McGraw-Hill, New Delhi, 2010.
2. Taha, H. A., “Operations Research - An Introduction”, Seventh Edition, Pearson Education Asia, New Delhi, Reprint 2008.

### REFERENCE BOOKS

- 1.. Gross, D., “Fundamentals of Queuing theory”, Second Edition, John Wiley and Sons, New York, 2008.
2. Fruend J E and Miller I, “Probability and Statistics for Engineering”, Eighth Edition Prentice Hall of India, New Delhi, 2010.
3. Gupta S C and Kapoor V K, “Fundamentals of Mathematical Statistics”, Sultan Chand & Sons, New Delhi, 2005.

### COURSE OUTCOMES

On completion of the course the students will be able to

- CO1: Understand the concept of moment generating functions and study various discrete and continuous distributions
- CO2: Know the concepts of two dimensional random variables, correlation, regression and Random process.
- CO3: Identify the Queue disciplines and its applications

### Mapping of Course Outcomes (COs) with Program Outcomes (POs)

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	3				2				1				
CO2	3				2								
CO3	3												

3 – Substantial, 2 – Moderate, 1 – Slight

**MODULE – I****15**

**Java Basics** - Object Oriented Programming Paradigm- Features, Requirements and Design Strategies in OOP- Advantages, limitations and Applications of OOP- Java Platform and Program Structure-JRE- Architecture of JVM- Java Program Structure- Java Versions- J2SE-J2EE-J2ME. Lexical Elements of Java- Operators and Expressions- Control Flow Statements- Arrays – Classifications of arrays- Creation of Regular arrays, reading and writing of arrays - Classes and Objects: Constructors- Access modifiers- methods- Static members- Nested classes- Inheritance: Types- Constructors- Overriding- super- abstract classes- Final Classes and final methods.

**MODULE - II****15**

**I/O, Network and Multithreading:** Dynamic binding- Polymorphism- Advantages of Inheritance- Hierarchical and multilevel Inheritance - Interface and Packages - Exception handling - Strings and Collections - String manipulations – String Tokenizer - Collection Framework - Wrapper classes - Generic data types and collections - Streams and I/O programming – File management- File Processing- Primitive data and object processing - Socket Programming -TCP/IP and UDP socket Programming - Multithreaded Programming- Thread Life cycle - Multiple threads - Thread priority and Methods - Concurrent issues with thread programming.

**MODULE - III****15**

**AWT, Swing and Design Patterns:** Graphical Programming-Handling Events- Swing Components- Advanced Swing Components - MVC design pattern– layout management – Swing Components – Java Applet- Building Non-blocking GUI - Creational pattern: Factory pattern, singleton – Structural pattern: Adapter pattern-Bridge pattern, Composite pattern - Behavioral Pattern: Iterator pattern, Observer pattern.

**TOTAL : 45****TEXT BOOKS**

1. Rajkumar Buyya, Thamarai Selvi, S. and Xingchen Chu, “Object Oriented Programming with Java Essentials and Applications”, Tata McGraw Hill, New Delhi, 2011
2. Cooper, James W, “Java™ Design Patterns”, Addison Wesley, New York, 2006

**REFERENCE BOOKS**

1. Cay S. Horstmann and Gary Cornell, “Core Java: Volume I – Fundamentals”, Eighth Edition, Sun Microsystems Press, 2008.
2. Arnold, K. and Gosling, J., “The JAVA Programming Language”, Third edition, Pearson Education, New Delhi, 2000.
3. Timothy Budd, “Understanding Object-oriented Programming with Java”, Updated Edition, Pearson Education, New Delhi, 2000
4. Thomas Wu, C., “An Introduction to Object-Oriented Programming with Java”, Fourth Edition, Tata McGraw-Hill Publishing company Ltd., New Delhi, 2006.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Understand the fundamentals of object-oriented programming in Java
- CO2: Implement packages and introduce abstraction through interfaces
- CO3: Know the implementation of applets in Web application
- CO4: Apply Java-specific implementation techniques to well-known patterns

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1			2								3		
CO2			2										
CO3			2						1		3	3	2
CO4											3	3	

3 – Substantial, 2 – Moderate, 1 – Slight

# 11CS401 DATABASE MANAGEMENT SYSTEMS

(Common to Mechatronics, EIE,CSE and IT branches)

3 0 0 3

## MODULE – I

15

**Data Models and Normalization:** Introduction – Database System Applications – Purpose of database systems – View of data – Database Languages – Relational Databases – Database Design – Data Storage and Querying – Transaction Management – Database Architecture – Database Users and Administrators- Relational Model – Structure of Relational Databases – Database Schema – Keys – Schema Diagrams – Relational Query Languages - Relational Operations - SQL introduction – Intermediate SQL – Database Design and E-R model – Relational Database Design.

## MODULE - II

15

**Indexing and Transaction Processing:** RAID – File Organization – Organization of Records in Files – Ordered indices – B<sup>+</sup> Tree index files – Static and Dynamic Hashing – Bitmap indices – Index in SQL - Query Processing - Overview – Measures of Query Cost - Sorting – Selection, Join and Other Operations - Transactions - Concurrency control- Lock-based Protocols - Deadlock Handling – Multiple Granularity – Timestamp and Validation Based Protocols -Recovery System- Failure classification – Storage – Recovery and atomicity – Algorithm – Buffer management – Failure with loss of nonvolatile storage – Early lock release and Logical undo operations-ARIES

## MODULE - III

15

**Distributed and Parallel Database:** Centralized and Client-Server Architectures – Server System Architectures – Parallel Systems – Distributed Systems -Parallel Databases – I/O Parallelism – Interquery and Intraquery Parallelism – Interoperation and Intraoperation Parallelism- Distributed Databases- Homogeneous and Heterogeneous Databases – Distributed Data Storage and Transactions – Commit Protocols – Concurrency Control – Availability – Query Processing

**TOTAL : 45**

## TEXT BOOKS

1. Silberschatz, Abraham, Korth, Henry F. and Sudarshan S., “Database System Concepts”, Sixth Edition, McGraw-Hill, New York, 2011.

## REFERENCE BOOKS

1. Elmasri, Ramez and Navathe, Shamkant B., “Fundamental Database Systems”, Fifth Edition, Pearson Education, New Delhi, 2007
2. Kifer Michael, Philip Lewis, Arthur Bernstein and Prabin Panigrahi “Database Systems: An Application-Oriented Approach, Introductory Version”, Second Edition, Pearson Education, New Delhi, 2007.
3. Date C J, Kannan A and Swamynathan S, “An Introduction to Database Systems”, Eighth Edition, Pearson Education, New Delhi, 2006.

## COURSE OUTCOMES

On completion of the course the students will be able to

CO1: Understand the basic concepts of Database Management Systems

CO2: Know various languages that can be used to interact with the database like SQL, MySQL

CO3: Understand how data can be stored as a backend process

CO4: Identify how data can be accessed concurrently under conflicting conditions in a distributed environment

### Mapping of Course Outcomes (COs) with Program Outcomes (POs)

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	2							3					
CO2								3					
CO3	2											2	
CO4								3				2	

3 – Substantial, 2 – Moderate, 1 – Slight



## 11CS402 OPERATING SYSTEMS

(Common to CSE and IT branches)

3 0 0 3

### MODULE - I

15

**Operating System Concepts and CPU Scheduling :** Introduction – Computer System Organization –Operating System Structure-Process Management – Memory Management-Storage Management –Protection and Security- System Calls - Process Concept – Process Scheduling – Operations on Processes – Cooperating Processes – Inter-process Communication- Threads – CPU Scheduling: Scheduling criteria – Scheduling algorithms- Process Synchronization: The critical-section problem – Synchronization hardware – Semaphores – critical regions – Monitors.

### MODULE - II

15

**Deadlock and Memory Management:** Deadlock: System model – Deadlock characterization – Methods for handling deadlocks – Deadlock prevention – Deadlock avoidance – Deadlock detection – Recovery from deadlock. Memory Management: Background – Swapping – Contiguous memory allocation – Paging – Segmentation - Virtual Memory: Background – Demand paging – Page replacement –Thrashing.

### MODULE - III

15

**File System Interface and Mass Storage Structure:** File-System Interface: File concept – Access methods – Directory structure – Protection. File-System Implementation: Directory implementation – Allocation methods – Free-space management – I/O Systems – I/O Hardware – Application I/O interface – Kernel I/O subsystem – streams – Mass-Storage Structure: Disk scheduling –Disk management.

**TOTAL : 45**

### TEXT BOOKS

1. Silberschatz Avi, Peter Baer Galvin, and Greg Gagne., “Operating System Concepts”, Eighth Edition, John Wiley & Sons, Singapore, 2008.
2. Deital, Harvey M., “Operating Systems”, Third Edition, Pearson Education, New Delhi, 2005.

### REFERENCE BOOKS

1. Tanenbaum, Andrew S., “Modern Operating Systems”, Second Edition, Pearson Education, New Delhi, 2004.
2. Gary Nutt., “Operating Systems”, Third Edition, Pearson Education, New Delhi, 2004.
3. Dhamdhare D M, “Operating System: A Concept-Based Approach”, Second Edition, Tata McGraw-Hill, New Delhi, 2006.

### COURSE OUTCOMES

On completion of the course the students will be able to

- CO1: Understand the fundamentals, types, different components of operating systems
- CO2: Know the threading concepts, scheduling, synchronization and deadlock among processes
- CO3: Know memory management techniques like virtual memory, paging and segmentation
- CO4: Acquire knowledge of input/output devices, interfacing of I/O devices and file structure

#### Mapping of Course Outcomes (COs) with Program Outcomes (POs)

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	2		3		2							3	
CO2	2		3		2							3	
CO3	2		2		1							3	
CO4	2		3		2			2				3	

3 – Substantial, 2 – Moderate, 1 – Slight

**11IT402 DESIGN AND ANALYSIS OF ALGORITHMS**  
(Common to CSE and IT)

**3 1 0 4**  
**15**

**MODULE – I**

**Basic Concepts and Mathematical Analysis:** Introduction – notion of algorithm – fundamentals of algorithmic problem solving – important problem types – fundamentals of analysis framework – asymptotic notations and basic efficiency classes – mathematical analysis: non-recursive and recursive algorithms – Fibonacci numbers – Empirical analysis of algorithms – algorithm visualizations.

**MODULE - II**

**Algorithmic Techniques:** Brute force: Selection and Bubble sort, Sequential search and String matching – Divide and Conquer: Merge sort, Quick sort, Binary search, Binary tree, traversals and related properties – Decrease and conquer: Insertion sort, Depth First Search and Breadth First Search – Transform and conquer: Presorting, balanced search trees, AVL trees, Heaps and Heap sort.

**MODULE - III**

**Algorithm Design Methods:** Dynamic Programming: Warshall’s and Floyd’s algorithms, and Optimal Binary Search Trees – Greedy Techniques: Prim’s and Kruskal’s algorithms, Dijkstra’s algorithm and Huffman trees. Backtracking: N-Queens’ problem, Hamiltonian circuit problem and Sum of sub-sets problem – Branch and Bound: Assignment problem, Knapsack problem and Travelling Salesman Problem – Overview of NP problems.

**Lecture : 45, Tutorial : 15, TOTAL : 60**

**TEXT BOOKS**

1. Levitin Anany., ‘Introduction to Design and Analysis of Algorithms’, Second Edition, Pearson Education Asia, Singapore 2007.
2. Jon Kleinberg and Éva Tardos, ‘Algorithm Design’, Pearson Education Asia, Singapore 2008.

**REFERENCE BOOKS**

1. Cormen T.H., Leiserson C.E., Rivest R.L, and Stein C., ‘Introduction to algorithms’, Prentice Hall of India, New Delhi, 2001
2. Aho A.V, Hopcroft J.E., and Ulman J.D., ‘The Design and Analysis of Computer Algorithms’, Pearson Education Asia, Singapore 2003.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Develop problem solving skills based on the fundamentals of the algorithms
- CO2: Acquire knowledge of various algorithmic techniques
- CO3: Deploy the algorithm and analyze and reduce the space and time complexities
- CO4: Know the complexity that might arise during the algorithm deployment

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	3											3	
CO2					3			2				3	
CO3	3				3			2				3	
CO4	3											2	

3 – Substantial, 2 – Moderate, 1 – Slight

**MODULE – I**

**15**

**Amplitude Modulation- Transmission and Reception:** Principles of amplitude modulation – AM envelope, frequency spectrum and bandwidth, modulation index and percentage modulation, AM power distribution, AM modulator circuits – low level AM modulator, AM transmitters – low level transmitters, high level transmitters.

AM reception: AM receivers – TRF, Superheterodyne receivers, Double Conversion AM receivers. (Block Diagrams only)

**Angle Modulation - Transmission:** Angle Modulation – FM and PM waveforms, phase deviation and modulation index, frequency deviation, phase and frequency modulators and demodulators, frequency spectrum of angle modulated waves, Bandwidth requirement, Narrowband FM and Broadband FM, Average power FM and PM modulators – Direct FM and PM, Direct FM transmitter, Indirect FM transmitter, Angle modulation Vs. amplitude modulation.

**MODULE - II**

**15**

**Angle Modulation - Reception:** FM receivers: FM demodulators, PLL FM demodulators, FM noise suppression, Frequency Vs. phase Modulation. (Block Diagrams only)

**Digital Modulation Techniques :** Introduction, Binary PSK, DPSK, QPSK, ASK, Binary FSK, Duobinary encoding – Performance comparison of various systems of Digital Modulation.

**Sampling:** Sampling theorem, Quadrature sampling of bandpass signals, reconstruction of message from its samples, Signal distortion in sampling.

**MODULE - III**

**15**

**Baseband Data Transmission:** Discrete PAM signals, power spectra of Discrete PAM signals, ISI Nyquist Criterion for Distortionless baseband binary transmission, eye pattern, adaptive equalization for data transmission.

**Spread Spectrum and Multiple Access Techniques:** Introduction, Pseudo-noise sequence, DS spread spectrum with coherent binary PSK, Processing gain, FH spread spectrum, multiple access techniques, FDMA, TDMA and CDMA, wireless communication systems, source coding of speech for wireless communications.

**Lecture: 45, Tutorial: 15, TOTAL: 60**

**TEXT BOOKS**

1. Tomasi, Wayne., “Electronic Communication Systems: Fundamentals through Advanced”, Pearson Education, New Delhi, 2001.
2. Haykin, Simon., “Digital Communications”, John Wiley & Sons, New York, 2003.

**REFERENCE BOOKS**

1. Frenzel, Louis E., “Principles of Electronic Communication Systems”, Third Edition, Tata McGraw-Hill, New Delhi, 2008.
2. Haykin, Simon, “Communication Systems”, Fourth Edition, John Wiley & Sons, New York, 2001.
3. Taub and Schilling, “Principles of Communication Systems”, Second Edition, Tata McGraw-Hill, New Delhi, 2003.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Understand different types of AM communication systems
- CO2: Know different types of FM transmitters and receivers
- CO3: Gain basic knowledge in different digital modulation techniques
- CO4: Acquire basic knowledge of base band data transmission and adaptive equalization techniques
- CO5: Know the concept of spread spectrum modulation techniques and different multiple access techniques

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	3												
CO2	3												
CO3	3												
CO4	3												
CO5	3												

3 – Substantial, 2 – Moderate, 1 – Slight

## 11CS404 DATABASE MANAGEMENT SYSTEMS LABORATORY

(Common to CSE and IT)

0 0 3 1

### LIST OF EXPERIMENTS /EXERCISES

1. Implement Data Definition Language (DDL) commands in RDBMS.
2. Implement Data Manipulation Language (DML) and Data Control Language (DCL) commands in RDBMS.
3. Implement all Join operations and Integrity Constraints.
4. Implement High-level language extension with Cursors.
5. Implement High level language extension with Triggers.
6. Implement Procedures and Functions.
7. Implement Embedded SQL.
8. Implement Database design using E-R model and Normalization.
9. Design and implementation of Banking System.
10. Design and implementation of Library Information System.
11. Mini project (Application Development using Oracle/ MYSQL )
  - Inventory Control System.
  - Hospital Management System.
  - Railway Reservation System.
  - Web Based User Identification System.
  - Hotel Management System.
  - Student Information System

### REFERENCES / MANUALS/SOFTWARE:

Front End :Microsoft Visual Studio 6.0, Microsoft .NET Framework SDK v2.0

Back End :ORACLE / SQL SERVER

### COURSE OUTCOMES

On completion of the course the students will be able to

CO1: Implement the PL/SQL commands

CO2: Implement the concepts of embedded query languages

CO3: Understand the interface between backend and frontend tools

### Mapping of Course Outcomes (COs) with Program Outcomes (POs)

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1		3			2							1	
CO2		3											
CO3		3			2							2	

3 – Substantial, 2 – Moderate, 1 – Slight

**11CS406 OPERATING SYSTEMS LABORATORY**  
(Common to CSE and IT)

0 0 3 1

**LIST OF EXPERIMENTS /EXERCISES**

1. Shell programming - command syntax - write simple functions - basic tests.
2. Shell programming - loops- patterns- expansions- substitutions.
3. Write programs using the following system calls of UNIX operating system: fork, exec, getpid, exit, wait, close, stat, opendir, readdir.
4. Write programs using the I/O system calls of UNIX operating system (open, read, write, close, etc)
5. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for FCFS and SJF. For each of the scheduling policies, compute and print the average waiting time and average turnaround time. (2 sessions)
6. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for Priority and Round robin. For each of the scheduling policies, compute and print the average waiting time and average turnaround time. (2 sessions)
7. Developing application using Inter Process communication (using pipes or message queues)
8. Implement the Producer – Consumer problem using semaphores (using UNIX system calls).
9. Implement some memory management schemes – I
10. Implement some memory management schemes – II

**REFERENCES / MANUALS/SOFTWARE:**

1. Linux Operating System
2. C

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Know the basics of Linux and its commands
- CO2: Know how the system calls are implemented using shell script
- CO3: Write programs on scheduling and memory management techniques
- CO4: Write programs for developing inter process communication and semaphores.

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1		3										3	
CO2		3			2							3	
CO3		3			2							3	
CO4		3			2							3	

3 – Substantial, 2 – Moderate, 1 – Slight

**LIST OF EXPERIMENTS /EXERCISES**

1. Develop simple Stack and Queue classes.
2. Design a class for Complex numbers in Java. In addition to methods for basic operations on complex numbers, provide a method to return the number of active objects created.
3. Design a Date class similar to the one provided in the java.util package.
4. Develop with suitable hierarchy, classes for Point, Shape, Rectangle, Square, Circle, Ellipse, Triangle, Polygon, etc. Design a simple test application to demonstrate dynamic polymorphism.
5. Design a Java interface for ADT Stack. Develop two different classes that implement this interface, one using array and the other using linked-list.
6. Write a Java program to read a file that contains DNA sequences of arbitrary length one per line (note that each DNA sequence is just a String). Your program should sort the sequences in descending order with respect to the number of 'TATA' subsequences present. Finally write the sequences in sorted order into another file.
7. Develop a simple paint-like program that can draw basic graphical primitives in different dimensions and colors. Use appropriate menu and buttons.
8. Develop a scientific calculator using event-driven programming paradigm of Java.
9. Develop a template for linked-list class along with its methods in Java.
10. Design a thread-safe implementation of Queue class. Write a multi-threaded Producer-consumer application that uses this Queue class.
11. Write a multi-threaded Java program to print all numbers below 100,000 that are both prime and fibonacci number (some examples are 2, 3, 5, 13, etc.). Design a thread that generates prime numbers below 100,000 and writes them into a pipe. Design another thread that generates fibonacci numbers and writes them to another pipe. The main thread should read both the pipes to identify numbers common to both.
12. Develop a multi-threaded GUI application of your choice.

Note: All Java exercises should implement the following

- Packages
- Exception Handling
- JavaDoc Comments for Documentation.

**REFERENCES / MANUALS/SOFTWARE:**

Java Development Kit

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Write Java programs and understand the differences between fully Object Oriented and Partially object oriented languages
- CO2: Develop event driven programming applications
- CO3: Implement GUI applications using Java
- CO4: Implement Package, Multithreading concepts, Templates and Design Patterns

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1		3										2	
CO2		3											
CO3												3	
CO4		3										2	

3 – Substantial, 2 – Moderate, 1 – Slight

# 11MA501 DISCRETE MATHEMATICS

(Common to CSE and IT branches)

3 1 0 4

## MODULE - I

**Propositional Calculus:** Propositions – Logical connectives – Compound propositions – Conditional and bi conditional propositions – Truth tables – Tautologies and contradictions – Contrapositive – Logical equivalences and implications – DeMorgan’s Laws - Normal forms – Principal conjunctive and disjunctive normal forms – Rules of inference – Arguments - Validity of arguments.

**Predicate Calculus:** Predicates – Statement function – Variables – Free and bound variables – Quantifiers – Universe of discourse – Logical equivalences and implications for quantified statements - Theory of inference – The rules of universal specification and generalization – Validity of arguments.

## MODULE - II

**Set Theory:** Cartesian product of sets – Relations on sets –Types of relations and their properties – Relational matrix and the graph of a relation – Equivalence relations – Partial ordering – Poset – Hasse diagram.

**Lattices:** Definition – Properties – Sublattices – Boolean algebra – Definition – Properties – Simple Problems.

## MODULE - III

**Functions:** Definitions of functions – Classification of functions – Composition of functions – Inverse functions – Characteristic function of a set – Recurrence relation and Generating function.

**Groups:** Groups & Subgroups (Concepts only) - Homomorphism – Cosets and Lagrange’s theorem – Normal subgroups – Codes and group codes – Basic notions of error correction - Error recovery in group codes.

**Lecture : 45, Tutorial : 15, TOTAL : 60**

## TEXT BOOKS

1. Tremblay J.P and Manohar R, “Discrete Mathematical Structures with Applications to Computer Science”, Tata McGraw–Hill, New Delhi, Reprint 2010.
2. Veerarajan T., “Discrete Mathematics with Graph Theory and Combinatorics”, Fourth Edition, Tata McGraw-Hill, New Delhi, 2008.

## REFERENCE BOOKS

1. Kolman, Bernard., Busby, Robert C., and Ross, Sharan Cutler, “Discrete Mathematical Structures”, Pearson Education, New Delhi, 2003.
2. Venkatraman M.K., “Discrete Mathematics”, The National Publishing Company, Chennai, 2007.
3. Doerr Alan, and Kenneth Levassaur, “Applied Discrete Structures for Computer Science”, Galgotia Publications Pvt., Ltd., New Delhi, 1998.
4. Judith L.Gersting, “Mathematical Structures for Computer Science”, W.H.Freeman and Company, New York, Fifth Edition, 2006.

## COURSE OUTCOMES

On completion of the course the students will be able to

- CO1: Understand the concepts of logic and their applications
- CO2: Appreciate the importance of set theory and study the concept of lattices.
- CO3: Know various types of functions, analyze the concepts of groups and their applications

### Mapping of Course Outcomes (COs) with Program Outcomes (POs)

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1									1				
CO2	2				2								
CO3	2												

3 – Substantial, 2 – Moderate, 1 – Slight

**MODULE – I****15**

**2D Primitives & 3D Concepts:** Output primitives: Line, Circle and Ellipse drawing algorithms, Filled Area primitives - Attributes of output primitives – Two dimensional geometric transformations - Two dimensional viewing – Clipping operations: Point, Line, Polygon, Curve and Text clipping algorithms. Parallel and Perspective projections - Three dimensional object representation : Polygons, Curved lines, Splines, Quadric Surfaces, Bezier curves and surfaces – Fractal Geometry methods – Visualization of data sets - 3D transformations – Viewing - Visible surface identification.

**Graphics Programming:** Color Models – RGB, YIQ, CMY, HSV - Animations – General computer Animation, Raster, Key frame - Graphics programming using OpenGL – Basic graphics primitives – Drawing three dimensional objects - Drawing three dimensional scenes.

**MODULE – II****15**

**Multimedia:** Introduction, Information Representation, Multimedia Networks, Applications, Networking Terminology, Multimedia Information Representation – Digitization principles, Text, Images, Audio, Video

**Compression Techniques:** Compression principles, Text compression, Image compression, Audio compression and Video compression

**MODULE – III****15**

**Multimedia Operating Systems:** Real time, Resource management, Process management, File systems, Additional operating system issues, System architecture

**Multimedia Database Systems:** Characteristics of an MDBMS, Data analysis, Data structure, Operations on data, Integration in a database model

**TOTAL : 45****TEXT BOOKS**

1. Hearn, Donald and Baker, M.Pauline., “Computer Graphics: C Version”, Second Edition, Pearson Education, 2004.
2. Halshall, Fred., “Multimedia Communications”, Pearson Education (India), New Delhi, 2002.

**REFERENCE BOOKS**

1. Steinmetz, Ralf and Nahrstedt, Klara., “Multimedia: Computing, Communications and Applications”, Pearson Education, New Delhi, 2001.
2. Andleigh, Prabat K, and Thakrar Kiran., “Multimedia Systems and Design”, Prentice Hall of India, New Delhi, 2003.
3. Ashok Banerji, Ananda Ghosh, “Multimedia Technologies”, Tata McGraw-Hill, New Delhi, 2009.
4. Parekh, R., “Principles of Multimedia” Tata McGraw-Hill, New Delhi, 2006.

**COURSE OUTCOMES**

On completion of the course the students will be able to

CO1: Know the basic Output Primitives

CO2: Understand what is Multimedia and its applications and Information Representation of Multimedia data

CO3: Analyze the various compression and decompression algorithms for multimedia data

CO4: Acquire basic skills in Multimedia Operating System and maintenance of Multimedia Databases

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1			3									2	
CO2												2	3
CO3			3									2	3
CO4			3										3

3 – Substantial, 2 – Moderate, 1 – Slight



**11IT502 COMPUTER COMMUNICATION NETWORKS**  
(Common to Mechatronics, ECE and IT branches)

**3 0 0 3**  
**15**

**MODULE – I**

**Introduction to Data Communications and Physical Layer:** Components and representations– Data flow – Networks – Criteria, physical structures and categories – Topologies –Protocols and standards – ISO / OSI model- Line coding – Line coding schemes – Transmission Modes - Transmission Media –Guided media -Twisted-pair- Coaxial Cable – Fiber Optics

**Data Link Layer -Flow Control and Error Control:** CRC – Check sum - Stop and wait – Go back-N - ARQ – Selective repeat ARQ- Sliding window – HDLC – Point-to-Point protocol

**MODULE – II**

**15**

**Data Link Layer -Local Area Network(LAN):** Wired LAN – Ethernet- IEEE Standards - IEEE 802.3 - IEEE 802.4 - IEEE 802.5 - Fast Ethernet- Gigabit Ethernet- IEEE 802.11

**Network Layer:** Inter-networks – IPV4 and IPV6 addressing methods – IPV4 –IPV6 – ARP - RARP – ICMP – Forwarding and routing - Unicast routing protocols – Intra and inter-domain routing - Distance vector routing – Link state routing – Path vector routing- VLAN

**MODULE – III**

**15**

**Transport Layer:** Process-to-process delivery - UDP - TCP – Congestion Control – Quality of Services (QoS) – Techniques to improve QoS - Integrated Services- Differentiated service.

**Application Layer:** Domain Name Space (DNS) – Distribution of name space- DNS in the Internet- Resolution- Remote logging –Electronic Mail- File transfer- HTTP - WWW - SNMP

**TOTAL : 45**

**TEXT BOOKS**

- Forouzan, Behrouz A., “Data communication and Networking”, Fourth Edition, Tata McGraw-Hill, New Delhi, 2006.
- Peterson, Larry L. and Davie, Peter S., “Computer Networks”, Second Edition, Harcourt Asia, Singapore, 2000.

**REFERENCE BOOKS**

- Kurose, James F. and Ross, Keith W., “Computer Networking: A Top-Down Approach Featuring the Internet”, Pearson Education, New Delhi, 2003.
- Tanenbaum, Andrew S., “Computer Networks”, Fourth Edition, Prentice Hall of India, New Delhi, 2003.
- Stallings, William., “Data and Computer Communication”, Sixth Edition, Pearson Education, New Delhi, 2000.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Understand the basic concepts of Networking
- CO2: Acquire knowledge in layered architecture and its need in networking
- CO3: Identify the need for IEEE standards and its types
- CO4: Know the various network components and topologies
- CO5: Understand QoS and different QoS parameters

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	3		3		3			3			2	3	2
CO2	2		3		3			2			2	3	2
CO3			3								2	3	1
CO4	2		3		2			2				3	1
CO5	3		3		3			2			2	3	2

3 – Substantial, 2 – Moderate, 1 – Slight

**11CS304 SOFTWARE ENGINEERING**  
(Common to EIE, CSE and IT branches)

**3 0 0 3**

**MODULE - I**

**15**

**Process Models and Requirement Analysis:** A Generic view of processes – Process models: Waterfall models, Incremental models, Evolutionary models, Specialized models – Agile process and models – System engineering, Requirement engineering: Tasks, Initiating the process, Eliciting requirements, Developing use cases – Negotiating requirements – Validating requirements – Building the analysis models: Concepts – Object oriented analysis – Scenario based modeling – Data & Control flow oriented model – Class based model – Behavioural model.

**MODULE - II**

**15**

**Software Design:** Design concepts – Design models – Pattern based design – Pattern analysis and design – Pattern catalogs – Architectural design – Architectural styles – Component level design – Class based and conventional components design – Real-time system design – User interface design – Human computer interface design- Object-oriented design: Objects and object classes, An object oriented design process, Design evolution.

**MODULE - III**

**15**

**Software Testing and Software Project Management:** Software testing – Strategies – Issues – Test strategies for conventional and object oriented software – Validation and system testing – Debugging - Testing tactics: White box testing, Basis path testing – Control structure testing – Black box testing - Object oriented testing – Testing GUI – Testing client/server – Test documentation – Estimation - Project scheduling - Risk management - Change management.

**TOTAL : 45**

**TEXT BOOKS**

1. Pressman, Roger S., “Software Engineering: A Practitioner’s Approach”, Sixth Edition, McGraw-Hill, New York, 2008.
2. Sommerville, I, “Software Engineering”, Eighth Edition, Addison Wesley, New York, 2008.

**REFERENCE BOOKS**

1. Jalote, Pankaj, “An Integrated Approach to Software Engineering”, Third edition, Narosa Publishing House, New Delhi, 2008.
2. Ghezzi, Et al, “Fundamental of Software Engineering”, Second Edition, Prentice Hall of India, New Delhi, 2009.
3. SWEBOK, “Guide to the Software Engineering Body of Knowledge”, A project of the IEEE Computer Society Professional Practices Committee, 2004.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Understand basic software engineering life cycle models
- CO2: Gain knowledge in software engineering development activities
- CO3: Examine basic methodologies for specification, design, interfaces development, testing and project management

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	3												3
CO2			3										
CO3	3		3										3

3 – Substantial, 2 – Moderate, 1 – Slight

**MODLUE - I**

**FIR & IIR FILTER DESIGN**

**FIR Filter Design:** Amplitude and phase responses of FIR filters – Linear phase filters – symmetrical linear phase filter, asymmetrical linear phase filter - windowing techniques for the design of Linear phase FIR filters – Rectangular, Hamming, Hanning, Blackman and Kaiser windows – Design using frequency sampling technique - Realization of FIR filters – Transversal, Linear phase and Polyphase realization structures. **IIR Filter Design:** Review of design of analogue Butterworth and Chebychev Filters, Frequency transformation in analog domain – Design of IIR digital filters using impulse invariance technique – Design of IIR digital filters using bilinear transformation – pre warping – Frequency transformation in digital domain

**MODLUE - II**

**15**

**Effects of Finite Word Length and FFT:** Quantization noise – derivation for quantization noise power – Binary fixed point and floating point number representations – Comparison – truncation and rounding error – input quantization error-coefficient quantization error – limit cycle oscillations- Overflow error-signal scaling - Review of DFT – Efficient computation of DFT- Properties of DFT – FFT algorithms – Radix-2 FFT algorithms – Decimation in Time – Decimation in Frequency algorithms –Use of FFT algorithms in Linear Filtering and correlation

**MODLUE - III**

**15**

**DSP Processor and its Implementation:** Introduction to programmable DSPs – need for DSP processor – features of DSP processor – MAC – modified bus architectures – memory access scheme – multiple access memory – multiported memory – VLIW architecture – pipelining – special addressing modes – on chip peripherals. TMS320C54X – Architecture of C54X – C54X buses – memory organization- CPU – ALU – Barrel shifter – multiplier / adder unit – DAGEN – PAGEN – instruction set – application programs – implementation.

**Lecture : 45, Tutorial : 15, TOTAL : 60**

**TEXT BOOKS**

1. Oppenheim, Alan V. and Schaffer, Ronald., “Digital Signal Processing”, Prentice Hall of India Pvt. Ltd., New Delhi, 2008.
2. Venkataramani. B and Bhaskar M., “Digital Signal Processor Architecture, Programming and Application”, Tata McGraw-Hill, New Delhi, 2002.

**REFERENCE BOOKS**

1. Proakis John G and Manolakis Dimtris G., “Digital Signal Processing: Principles, Algorithms and Application”, Fourth Edition, Prentice Hall of India, New Delhi, 2007.
2. Mitra S.K., “Digital Signal Processing: A Computer Based Approach”, Tata McGraw-Hill, New Delhi, 1998.
3. Avtar Singh and Srinivasan S, “DSP Implementation using DSP Microprocessor with Examples from TMS32C54XX”, Thomson / Brooks cole Publishers, Singapore, 2003.
4. Poornachandra S, and Sasikala B, “Digital Signal Processing”, Second Edition, Tata McGraw-Hill, New Delhi, 2008.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Obtain knowledge on frequency domain analysis of discrete time signals
- CO2: Design digital filters using DSP processors
- CO3: Understand the effects of word length in the design of digital filters

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1			3		3								
CO2					3								
CO3			3										

3 – Substantial, 2 – Moderate, 1 – Slight

## 11EC509 MICROPROCESSORS AND INTERFACING

3 1 0 4

### MODULE - I

15

**8 Bit Microprocessor Architecture:** 8085 Architecture – Functional block diagram –Bus architecture- Instruction set – Addressing modes – Timing diagrams – Read operation- Write operation - – Assembly language programming-simple programs – Interrupts- Memory Interfacing, I/O Interfacing : Memory mapped I/O, I/O Mapped I/O – Time delay calculations

### MODULE - II

15

**16 Bit Microprocessor Architecture:** Register organization of 8086 – Architecture - Physical Memory organization - I/O addressing capability - Addressing modes of 8086 - Instruction set of 8086: Data transfer instructions- String instructions- Logical Instructions- Arithmetic Instructions -Transfer of control instructions -Processor control Instructions. Special Processor Activities : Maximum mode CPU Module - Minimum mode CPU module. Assembly language programming-Programming with an assembler - Assembly language example programs. Introduction to stack - Interrupt and Interrupt service routines-interrupt cycles-interrupt programming-memory interfacing- Assembler Directives and operators- Time Delays using counter

### MODULE - III

15

**Peripheral Interfacing:** External memory Interfacing and I/O interfacing - Block diagram-Modes of operation- Simple programs: Parallel communication interface(8255) - Serial communication interface (8251)– Keyboard /display controller (8279)– Programmable timer / external event counter (8254) –Programming and applications.

**Lecture: 45, Tutorial: 15, TOTAL : 60**

### TEXT BOOKS

1. Gaonkar R.S., “Microprocessor Architecture, Programming, and Applications with the 8085”, Fifth Edition, Prentice Hall, New Jersey, 2007.
2. Ray K., and Bhurchandi K. M., “Advanced Microprocessors and Peripherals – Architecture, Programming and Interface”, Tata McGraw Hill, sixteenth reprint, 2000.

### REFERENCE BOOKS

1. Hall, Douglas V., “Microprocessors and Interfacing Programming and Hardware”, Tata McGraw Hill, 2005.
2. Ayala, Kenneth J., “The 8051 Microcontroller Architecture Programming and Application”, Second Edition, Penram International Publishers (India), New Delhi, 2007.
3. Uffenbeck John., “The 80x86 Family, Design, Programming and Interfacing”, Third Edition. Pearson Education, 2002.

### COURSE OUTCOMES

On completion of the course the students will be able to

- CO1: Understand the basic concepts of 16-bit microprocessor
- CO2: Gain exposure on 8 bit microcontroller with different interfacing techniques
- CO3: Design a basic microcontroller based systems

#### Mapping of Course Outcomes (COs) with Program Outcomes (POs)

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	3		3	3								3	
CO2			3									3	
CO3				3								3	

3 – Substantial, 2 – Moderate, 1 – Slight

**LIST OF EXPERIMENTS**

1. Programming for 8/16 bit Arithmetic and logical operations using 8085 /8086 Microprocessors
  - Addition / subtraction / multiplication / division.
2. Programming with control instructions using 8085 / 8086 Microprocessors
  - Hex. / ASCII / BCD code conversions
3. Programming with control instructions using 8085 / 8086 Microprocessors
  - Ascending / Descending order
  - Maximum / Minimum of numbers.
4. Programming with control instructions using 8085 / 8086 Microprocessors
  - Matrix multiplication
  - Searching
5. Programming of 8255 PPI IC using 8085 / 8086 Microprocessors
6. Programming of 8279 Keyboard/Display IC using 8085 / 8086 Microprocessors
7. Programming of 8251 Serial Communication IC using 8085 / 8086 Microprocessors
8. Interfacing with Data converter using 8085 /8086 - A/D Interfacing.
9. Interfacing with Data converter using 8085 /8086 - D/A Interfacing.
10. Interfacing with motors using 8085 / 8086 - Stepper motor control

**REFERENCES / MANUALS/SOFTWARE**

8085 Simulator

8085/8086 Microprocessor Kits

**COURSE OUTCOMES**

On completion of the course the students will be able to

CO1: Gain knowledge in assembly language

CO2: Understand the functionalities of 8085 and 8086 microprocessor

CO3: interface I/O devices with micro processor

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1		2		3								3	
CO2		2		3								3	
CO3		2		3								3	

3 – Substantial, 2 – Moderate, 1 – Slight

**LIST OF EXPERIMENTS****COMMUNICATION LAB EXPERIMENTS**

1. Generation and detection of Amplitude Modulation
2. Generation and detection of Frequency Modulation
3. Generation and detection of PAM
4. Generation and detection of BFSK
5. Pseudo Random Noise sequence generation with digital ICs

**DSP LAB EXPERIMENTS (USING MATLAB)**

1. Generation of Discrete and Analog Signals
2. Verification of Sampling Theorem
3. Finding Response of LTI systems
4. Finding FFT and IFFT
5. Linear and Circular Convolution through FFT
6. Design of FIR filters
7. Design of IIR filters

**REFERENCES / MANUALS/SOFTWARE**

MATLAB 7.1

**COURSE OUTCOMES**

On completion of the course the students will be able to

CO1: Implement programs on DSP using MATLAB software

CO2: Design modulation circuits and demodulation circuits

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1		3	3									3	
CO2		3	3									3	

3 – Substantial, 2 – Moderate, 1 – Slight

**11EL202 COMMUNICATION SKILLS LABORATORY**  
(Common to all Engineering and Technology branches)

0 0 3 1

**LIST OF EXPERIMENTS**

**English Lab**

1. Listening Comprehension  
Listening to instructional software packages in the communication laboratory, using them, understanding the mechanics of language like grammar, listening to native speakers' presentation, developing oral communication by imitating the model dialogues. Listening for specific information – listening to improve pronunciation – Listening and typing – Filling the blanks – TV programmes and News.
2. Reading comprehension and vocabulary:  
Reading for getting information and understanding; scanning, skimming and identifying topic sentences – reading for gaining knowledge, looking for transitions, understanding the attitude of the writer – Filling the blanks – Cloze exercises – vocabulary building – Comprehension.
3. Speaking:  
Group discussion; verbal and non-verbal communication; speaking on situational topics – maintaining eye contact, speaking audibly, clearly and with confidence – Common errors in English  
Conversations – face-to-Face conversation – Telephone Conversation – Roll play.
4. Writing Skills:  
Writing job application: resume, applications for jobs, making complaint letters – Projects: report writing – editing and proof reading – research paper and translating numerical data from charts and diagrams into verbal communication.

**Career Lab**

1. Letter Writing / Resume / Report preparation:  
Structuring Letter Writing / Resume / Report preparation / E-Mail
2. Presentation skills  
Elements and structure effective presentation – presentation tools – voice Modulation – Body language – Video samples
3. Group Discussion  
Structure of Group Discussion – Strategies in GD – Team work – Video Samples
4. Interview skills  
Kinds of Interview- corporate culture – video samples
5. Soft Skills  
Time management – stress management – assertiveness – case study

**REFERENCES / MANUALS/SOFTWARE**

1. Young India Software
  - a. Tense Buster Intermediate
  - b. Issues in English
2. Globarena – English Lab / Career Lab Software

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Communicate without grammatical errors  
CO2: Communicate effectively in good accent  
CO3: Know the method of presentation  
CO4: Communicate without grammatical errors

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1				2			3			2			
CO2				2			3		2				
CO3				2			3						
CO4				2			3		2	2			

3 – Substantial, 2 – Moderate, 1 – Slight

## 11MA401 NUMERICAL METHODS

(Common to all Engineering and Technology branches except ECE & CSE)

3 1 0 4

### MODULE - I

15

**Linear Algebraic Equations:** Method of false position - Newton's method - Solution of linear system of equations by Gaussian elimination and Gauss - Jordan methods – Iterative methods: Gauss Jacobi and Gauss – Seidel methods.

**Interpolation:** Newton's forward and backward difference formulae – Bessel's formula - Lagrange's interpolation formula - Newton's divided difference formula.

### MODULE - II

15

**Numerical Differentiation:** Differentiation Using Newton's forward, backward and divided difference interpolation formula - Single step Methods - Taylor Series, Euler and Modified Euler methods - Fourth order Runge-Kutta method for solving first order equations - Multistep methods – Milne's and Adam's predictor and corrector methods.

**Numerical Integration:** Trapezoidal rule – Simpson's 1/3 – Double integrals using Trapezoidal and Simpson's rules.

### MODULE - III

15

**Boundary Value Problems in PDE:** Finite difference approximations to partial derivatives - Two dimensional Laplace equations - Poisson equations – One dimensional heat equation by implicit and explicit methods – One dimensional wave equation.

**Lecturer: 45, Tutorial: 15, TOTAL: 60**

### TEXT BOOKS

1. Kandasamy, P., Thilakavathy, K. and Gunavathy, K., "Numerical Methods", S.Chand & Co, New Delhi, reprint 2010.
2. Venkatraman, M. K., "Numerical Methods", National Publishing Company, Chennai, 2000.

### REFERENCE BOOKS

1. Balagurusamy, E., "Numerical Methods", Tata McGraw-Hill, New Delhi, 1999.
2. Jain, M. K., Iyengar, S. R. K. and Jain, R. K., "Numerical Methods for Scientific and Engineering Computation", Fourth Edition, New Age International (P) Ltd., New Delhi, 2006.
3. Sankara Rao, K., "Numerical Methods for Scientists and Engineers", Second Edition, Prentice Hall India, New Delhi, 2004.
4. Thangaraj, P., "Computer – Oriented Numerical Methods", Prentice Hall of India, New Delhi, 2008.

### COURSE OUTCOMES

On completion of the course the students will be able to

- CO1: Know the various methods of solving algebraic and transcendental equations numerically
- CO2: Understand the concepts of interpolation techniques
- CO3: Understand the concepts of numerical differentiation and integration
- CO4: Know the methods of solving boundary value problems and initial value problems

### Mapping of Course Outcomes (COs) with Program Outcomes (POs)

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	3												
CO2	3	2			1				1				
CO3	3		1										1
CO4	3												1

3 – Substantial, 2 – Moderate, 1 – Slight



## 11GE601 ECONOMICS AND MANAGEMENT FOR ENGINEERS

(Common to all Engineering and Technology branches)

3 0 0 3

### MODULE – I

15

Economics – Basics Concepts and Principles – Demand and Supply – Law of demand – Determinants of demand, Law of supply – market Equilibrium – National Income – Circular Flow of Economic activities and Income –National Income and its measurement techniques – Inflation – Causes of Inflation – Controlling Inflation –Business Cycle .

### MODULE – II

15

Forms of business – Management Functions: Planning, Organizing, Staffing, Leading and Controlling- Managerial Skills - Levels of Management - Roles of manager.  
Marketing – Core Concepts of Marketing, Four P’s of Marketing, New product development, Product Life Cycle, Pricing Strategies and Decisions. Operations Management – Resources – Site selection, Plant Layout, Steps in Production Planning and Control – EOQ Determination

### MODULE – III

15

Accounting Principles – Financial Statements and its uses – Time value of Money – Depreciation methods — Break Even Analysis – Capital budgeting techniques – Introduction to FDI, FII, Mergers & Acquisition.

**TOTAL : 45**

### TEXT BOOKS

1. Geetika, Plyali Ghosh, Purba Roy Choudhury, “Managerial Economics”, 1<sup>st</sup> Edition, Tata McGraw-Hill, New Delhi, 2008.
2. Jeff Madura, “Fundamentals of Business”, Cengage Learning Inc, India, 2007.

### REFERENCE BOOKS

1. Stanley L. Brue and Campbell R McConnell, “Essentials of Economics”, Tata McGraw-Hill, New Delhi, 2007.
2. S.P.Jain, K.L.Narang, Simi Agrawal, “Accounting for Management”, First Edition, Tata McGraw-Hill, New Delhi, 2009

### COURSE OUTCOMES

On completion of the course the students will be able to

- CO1: estimate market equilibrium and interpret national income calculation and inflation issues
- CO2: categorize the forms of business and analyse the functions of management
- CO3: appraise marketing and operations management decisions
- CO4: interpret financial and accounting statements

### Mapping of Course Outcomes (COs) with Program Outcomes (POs)

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	2									2			3
CO2						2		3		2		2	3
CO3		1						3		2		2	3
CO4	2												3

3 – Substantial, 2 – Moderate, 1 – Slight

**MODULE - I****15**

**Elementary TCP Sockets:** Introduction to socket programming – Overview of TCP/IP protocols –Introduction to sockets – Socket address structure – Byte ordering functions – Byte manipulation functions - Address conversion functions – Elementary TCP sockets – socket, connect, bind, listen, accept, read, write, close functions –Server – Concurrent Server.

**Application Development:** TCP Client-Server : TCP Echo server – TCP Echo client – Normal startup – Normal termination- Posix signal handling – Handling SIGCHLD signals – wait and waitpid functions –Boundary conditions: Termination of server process –SIGPIPE signal – Crashing of server host – Crashing and rebooting of server host- Shutdown of server host

**MODULE - II****15**

**I/O Multiplexing and Socket Options:** I/O Models – Select function – Shutdown function – TCP echo server (with multiplexing) – Poll function – TCP echo client (with Multiplexing)-Socket options: getsocket and setsocket functions – generic socket options – IPv4 socket options – ICMP socket options –IPv6 Socket options - TCP socket options.

**Elementary UDP Sockets and Advanced Sockets:** Elementary UDP sockets: UDP echo Server – UDP echo Client – Multiplexing TCP and UDP sockets – Domain name system – gethostbyname function – IPV6 support in DNS – gethostbyaddr function – uname function – gethostname function- getservbyname and getservbyport functions - IPV4 and IPV6 interoperability – Threads : Threaded servers - thread creation and termination – TCP echo server using threads – Mutexes – condition variables.

**MODULE - III****15**

**Raw Sockets:** Raw socket creation –Raw socket output – Raw socket input – Ping program – Trace route program.

**Simple Network Management:** SNMP Network management Concepts – SNMP management information – Standard MIB's – SNMPv1 protocol and practical issues – Introduction to RMON, SNMPv2 and SNMPv3.

**TOTAL : 45****TEXT BOOKS**

1. Stevens, W. Richard, "Unix Network Programming Volume - I", Second Edition, PHI/Pearson Education, 1998.
2. Stallings, William, "SNMP, SNMPv2, SNMPv3 and RMON 1 and 2", Third Edition, Addison Wesley, 1999.

**REFERENCE BOOK**

1. Comer, D.E., "Internetworking with TCP/IP Volume - III", (BSD Sockets Version), Second Edition, Prentice Hall of India, New Delhi, 2003.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Know the basics of Socket Programming using TCP and UDP and manipulate the socket functions
- CO2: Analyse various techniques to deploy high end scalable applications
- CO3: Acquire knowledge in raw sockets and its operations
- CO4: Gain basic knowledge of SNMP protocols, standard MIBs and RMON

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1			3		3							3	
CO2			3		2							3	
CO3			3		2							3	
CO4			3		3							3	

3 – Substantial, 2 – Moderate, 1 – Slight

**MODULE - I**

**15**

**Architectures:** Introduction to Distributed System – Goals – Types of distributed system, Architectural styles, System architecture – Architecture Vs Middleware – Self Management in distributed system - Threads – Virtualization – Clients – Servers – Code migration.

**Communication and Naming:** Remote procedure call – Message oriented communication – Stream oriented communication-Multicast Communication – Names, identifiers and addresses – Flat, structured and attribute – based naming

**MODULE - II**

**15**

**Synchronization:** Clock synchronization – Logical clocks – Lamport – vector clocks – Token based and non-token based algorithms – Ricart – Agrawala Algorithms. Distributed deadlock detection - Agreement protocols- Consistency and replication: Data centric and client centric consistency models – Replica Management, Consistency protocols.

**Distributed Resource Management:** Distributed file system – Architecture, Mechanisms for building distributed file system – Design issues – Case studies: Sun NFS, Sprite, Apollo DOMAIN Coda, x-Kernel logical file Systems-Log structured file systems – Distributed shared Memory – Architecture and motivation – Algorithms for implementing distributed shared memory, Memory coherence, Coherence protocols – Design issues – Case studies: Ivy, mirage and clouds

**MODULE - III**

**15**

**Fault Tolerance:** Issues – Atomic actions and committing – Commit protocols – Non blocking commit protocols – Voting and dynamic voting protocols –Majority based dynamic and dynamic vote reassignment protocols – Failure resilient processes – Reliable communication – Fault tolerance under Unix.

**Distributed Object-Based, Web-Based and Co-Ordination Based Systems:** Architecture – Processes – Communication – Naming – Synchronization – Consistency and Replication, Fault tolerance and security in distributed web based, object based and co-ordination based systems

**TOTAL: 45**

**TEXT BOOKS**

1. Tanenbaum Andrew S., and Maarten Van Steen, “Distributed Systems: Principles and paradigms”, Second Edition, Prentice Hall of India, New Delhi, 2008.
2. Singhal Mukesh, and Shivaratri Niranjana G., “Advanced Concepts in Operating Systems”, Tata McGraw-Hill Publishing Co.Ltd. New Delhi, 2001.

**REFERENCE BOOKS**

1. Coulouris George, Dollimore Jean, and Kindberg Tim, “Distributed Systems: Concepts and Design”, Third Edition, Pearson Education Asia, 2002
2. Liu M.L, “Distributed Computing: Principles and Applications”, Pearson Addison Wesley, 2004

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Know the basic concepts, architecture and virtualization in distributed systems
- CO2: Implement various processes and architectures in distributed system using synchronization
- CO3: Understand the concepts of Fault tolerance and data replications
- CO4: Develop Distributed applications in Object-Based, Web – Based and Co-ordination based systems

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	2							3				3	
CO2	3				3							3	
CO3								3				3	
CO4	3				3							3	

3 – Substantial, 2 – Moderate, 1 – Slight

## 11IT603 OBJECT ORIENTED SYSTEM DEVELOPMENT

3 0 0 3

### MODULE - I

15

**Introduction:** An overview of object oriented systems development - Object basics – Object oriented systems development life cycle.

**Object Oriented Methodologies:** Rumbaugh methodology - Booch methodology - Jacobson methodology - Patterns – Frameworks – Unified approach – Unified modeling language – Use case - Class diagram - Interactive diagram - Package diagram - Collaboration diagram – State chart diagram - Activity diagram

### MODULE - II

15

**Object Oriented Analysis:** Identifying use cases - Object analysis - Classification – Identifying object relationships, Attributes and methods.

**Object Oriented Design:** Design axioms - Designing Classes – Access layer: Object storage, Object interoperability.

### MODULE - III

15

**View Layer:** Designing interface objects-Macro-level, Micro-level process-Purpose of view layer interface- Prototyping the user interface

**Software Quality and Usability:** Software quality assurance – System usability and measuring user satisfaction

**TOTAL : 45**

### TEXT BOOKS

1. Ali Bahrami, “Object Oriented Systems Development”, Tata McGraw-Hill, 2008.
2. Booch, Grady., Rumbaugh, James and Jacobson, Ivar., “The Unified Modeling Language User Guide”, Second Edition, Addison Wesley, , 2005.

### REFERENCE BOOKS

1. Bernd Bruegge, Allen Dutoit: “Object-Oriented Software Engineering: Using UML, Patterns, and Java”, Prentice Hall, Third edition, 2009.
2. Pressman, Roger S., “Software Engineering: A Practitioner’s Approach”, Sixth Edition, McGraw-Hill, New York, 2005.
3. Sommerville, I, “Software Engineering”, Sixth Edition, Addison Wesley, New York, 2005.

### COURSE OUTCOMES

On completion of the course the students will be able to

- CO1: Know the basic concepts of Object oriented life cycle
- CO2: Identify objects, relationships, services and attributes using various methodologies and approaches through UML
- CO3: Draw the Use case diagrams and understand the Object oriented design process
- CO4: Understand object oriented designs and axioms in the Access layer
- CO5: Gain basic knowledge on quality of the software

#### Mapping of Course Outcomes (COs) with Program Outcomes (POs)

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1			3	2									
CO2			3									1	
CO3			3									1	
CO4			3	2									
CO5			3									1	

3 – Substantial, 2 – Moderate, 1 – Slight

**11IT604 NETWORK LABORATORY**  
(Common to CSE and IT branches)

0 0 3 1

**LIST OF EXPERIMENTS**

1. Write a program that takes a binary file as input and performs bit stuffing.
2. Write a program that takes a binary file as input and performs CRC Computation.
3. Simulation of ARP.
4. Simulation of RARP
5. Develop a Client – Server application for chat.
6. Develop a Client that contacts a given DNS Server to resolve a given hostname.
7. Write a Client to download a file from a HTTP Server.
8. Simulation of Sliding-Window protocol.
9. Simulation of OSPF routing protocol.
10. Simulation of BGP routing protocol.
11. Simulation of nodes with UDP agents using NS2
12. Simulation of nodes with UDP agents using GloMoSim

**REFERENCES / MANUALS/SOFTWARE**

1. Linux Operating System
2. C Compiler, NS2, GloMoSim

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Understand the functionalities of networking components
- CO2: Implement layer 2 functionalities like bit stuffing and error detection
- CO3: Demonstrate layer 3 functionalities of routing and address resolution
- CO4: Develop higher layer functionalities like congestion control, file downloading and chatting

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1		3										3	
CO2		3			2							3	
CO3		3										3	
CO4		3			2							3	

3 – Substantial, 2 – Moderate, 1 – Slight

**LIST OF EXPERIMENTS**

1. To create virtual server in a host operating system
2. To create an application to demonstrate thread synchronization
3. To create an application to simulate deadlock
4. To create Producer-Consumer application for sharing memory
5. To create a client server application using TCP sockets
6. To create a client server application using UDP sockets
7. To create a multicast group for receiving messages using IP Multicasting
8. To create a simple RMI application for downloading files
9. To create a simple RMI application for publishing results
10. To create a session bean for banking operations using JNDI
11. To create a session bean for Library operations using JNDI
12. To develop an ORB application for share market information
13. To develop an ORB application for weather forecasting

**REFERENCES / MANUALS/SOFTWARE**

JDK 1.4 and above

Blazix Web and Application server

Visi Broker

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Experiment the concepts of RMI-IIOP and implement them practically
- CO2: Explore the client and server side components of Java technology and manipulate them practically
- CO3: Develop web applications using MVC architecture and implement them practically
- CO4: Do experiments in CORBA and implement Banking or Library applications
- CO5: Gain knowledge in advanced concepts like DII and DSI

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1		3										2	
CO2		3										2	
CO3		3										2	
CO4		3										2	
CO5		3											

3 – Substantial, 2 – Moderate, 1 – Slight

**11CS705 CASE TOOLS LABORATORY**  
(Common to CSE and IT branches)

0 0 3 1

**LIST OF EXPERIMENTS /EXERCISES**

1. Student marks analyzing system  
To calculate CGPA, attendance percentage, no of failures in each subject, no of subjects failed by individual students, Comparison with previous exam.
2. Quiz system  
To create an online quiz in various categories like general knowledge, science and technology, sports, political events, entertainment.
3. Online ticket reservation system  
To create an online ticket reservation system which consists of starting point, destination and category of traveling details
4. Payroll system  
To create a payroll system which involves calculating DA, HRA, gross salary, TAX amount to be paid, EPF, VPF
5. Course registration system  
To create a new system which involves the course selection in different engineering colleges like counseling with their equivalent mark and its cut off mark to select a course.
6. Expert systems  
To create a system to verify the model
7. ATM system  
The systems involves a good user interface display with various options like withdrawal, account transfer, deposit, mini statement, current account, savings account, joint account, PIN number change etc
8. Stock maintenance  
To have an inventory system which involves the old stock, new purchase, currently sold, pending items etc
9. Real-Time scheduler  
Create a model for real time application
10. Remote procedure call  
Create a model to establish communication between various systems

**REFERENCES / MANUALS/SOFTWARE:**

IBM Rational Suite

**COURSE OUTCOMES**

**On completion of the course the students will be able to**

- CO1: Understand the usage of Rational Rose modeling tool
- CO2: Develop the models using Rational Rose
- CO3: Design various diagrams for an Object Oriented model
- CO4: Test the model with real time applications

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1		3											
CO2		3									3		
CO3				3								3	
CO4		3		3									

3 – Substantial, 2 – Moderate, 1 – Slight

**11GE701 TOTAL QUALITY MANAGEMENT**  
(Common to all Engineering and Technology branches)

**3 0 0 3**

**MODULE – I**

**15**

**Quality Systems:** Definition of Quality, Dimensions of Quality, Quality Planning, Quality costs, Basic concepts of Total Quality Management, Historical Review. Need for ISO 9000 and Other Quality Systems, ISO 9000:2008 Quality System – Elements, Implementation of Quality System, Documentation, Quality Auditing, Introduction to TS 16949, QS 9000, ISO 14000, ISO 18000, ISO 20000, ISO 22000.

**MODULE – II**

**15**

**TQM Principles:** Principles of TQM, Leadership – Concepts, Quality Council, Quality Statements, Strategic Planning, Deming Philosophy, Barriers to TQM Implementation. Customer satisfaction – Customer Perception of Quality, Customer Complaints, Customer Retention, Employee Involvement – Motivation, Empowerment, Teams, Recognition and Reward, Performance Appraisal, Benefits. Continuous Process Improvement – Juran Trilogy, PDSA Cycle, 5S, Kaizen, Supplier Partnership – Partnering, Sourcing, Supplier Selection, Supplier Rating, Relationship Development, Performance Measures – Basic Concepts.

**MODULE – III**

**15**

**TQM Tools:** The seven tools of quality, Statistical Fundamentals – Measures of central Tendency and Dispersion, Population and Sample, Normal Curve, Control Charts for variables and attributes, Process capability, Concept of six sigma, New seven Management tools, Poka Yoke. Benchmarking – Reasons to Benchmark, Benchmarking Process, Quality Function Deployment (QFD) – House of Quality, QFD Process, Benefits, Taguchi Quality Loss Function, Total Productive Maintenance (TPM) – Concept, Improvement Needs, FMEA – Stages of FMEA.

**TOTAL :45**

**TEXT BOOKS**

1. Besterfield, Dale H. et al., “Total Quality Management”, Third Edition, Pearson Education, 2008
2. Subburaj Ramasamy, “Total Quality Management”, Tata McGraw Hill, New Delhi, 2007.

**REFERENCE BOOKS**

1. Feigenbaum. A.V, “Total Quality Management”, Tata McGraw Hill, New Delhi, 1999.
2. Suganthi, L and Samuel A Anand., “Total Quality Management”, PHI Learning, New Delhi.
3. Evans James R. and Lindsay William M., “The Management and Control of Quality”, Seventh Edition, South-Western (Thomson Learning), 2007.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: analyse and certify quality standards for industries and organisations
- CO2: understand the principles and the various tools available to achieve Total quality management
- CO3: ethically responsible for attaining quality control

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1						3		3		3			3
CO2						3		3		3			3
CO3						3		3		3			3

3 – Substantial, 2 – Moderate, 1 – Slight



## 11IT701 NETWORK SECURITY

3 1 0 4

### MODULE – I

15

**Introduction:** OSI Security Architecture - Classical Encryption techniques – Cipher Principles – Data Encryption Standard – Block Cipher Design Principles and Modes of Operation - Evaluation criteria for AES – AES Cipher – Triple DES – Placement of Encryption Function – Traffic Confidentiality

**Public key cryptography:** Key Management - Diffie-Hellman Key Exchange – Elliptic Curve Architecture and Cryptography - Introduction to Number Theory – Confidentiality using Symmetric Encryption – Public Key Cryptography and RSA.

### MODULE - II

15

**Authentication and Network Security:** Authentication requirements – Authentication functions – Message Authentication Codes – Hash Functions – Security of Hash Functions and MACs – MD5 message Digest algorithm - Secure Hash Algorithm – RIPEMD – HMAC Digital Signatures – Authentication Protocols – Digital Signature Standard - Authentication Applications: Kerberos – X.511 Authentication Service.

### MODULE - III

15

**Web Security and System Level Security:** Electronic Mail Security – PGP – S/MIME - IP Security – Web Security - Intrusion detection – password management – Viruses and related Threats – Virus Counter measures – Firewall Design Principles – Trusted Systems.

**Lecture: 45, Tutorial:15, TOTAL : 60**

### TEXT BOOKS

1. Stallings, William, “Cryptography and Network Security: Principles and Practices”, Fourth Edition, Prentice Hall of India, New Delhi, 2007.
2. Forouzan, Behrouz A., “Cryptography and Network Security”, Tata McGraw-Hill, New Delhi, 2007.

### REFERENCE BOOKS

1. Kahate, Atul, “Cryptography and Network Security”, Tata McGraw-Hill, New Delhi, 2003.
2. Schneier, Bruce, “Applied Cryptography”, Second Edition, John Wiley & Sons Inc, New York, 2003.
3. Trappe, Wade and Washington, Lawrence C., “Introduction to Cryptography with Coding Theory”, Second Edition, Pearson education, 2009

### COURSE OUTCOMES

On completion of the course the students will be able to

- CO1: Know the methods in conventional encryption
- CO2: Know the basic concepts of public key encryption and number theory
- CO3: Understand authentication and hash function techniques
- CO4: Know the protocols used in network security and their functionalities
- CO5: Know the system level security by password management and firewalls

#### Mapping of Course Outcomes (COs) with Program Outcomes (POs)

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	3									3			3
CO2	3				3					3			3
CO3	3									3			3
CO4	3				2					3			3
CO5					2					3			

3 – Substantial, 2 – Moderate, 1 – Slight

**11IT702 WEB TECHNOLOGY**  
(Common to CSE and IT branches)

**3 0 0 3**

**MODULE – I**

**15**

**Introduction to XHTML:** Introduction to computers and the Internet – Web Browser basics – Dive into Web 2.0 – Introduction to XHTML – Cascading Style Sheet.

**MODULE - II**

**15**

**Client Side Scripting:** Introduction to scripting , Control statements I – Control statements II- Functions – Arrays – Objects – Document Object Model(DOM): Objects and collections – Events – Event Bubbling

**MODULE - III**

**15**

**Server Side Scripting:** Web Servers(IIS and Apache) – Database: SQL, MySQL, ADO.NET 2.0 – PHP – ASP.NET Ajax – Active Server Pages

**XML:** Introduction – XML basics –Structuring data – XML Namespaces –Document Type Definitions(DTD) – Schema documents

**TOTAL : 45**

**TEXT BOOKS**

1. Deitel. H M, Deitel. P J and Goldberg A B, “Internet and World Wide Web: How to Program”, Pearson/Prentice Hall of India, New Delhi, Fourth Edition, 2009.
2. Godbole. A.S., and Kahate. A., “Web Technologies”, Second Edition, Tata McGraw-Hill, New Delhi, 2008.

**REFERENCE BOOKS**

1. Deitel. H.M. and Deitel, P.J. and Nieto, T.R., “XML How to Program,” Pearson Education publishers, New Delhi, 2001.
2. Potts, Stephen and Kopack, Mike., “Teach yourself Web Services in 24 hrs”, Pearson Edition, 2004.
3. Ladd Eric, and O’ Donnel Jim, “Using HTML 4, XML and Java”, Prentice Hall of India / QUE, New Delhi, 1999.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Understand the basics of web designing tools
- CO2: Know the client side scripting languages and Document Object Model (DOM)
- CO3: Acquire knowledge in different server side scripting languages
- CO4: Appreciate the importance of XML basics and structure of XML Document Type Definitions(DTD)

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1		2	2									3	
CO2		2	2									3	
CO3		2	2									3	
CO4		2	2									3	

3 – Substantial, 2 – Moderate, 1 – Slight

**MODULE – I****15**

**Cellular Mobile Wireless Networks:** Description of cellular systems- Propagation models for wireless networks- Models for multi path reception- Mobile communication antennas- FDMA- TDMA- SDMA- CDMA

**2G and 2.5G Networks:** GSM- Network architecture- Air Interface- Multiple access scheme- Channel organization- Call setup procedure- Protocols and signaling- Authentications and security- Signaling system 7- Routing of a call to a mobile subscriber- GPRS- Network architecture- Signaling- States of mobility management- Location management procedures- Roaming- IP internetworking model- GPRS interfaces and related protocols- GPRS applications

**MODULE – II****15**

**3G Networks:** UMTS- Network architecture- Interface- FDD and TDD- Channels- Time slots- Network protocol architecture- Bearer model- UTRAN transport network- Security procedure and handover- LTE

**IP on Wireless Networks:** IP for GPRS and UMTS- Protocol reference model for UMTS-PS domain-Packet routing and transport of user data in UMTS networks- Mobility management in wireless networks and UMTS networks- Limitations of current TCP/IP networks for mobility support- Mobility solution -Accessing external PDN through GPRS/UMTS PS domain- Limitations for MIB based mobility management

**MODULE – III****15**

**Wireless Local area Networks:** WLAN-IEEE 802.11, Transmission technology- Spread spectrum technology, System architecture, Logical architecture- CSMA/CD, CSMA/CA- MAC frame format and fragmentation- IEEE 802.11 point coordination function- IEEE 802.11 PHY layer- Security issues- IEEE 802.11e QoS issues- IEEE 802.11 services- Handover- Mobility management and applications

**WiMAX Technologies:** Broadband wireless-Spectrum allocation- WiMAX- WiFi-Optical fiber and 3G- IEEE 802.16 architecture- WiMAX PHY- IEEE 802.16 MAC and scheduling services- Bandwidth allocation and request mechanisms- Network entities and initialization- Ranging and network architecture - IEEE 802.16e handover procedures

**Lecture: 45, Tutorial:15, TOTAL : 60****TEXT BOOKS**

1. ITI Saha Misra, “Wireless Communications and Networks”, Tata McGraw-Hill, 2009
2. Stallings, William., “Wireless Communications and Networks”, Second Edition, Pearson Education, New Delhi, 2005.

**REFERENCE BOOKS**

1. Schiller, Jochen, “Mobile Communications”, Second Edition, Pearson Education, 2003.
2. Pahlavan Kaveh, and Prasanth Krishnamoorthy, “Principles of Wireless Networks”, First Edition, Pearson Education, 2003.
3. Kamila Fahar, “Wireless Digital Communications: Modulation and Spread Spectrum Applications” , PHI Education, 2002.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Know the concepts of wireless networks and multiple access techniques
- CO2: Know the basic concepts of 2G and 2.5G networks and their applications
- CO3: Understand the concepts of 3G and IP on wireless networks
- CO4: Gain basic knowledge in Wi-Max technologies

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	2									3			
CO2										2			3
CO3	2									3			3
CO4	2									3			3

3 – Substantial, 2 – Moderate, 1 – Slight

**11EC607 EMBEDDED SYSTEMS**  
(Common to Mechatronics, EEE, EIE, CSE and IT branches)

**3 0 0 3**

**MODULE- I** **15**  
**89C51 Microcontroller:** Introduction to RISC and CISC Machines -89C51 Micro controller hardware- Memory Bank- Memory mapping-Register organization-I/O pins - Counters and Timers-modes of operation-Serial Data communication I/O- Interrupts-Interfacing to external ROM-RAM memory-Instruction sets-Addressing modes

**MODULE- II** **15**  
**89C51 Programming and Applications :**Assembly language programming and Programming with C – Simple programming -I/O port programming -Timer and counter programming – Serial data Communication using max232 converter – Interrupt programming –89C51 Interfacing with Peripherals : LED-Seven segment display – Switch interfacing- LCD, Parallel and Serial -Analog to Digital Converter- Sensors – Stepper Motors - Speed control of DC motors- Matrix Keyboard and Digital to Analog Converter

**MODULE-III** **15**  
**Real-Time Operating System Concepts and Case Studies:** Architecture of the Kernel - task and task scheduler - Interrupt Service Routines – Semaphores –Mutex – Mailboxes - Message Queues - Event Registers – Pipes – Signals – Timers - Memory Management – Priority Inversion Problem - Scheduling approaches - Optimality of the Earliest deadline first (EDF) algorithm - challenges in validating timing constraints in priority driven systems - Use of  $\mu$ C/OS-II - Case study of coding for an Automatic Chocolate Vending Machine using MUCOS RTOS

**TOTAL : 45**

**TEXT BOOKS**

1. Mazidi, Mohammed Ali; Mazidi, Janice Gillispie;McKinlay,Rolin.D “The 8051 Microcontroller and Embedded Systems”, Pearson Education Asia, second edition, New Delhi, 2007.
2. Labrosse, Jean J., “Micro C/OS-II: The Real-Time Kernel”, Second Edition, CMP Books Group west Publications,2002

**REFERENCE BOOKS**

1. Vahid, Frank and Tony Givargis., “Embedded Systems Design: A unified Hardware /Software Introduction”, John Wiley, New York, 2002.
2. Rajkamal, “Embedded Systems Architecture, Programming and Design”, Tata McGraw-Hill, New Delhi, 2003.
3. Wolf, Wayne., “Computers as Components: Principles of Embedded Computing System Design”, Harcourt India, Singapore, 2001.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Implement 8/16 bit Arithmetic and logical operations using 8051 simulator  
 CO2: Implement interfacing of 8051 microcontroller with LED, LCD, Relay and switch

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1													3
CO2													3

3 – Substantial, 2 – Moderate, 1 – Slight

## 11IT704 WEB TECHNOLOGY LABORATORY

(Common to CSE and IT branches)

0 0 3 1

### LIST OF EXPERIMENTS /EXERCISES

1. Create a XHTML document for
  - a) display your class timetable using HTML tables
  - b) display the hobbies using ordered list
  - c) display first five semester subjects using unordered list
2. Create a XHTML document to
  - a) Get a library book or return the library book(with fine amount if the book is delayed to return)
  - b) display the tourism spots of Tamil Nadu using frames.
3. Create a XHTML document to do three types of CSS .
4. Write a JavaScript program to
  - a) Manipulate string operation using function
  - b) Search an array
  - c) Throw a die and find its number of occurrences
5. Write a JavaScript program to use Objects and Collections.
6. Write a JavaScript program to work with Events and Event Bubbling
7. Write using PHP to do the following
  - a) Regular Expression
  - b) Database connectivity for Airline Reservation.
8. Write programs using ASP.NET 2.0 and ASP.NET AJAX to do
  - a) e-mail validation.
  - b) password verification
  - c) Query the databases
  - d) Build an Online Quiz
  - e) Web Controls
9. XML and Databases
  - a) Creation of DTD for Book store
  - b) Creation of Schema for Book store

### REFERENCES / MANUALS/SOFTWARE:

1. Windows Operating System
2. IIS
3. ASP.NET
4. XML parser

### COURSE OUTCOMES

On completion of the course the students will be able to

CO1: Develop web pages using HTML

CO2: Write programs using XHTML and XML

CO3: Implement web pages using Java Script, ASP.NET and parse the XML data

### Mapping of Course Outcomes (COs) with Program Outcomes (POs)

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1		2	3									3	
CO2		2	2									3	
CO3		3	3									3	

3 – Substantial, 2 – Moderate, 1 – Slight

**11IT705 NETWORK SECURITY LABORATORY**  
(Common to CSE and IT branches)

**0 0 3 1**

**LIST OF EXPERIMENTS /EXERCISES**

1. Implementation of Ceasar cipher with Brute force attack, one time pad, poly alphabetic cipher
2. Implémentation of Permutation and Transposition Techniques
3. Implémentation of Single round DES
4. Implémentation of RSA
5. Implementation of Diffie Hellman key exchange
6. Implementation of Random number generator
7. Implementation of Fermat’s theorem, Euler’s theorem and Euclidian algorithm
8. Implementation of Extended Euclidian algorithm and CRT
9. Implementation of Miller Rabin Primality test and identifying the weakness of the test
10. Implementation of Hashing technique and Birthday attack
11. Implementation of Elliptic curve cryptography
12. Implementation of signature using DSS and RSA approach
13. Implementation of a simple firewall
14. Study of Kerberos, SSL and PGP

**REFERENCES / MANUALS/SOFTWARE:**

Linux and C

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Implement network security services and techniques
- CO2: Analyze various types of attacks in Network and overcome those attacks
- CO3: Implement security algorithms using Sender and Receiver approach

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1		3											
CO2		3			3	3							
CO3		3				3							3

3 – Substantial, 2 – Moderate, 1 – Slight

**LIST OF EXPERIMENTS**

1. Programming for 8/16 bit Arithmetic and logical operations using 8051 simulator
2. Programming for interrupts of 8051 microcontroller
3. Programming for timer of 8051 microcontroller
4. Design of scrolling display
5. Programming for I/O ports of 8051 controller
6. ADC and DAC interface
7. Interfacing with LED AND LCD
8. Serial communication ( interface controller with PC)
9. Interfacing with Relay and Switch
10. Traffic light control using 8051 microcontroller

**REFERENCES / MANUALS/SOFTWARE:**

8051 simulator

**COURSE OUTCOMES**

On completion of the course the students will be able to

CO1: Implement 8/16 bit Arithmetic and logical operations using 8051 simulator

CO2: Implement interfacing of 8051 microcontroller with LED, LCD, Relay and switch

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1		3						3					
CO2		3						3					

3 – Substantial, 2 – Moderate, 1 – Slight

## 11GE801 PROFESSIONAL ETHICS AND HUMAN VALUES

(Common to all Engineering and Technology branches)

3 0 0 3

### MODULE – I

15

**Introduction to Human Values and Engineering Ethics:** Understanding: Morals- Values-Ethics– Honesty – Integrity – Work Ethic – Service Learning – Civic Virtue –caring – Sharing– Courage – Valuing Time – Co-operation – Commitment – Empathy –Self-Confidence – Character – Spirituality- Senses of 'Engineering Ethics' - variety of moral issues - types of inquiry - moral dilemmas - moral autonomy - Kohlberg's theory - Gilligan's theory - consensus and controversy – Models of Professional Roles - theories about right action - Self-interest –customs and religion- uses of ethical theories.

### MODULE - II

15

**Safety, Responsibilities and Rights:** Meaning of Engineering experimentation - engineers as responsible experimenters - codes of ethics for engineers - a balanced outlook on law - the challenger case study. Safety and risk - assessment of safety and risk - risk benefit analysis and reducing risk - the Three Mile Island and Chernobyl case studies. Collegiality and loyalty - respect for authority - collective bargaining - confidentiality - conflicts of interest - occupational crime - professional rights - employee rights – discrimination- Intellectual Property Rights (IPR)

### MODULE - III

15

**Global Ethical Issues and Codes :** Multinational corporations - Environmental ethics - computer ethics – weapons development-engineers as managers-consulting engineers-engineers as expert witnesses and advisors -moral leadership-sample code of Ethics like ASME, ASCE, IEEE, Institution of Engineers (India), Indian Institute of Materials Management, Institution of Electronics and Telecommunication Engineers(IETE),India. etc.

**TOTAL: 45**

### TEXT BOOKS

1. Martin Mike and Schinzinger Roland, “Ethics in Engineering”, Tata McGraw-Hill, New Delhi, 2003.
2. Govindarajan M, Natarajan S, and Senthil Kumar V. S, “Engineering Ethics”, Prentice Hall of India, New Delhi, 2004.

### REFERENCE BOOKS

1. Fleddermann, Charles D., “Engineering Ethics”, Pearson Education/Prentice Hall, New Jersey, 2004.
2. Harris, Charles E, Michael S. Protchard and Michael J Rabins, “Engineering Ethics –Concepts and Cases”, Wadsworth Thompson Learning, United States, 2000.
3. Seebauer, Edmund G and Barry, Robert L., “Fundamentals of Ethics for Scientists and Engineers”, Oxford University Press, Oxford, 2001.

### COURSE OUTCOMES

On completion of the course the students will be able to

- CO1: Appreciate the various human values needed to function as an ethical professional
- CO2: Acquire knowledge to function in multi-disciplinary teams by following engineering ethics
- CO3: Identify, formulate and solve engineering problems based on codes provided by the professional bodies and rights of the individual
- CO4: Understand the impact of engineering solutions in a global and environmental context.

#### Mapping of Course Outcomes (COs) with Program Outcomes (POs)

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1						3				3			2
CO2						3				3			2
CO3						3							2
CO4						3				3			

3 – Substantial, 2 – Moderate, 1 – Slight



## 11CS704 SERVICE ORIENTED ARCHITECTURE

(Common to CSE and IT branches)

3 0 0 3

### MODULE – I

15

**Fundamentals:** Software architecture – Types of IT architecture – SOA – Evolution – Key components – Perspective of SOA – Enterprise - Wide SOA – Architecture – Enterprise applications – Solution architecture for enterprise application – Software platforms for enterprise applications – Patterns for SOA – SOA programming models- Service-oriented analysis and design – Design of activity, data, client and business process services

### MODULE – II

15

**Technologies:** SOA – SOAP – WSDL – JAX – WS – XML WS for .NET – Service integration with ESB – Scenario – Business case for SOA – stakeholder objectives – benefits of SPA – Cost savings - SOA implementation and governance – Strategy – SOA development – SOA governance – Trends in SOA – Event- driven architecture – Software as a service – SOA technologies – Proof-of-concept – Process orchestration – SOA best practices

### MODULE – III

15

**XML and Security:** Meta data management – XML security – XML signature – XML encryption – SAML – XACML – XKMS – WS-Security – Security in web service framework - advanced messaging - Transaction Processing – Paradigm – Protocols and coordination – Transaction specifications – SOA in mobile – Research issues

**TOTAL : 45**

### TEXT BOOKS

1. Shankar Kambhampaly, “Service –Oriented Architecture for Enterprise Applications”, Wiley India Pvt Ltd, 2008.
2. Eric Newcomer, and Greg Lomow., “Understanding SOA with Web Services”, Pearson Education, 2005.

### REFERENCE BOOKS

1. Eric Pulier, and Hugh Taylor, “Understanding Enterprise SOA”, Wiley India Pvt., 2009.
2. Thomas Erl , “Service-Oriented Architecture: Concepts, Technology, and Design”, Prentice Hall India, 2005.
3. Mark O’ Neill, et al. , “Web Services Security”, Tata McGraw-Hill, New Delhi, 2003.

### COURSE OUTCOMES

On completion of the course the students will be able to

- CO1: Know various architectural concepts of software  
CO2: Know the methodology of implementation of web services  
CO3: Understand the concepts of XML and web services security

#### Mapping of Course Outcomes (COs) with Program Outcomes (POs)

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1								2	3				
CO2								3	3			2	2
CO3								2	3			2	

3 – Substantial, 2 – Moderate, 1 – Slight

## 11IT801 PROJECT WORK

### COURSE OUTCOMES

On completion of the course the students will be able to

CO1: Understand the contemporary issues related to IT

CO2: Know the real world entities

### Mapping of Course Outcomes (COs) with Program Outcomes (POs)

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	3	3	2	3	3	2	2	2	3	3	3	2	3
CO2	2	3	3	3	2	2	3	3	3	2	3	3	3

1 – Slight, 2 – Moderate, 3 – Substantial

**11CS011 SOFTWARE QUALITY ASSURANCE**  
(Common to CSE and IT branches)

**3 0 0 3**

**MODULE - I**

**15**

**Introduction to Software Quality Assurance:** Software quality – Software development process models - Clean room methodology - Defect prevention process - Process maturity framework and quality standards – SEI process capability maturity model - SPR assessment - Malcolm Baldrige assessment – ISO 9000 - Product quality metrics - Defect density metric - Customer problems metric - Customer satisfaction metrics - In process quality metrics

**MODULE - II**

**15**

**Quality Tools:** Ishikawa’s Tool – Check list - Pareto diagram – Histogram - Scatter diagram - Run chart- Control chart - Cause and effect diagram - Rayleigh model- Code integration pattern - PTR sub model - PTR arrival/Backlog projection model - Reliability growth models - Criteria for model evaluation - Complexity metrics and models - Lines of code - Halstad’s Software science - Cyclomatic complexity - Syntactic constructs - Structure metrics

**MODULE - III**

**15**

**Quality Assessment:** Measuring and analyzing customer satisfaction - Customer satisfaction surveys - Analyzing satisfaction data - Satisfaction with the company - Conducting in-process quality assessments - Preparation phase - Evaluation phase - Summarization phase - Conducting software project assessments- Audit assessment - Software process maturity assessment and software project assessment - Software project assessment cycle - Proposed software project assessment method

**TOTAL: 45**

**TEXT BOOKS**

1. Kan. Stephen H., “Metrics and Models in Software Quality Engineering”, Second Edition, Pearson Education, 2009.
2. Kamna Malik, and Praveen Choudhary., “Software Quality: A Practitioner’s Approach”, Tata McGraw Hill, 2008.

**REFERENCE BOOKS**

1. Jeff Tian., “Software Quality Engineering: Testing, Quality Assurance, and Quantifiable Improvement”, Wiley-IEEE Computer Society Press, 2005.
2. Godbole, Nina S., “Software Quality Assurance: Principles and Practice”, Narosa, 2007.
3. Raghav Nandyal., “Making sense of Software Quality Assurance”, Tata McGraw Hill, 2007.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Understand different metrics for assessment of software quality
- CO2: Use appropriate quality tools.
- CO3: Apply metrics and models in relevance to the needs
- CO4: Understand various processes for assessing software quality

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	3				3					3		3	
CO2										3	3		
CO3										3	3	3	
CO4	3				3								

3 – Substantial, 2 – Moderate, 1 – Slight

## 11CS013 ADHOC NETWORKS

(Common to CSE and IT branches)

3 0 0 3

### MODULE - I

15

**WLAN and MAC Protocol:** Characteristics of wireless channel - Fundamentals of WLANs - IEEE 802.11 standard - HIPERLAN standard - Generation of cellular systems – WLL - Wireless ATM - IEEE 802.16 standard - HIPERACCESS - Adhoc Wireless Internet. MAC Protocols design issues - Goals and classification - Contention based protocols with reservation and scheduling mechanisms.

### MODULE - II

15

**Routing Protocol:** Design issues and classification - Table-driven, on-demand - Hybrid routing protocols - Routing protocols with efficient flooding mechanisms - Hierarchical and power-aware routing protocols. Multicast routing protocols design issues and operation - Architecture reference model – Classification - Tree-based and mesh-based protocols - Energy-efficient multicasting.

### MODULE - III

15

**Transport layer Protocol and Quality of Service:** Design issues - Goals and classification - TCP over Ad hoc wireless networks security - Security Requirements: Issues and challenges in security provisioning - Network security attacks - Security routing. Issues and challenges in providing QoS - Classification of QoS solutions - MAC layer solutions - Network layer solutions – QoS frameworks.

**TOTAL: 45**

### TEXT BOOKS

1. Siva Ram Murthy, C. and Manoj, B.S., “AdHoc Wireless Networks: Architectures and Protocols”, Prentice Hall PTR, 2004.
2. Misra, Sudip and Woungang, Isaac, “Guide to Wireless AdHoc Networks”, Misra, Subhas Chandra (Eds.),2009.

### REFERENCE BOOKS

1. Toh C.-K., “AdHoc Mobile Wireless Networks: Protocols and Systems”, Prentice Hall PTR, 2001.
2. Mohammad Ilyas, “The Handbook of AdHoc Wireless Networks”, CRC press, 2002.
3. Perkins, Charles E., “AdHoc Networking”, Addison – Wesley, 2000.
4. Stefano Basagni, Marco Conti, Silvia Giordano and Ivan Stojmenovic, “Mobile AdHoc Networking”, Wiley – IEEE press, 2004.

### COURSE OUTCOMES

On completion of the course the students will be able to

- CO1: Acquire knowledge of wireless and Adhoc networks
- CO2: Know the basics of MAC, Routing, Multicast Routing and Transport layer service
- CO3: Analyze the security requirements and QoS

#### Mapping of Course Outcomes (COs) with Program Outcomes (POs)

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	2				2								
CO2				3	2						1		
CO3	2												

3 – Substantial, 2 – Moderate, 1 – Slight

**11CS014 SOFTWARE TESTING**  
(Common to CSE and IT branches)

3 0 0 3

**MODULE – I**

**15**

**Software Testing Basics and Assessment:** Introduction – Concepts of testing - Functional testing – Non-functional testing - Test Planning - Test Preparation – Test execution – Test reporting and metrics- The three-step process to becoming a world-class testing organization - Building a software testing environment: Creating an environment supportive of software testing -Building the software testing process: Software testing guidelines

**MODULE - II**

**15**

**Software Testing Process:** The seven-step testing process: Overview of the software Testing process - Organizing for testing - Developing the test plan - Verification testing-Validation testing-Analyzing and reporting test results

**MODULE - III**

**15**

**Testing Responsibilities and using Agile:** Software development methodologies - Testing client/server systems-Testing software system security - Testing web-based systems - Building agility into the testing process: Using agile methods to improve software testing.

**TOTAL : 45**

**TEXT BOOKS**

1. Perry William., “Effective Methods for Software Testing”, Third Edition, Wiley – India, Reprint 2009.
2. Jenkins, Nick., “A Software Testing Primer”, Online book. [www.nickjenkins.net/prose/testing](http://www.nickjenkins.net/prose/testing).

**REFERENCE BOOKS**

1. Rajani. Renu, and Oak. Pradeep, “Software Testing Effective Methods: Tools and Techniques”, Tata McGraw-Hill, New Delhi, 2006.
2. Kit Edward., “Software Testing in the Real World”, Improving the Process, Pearson Education, New Delhi, 2005.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Understand the various steps of software testing
- CO2: Acquire knowledge in various software testing methodologies
- CO3: Verify and validate a software
- CO4: Apply software testing for security and web based systems

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1											3	3	
CO2											3	3	
CO3											3	3	
CO4											3	3	

3 – Substantial, 2 – Moderate, 1 – Slight

**11CS016 GRID COMPUTING**  
(Common to CSE and IT branches)

3    0    0    3

**MODULE - I**

**15**

**Grid Computing, Initiatives and Applications:** Introduction – Early grid activities- Current grid activities – An overview of grid business areas– Grid applications - Grid infrastructure- Grid computing organizations and their roles – Grid computing anatomy - Grid computing road map - Merging the grid services architecture with the web Services architecture – Service oriented architecture – Web service architecture – XML, related technologies and their relevance to web services – XML messages and enveloping – Service message description mechanisms – Relationship between web service and grid service – Web service interoperability and the role of the WS-I organization

**MODULE - II**

**15**

**Grid Computing Technologies:** OGSA – Introduction – OGSA architecture and goal - Sample use cases – CDC – NFS – Online media and entertainment – OGSA platform components – OGSi – Introduction – Grid services – A high-level introduction to OGSi – Technical details of OGSi specification – Introduction to service data concepts – Grid service : Naming and change management recommendations – OGSA basic services – CMM – Service domains – Policy architecture – Security architecture – Metering and accounting – Common distributed logging – Distributed data access and replication

**MODULE - III**

**15**

**Grid Computing Tool kits:** Globus GT5 toolkit: Architecture – GT5 software architecture model – Security in GT5 – Data management components – Information services: Monitoring and discovery system– OGSi .Net middleware solutions

**TOTAL: 45**

**TEXT BOOKS**

1. Joseph, Joshy and Fellenstein, Craig, “Grid Computing”, Pearson/PHI PTR, New Delhi, 2003.
2. Foster, I and Kesselam, C., “The GRID: Blueprint for a New Computing Infrastructure”, Morgan Kaufmann Publisher, San Francisco, 2004.

**REFERENCE BOOKS**

1. Abbas Ahmar., “Grid Computing: A Practical Guide to Technology and Applications”, Laxmi Publications (Firewall Media), New Delhi, 2004.
2. Janakiram. D.,” Grid Computing: A Research Monograph”, Tata McGraw-Hill- New Delhi, 2005.
3. <http://www.globus.org/toolkit>

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Understand the geneses of grid computing
- CO2: Know the approach to grid computing
- CO3: Acquire knowledge to use tool kits for implementing projects

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	2										3		
CO2											3	2	1
CO3	2											2	

3 – Substantial, 2 – Moderate, 1 – Slight

**11CS801 SOFTWARE PROJECT MANAGEMENT**  
(Common to CSE and IT branches)

**3      0      0      3**

**MODULE - I** **15**

**Introduction and Software Management Process Frame Work:** Conventional software management – Evolution of software economics – Improving software economics – Conventional and modern software project management.- Lifecycle phases – Artifacts of the process – Model based software architectures – Workflows of the process – Checkpoints of the process.

**MODULE - II** **15**

**Software Management Disciplines, Managed and Optimised Processes:** Iterative process planning - Organization and responsibilities – Process automation – Process control and process Instrumentation – Tailoring the process. Data gathering and analysis: Principles of data gathering, data gathering process, software measures, data analysis - Managing software quality – Defect prevention.

**MODULE - III** **15**

**New Trends in Software Engineering and Case Studies:** Agile Vs waterfall-Agile benefits and market survey reports - Agile methods (Focus only SCRUM) - SCRUM methodology (Complete process flow with roles) - SCRUM role - SCRUM Real play) - Real time case study - Tools in SCRUM - COCOMO cost estimation model – Change metrics – CCPDS-R

**TOTAL : 45**

**TEXT BOOKS**

1. Kelkar. S.A., “Software Project Management: A Concise Study”, Second Edition, Prentice Hall of India, 2009.
2. Henry., “Software Project Management(S)”, Dorling Kindersley (India) Pvt Ltd, 2008.

**REFERENCE BOOKS**

1. Jalote, Pankaj., “Software Project Management in Practices”, Pearson Education (Singapore), 2008
2. Stellman, Andrew and Greene, Jennifer., “Applied Software Project Management”, Shroff / o’reilly. 2005
3. Hughes, Bob, and Cotterell, Mike., “Software Project Management”, Tata McGraw-Hill, 2006.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Explore software project management activities from product concept through development based on best practices
- CO2: Understand unique risks, issues, and critical success factors associated with technology projects
- CO3: Understand various techniques for planning and managing a technology project
- CO4: Apply the basic methodologies for software design, development, testing and implementation

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	3				3						3	3	3
CO2	3									3		3	2
CO3					3					3	3	3	3
CO4	3											3	3

3 – Substantial, 2 – Moderate, 1 – Slight

**11EC012 SOFT COMPUTING**  
(Common to Mechatronics, ECE, CSE and IT branches)

**3 0 0 3**

**MODULE – I**

**15**

**Artificial Neural Networks:** Basic concepts - Biological neuron, Artificial neuron ,single layer perceptron-Multi layer perceptron-Supervised Learning Neural Networks - Adaline - Backpropagation Mutilayer Perceptrons - Radial Basis Function Networks - Unsupervised Learning Neural Networks - Competitive Learning Networks - Kohonen Self-Organizing Networks - Learning Vector Quantization - Hebbian Learning.

**MODULE - II**

**15**

**Fuzzy Systems, Neuro-Fuzzy Modelling:** Fuzzy sets and Fuzzy reasoning-Fuzzy Matrices-Fuzzy functions-decomposition- Membership Function Formulation and Parameterization - Defuzzification methods Fuzzy Rules and Fuzzy Reasoning: Extension Principle and Fuzzy Relations - Fuzzy If-Then Rules - Fuzzy Reasoning - Fuzzy Inference Systems - Mamdani Fuzzy Models - Sugeno Fuzzy Models - Tsukamoto Fuzzy Models - Input Space Partitioning , Applications. Adaptive Neuro-Fuzzy Inference Systems - Architecture - Hybrid Learning Algorithm - Learning Methods that Cross-fertilize ANFIS and RBFN , Classification and Regression trees-Data clustering algorithm.

**MODULE - III**

**15**

**Genetic Algorithm and Neuro-Fuzzy Applications:** Survival of the fittest-schema theorem -cross over, mutation-, reproduction methods-Application. ANFIS Applications - Introduction- Printed Character Recognition- Nonlinear System Identification- Channel Equalization- Adaptive Noise Cancellation – Soft Computing for color receipt prediction.

**TOTAL : 45**

**TEXT BOOKS**

1. Jang J.S.R., Sun C.T and Mizutani E, “Neuro Fuzzy and Soft Computing”, Pearson/Prentice Hall India, New Delhi, 2006.
2. Goldberg David E., “The Design of Innovation; Genetic Algorithm and Evolutionary Computation”, Kluwer Academic publisher, Dordrecht, 2002.

**REFERENCE BOOKS**

1. Ross Timothy J., “Fuzzy Logic Engineering Applications”, Tata McGraw-Hill, New Delhi, 1997.
2. Rajasekaran S and Vijayalakshmi Pai G A, “Neural Networks: Fuzzy Logic and Genetic Algorithms Synthesis and Applications”, Prentice Hall India, New Delhi, 2007.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Apply optimization algorithms in various applications
- CO2: Improve performance of neural networks using hybrid systems
- CO3: Acquire knowledge of soft computing techniques for solving real world problems

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	2										3		1
CO2	2										3	3	1
CO3	2											3	

3 – Substantial, 2 – Moderate, 1 – Slight



**11EC017 DIGITAL IMAGE PROCESSING**

(Common to Mechatronics, ECE, EIE, and Information Technology branches)

**3 0 0 3**

**MODULE – I**

**15**

**Digital Image Fundamentals and Transforms:** Elements of digital image processing systems- Elements of visual perception- psycho visual model- brightness- contrast- hue- saturation- mach band effect -Image sampling- Quantization - Basic relationship between pixels - Color image fundamentals - RGB- HSI models. Image Trasforms: 1D DFT- 2D transforms – DFT- DCT- Discrete Sine, Walsh- Hadamard, Slant- Haar, Hough Transform, KL transforms - properties of all transforms.

**MODULE – II**

**15**

**Image Enhancement and Restoration:** Spatial domain enhancement: gray level transformations - histogram equalization - Image averaging- Spatial filtering: Smoothing, Sharpening filters– Frequency domain filters: Smoothing – Sharpening filters - Homomorphic filtering- Color image enhancement. Image Restoration: degradation model- Unconstrained and Constrained restoration- Inverse filtering - Wiener filtering.

**MODULE – II**

**15**

**Image Segmentation, Compression and Representation:** Point- line and edge detection- Thresholding - Region based segmentation: Region splitting and merging. Need for data compression-Lossless compression-Lossy compression-compression standards. Image representation: chain codes – polygonal approximations – signatures – boundary segments – skeletons - Regional descriptors –Simple descriptors- Texture.

**TOTAL: 45**

**TEXT BOOK**

- Gonzalez Rafael C and Woods Richard E, “Digital Image Processing”, Second Edition, Pearson Education, New Delhi, 2004.

**REFERENCE BOOKS**

- Jain Anil K., “Fundamentals of Digital Image Processing”, Prentice Hall of India, New Delhi, 2002.
- Salomon David., “Data Compression: The Complete Reference”, Second Edition, Springer, Verlag, New York, 2001.
- Pratt William K, “Digital Image Processing”, John Wiley, New York, 2002.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Analyze thereal time images using 2D transforms
- CO2: Improve the quality of images with various enhancement techniques
- CO3: Realize edge detection and segmentation algorithms for images

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	3											3	
CO2	3				3							3	
CO3	3				3							3	

3 – Substantial, 2 – Moderate, 1 – Slight

**11CS603 .NET TECHNOLOGIES**  
(Common to ECE,CSE and IT branches)

**3 0 0 3**

**MODULE – I**

**15**

**.NET overview:** .NET overview - The .NET Platform -.NET framework design goal- .NET framework- The common language runtime- CLR environment-CLR executables-Metadata-Assemblies and Manifests-Intermediate Language (IL)-The CTS and CLS-CLR execution. .NET programming -Common programming model -Core features and languages-Language integration,Working with .NET components- Deployment options-Distributed components-COM+ services in .NET-Message queuing.

**MODULE – II**

**15**

**Introduction to C#:** C# Language fundamentals - Classes and Objects - Inheritance and Polymorphism - Operator Overloading – Structs – Interfaces- Arrays, Indexers, and Collections- Strings and Regular Expressions - Handling Exceptions - Delegates and Events - Threads and Synchronization.

**MODULE – III**

**15**

Windows and Web Application: Windows Applications: Windows Forms – Namespace – Windows Forms Development. ADO.NET: Architecture – Benefits – Content Components. Web Applications: ASP – ASP.NET – Namespace – Web Form Syntax – Application Development – Data Binding and the Use of Templates – State Management and Scalability – Form Authentication. Case Study: Application Development for Conducting Online Examination.

**TOTAL : 45**

**TEXT BOOKS**

1. Thuan L. Thai, “.NET Framework Essentials”, Third Edition, Hoang Lam Publisher: O’Reilly Media, 2003.
2. J. Liberty, “Programming C#”, Second Edition, O’Reilly, 2002.

**REFERENCE BOOKS**

1. Schildt, Herbert, “The Complete Reference: C#”, Tata McGraw-Hill, 2004.
2. Robinson, et al, “Professional C#”, Second Edition, WroxPress, 2002.
3. Troelsen,Andrew., “C# and the .NET Platform”, A Press, 2003.
4. www.w3schools.com

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Understand the basic concepts of .NET framework
- CO2: Gain programming skills in C#
- CO3: Develop applications using .NET technologies

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1					2							3	
CO2					3				2			3	
CO3					3				2			3	

3 – Substantial, 2 – Moderate, 1 – Slight

**11IT011 HIGH PERFORMANCE NETWORKS**  
(Common to CSE and IT branches)

**3 0 0 3**

**MODULE - I**

**15**

**High Speed Networks and congestion control:** Frame Relay Networks – Asynchronous transfer mode – ATM Protocol Architecture, ATM Logical Connections, ATM Cells – ATM Service Categories – AAL – High Speed LAN’s: Fast Ethernet, Gigabit Ethernet, Fibre Channel – Wireless LANs – Queuing Analysis- Queuing Models – Single Server Queues– Effects of Congestion -Congestion Control – Traffic Management – Congestion Control in Packet Switching Networks – Frame Relay Congestion Control-SDH/SONET and WDM

**MODULE - II**

**15**

**TCP and ATM congestion control:** TCP Flow control – TCP Congestion Control – Retransmission Timer Management – Exponential RTO Backoff – Karn’s Algorithm – Window management – Performance of TCP over ATM. Traffic and Congestion control in ATM – Requirements – Attributes – Traffic Management Frame work – Traffic Control – ABR traffic Management – ABR Rate Control, RM Cell Formats, ABR Capacity Allocation – GFR Traffic Management.

**MODULE - III**

**15**

**Quality of Service in IP Networks:** Integrated Services Architecture – Approach, Components, Services-Queuing Discipline- FQ, PS, BRFQ, GPS, WFQ – Random Early Detection, Differentiated Services. Protocols for QoS Support: RSVP – Goals and Characteristics, Data Flows, RSVP Operation, Protocol Mechanisms – Multiprotocol Label Switching – Operation, Label Stacking, Protocol details – RTP – Protocol Architecture, Data Transfer Protocol, RTCP.

**TOTAL : 45**

**TEXT BOOKS**

1. Stallings William, “High Speed Networks and Internets: Performance and QoS”, Second Edition, Pearson Education, 2002.
2. Warland and Pravin Varaiya, “High Performance Communication Networks”, Second Edition, Jean Harcourt Asia Pvt. Ltd., 2000.

**REFERENCE BOOKS**

1. Irvan Pepelnjk, Jim Guichard and Jeff Apcar, “MPLS and VPN Architecture”, Volume 1 and 2, Cisco Press, 2003.
2. Kasera Sumit and Sethi Pankaj, “ATM Networks”, Tata McGraw Hill, New Delhi, 2000.
3. Forouzan, Behrouz.A. “Data Communications and Networking”, Fourth Edition, Tata McGraw-Hill, New Delhi, 2006.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Know the different technologies involved in High Speed Networking.
- CO2: Acquire knowledge in ATM , high speed LAN and Frame relay
- CO3: Know the techniques of real-time traffic and congestion control
- CO4: Understand different levels of Quality of Service of different applications

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1				3							1		
CO2	2			3	2						1		
CO3	2				2								
CO4	2				2								

3 – Substantial, 2 – Moderate, 1 – Slight

**MODULE - I****15**

**Information Theory:** Information – Entropy, Information rate, classification of codes, Kraft McMillan inequality, Source coding theorem, Shannon-Fano coding, Huffman coding, Extended Huffman coding - Joint and conditional entropies, Mutual information - Discrete memory less channels – BSC, BEC – Channel capacity, Shannon limit.

**Source Coding-Text, Audio and Speech:** Text: Adaptive Huffman Coding, Arithmetic Coding, LZW algorithm – Audio: Perceptual coding, Masking techniques, Psychoacoustic model, MEG Audio layers I,II,III, Dolby AC3 - Speech: Channel Vocoder, Linear Predictive Coding

**MODULE - II****15**

**Source Coding-Image and Video:** Image and Video Formats – GIF, TIFF, SIF, CIF, QCIF – Image compression: READ, JPEG – Video Compression: Principles-I,B,P frames, Motion estimation, Motion compensation, H.261, MPEG standard

**Error Control Coding- Block codes:** Definitions and Principles: Hamming weight, Hamming distance, Minimum distance decoding - Single parity codes, Hamming codes, Repetition codes – Linear block codes, Cyclic codes - Syndrome calculation, Encoder and decoder - CRC

**MODULE - III****15**

**Error Control Coding:** Convolutional codes – Code tree- Trellis, State diagram - Encoding – Decoding: Sequential search and Viterbi algorithm – Principle of Turbo coding

**TOTAL : 45****TEXT BOOKS**

1. Bose R, “Information Theory, Coding and Cryptography”, Tata McGraw Hill, 2007.
2. Halsall, Fred., “Multimedia Communications, Applications Networks Protocols and Standards”, Pearson Education Asia, 2002.

**REFERENCE BOOKS**

1. Sayood K, “Introduction to Data Compression”, Third Edition, Elsevier, 2006.
2. Gravano S, “Introduction to Error Control Codes”, Oxford University Press, 2007.
3. Amitabha Bhattacharya, “Digital Communication”, Tata McGraw-Hill, 2006.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Understand error control coding techniques
- CO2: Analyze various encoding and decoding techniques
- CO3: Know the concepts of compression and decompression techniques

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1				3	3							3	1
CO2	3			3									1
CO3	3				3							3	

3 – Substantial, 2 – Moderate, 1 – Slight

**11IT013 JAVA TECHNOLOGIES**  
(Common to ECE,CSE and IT branches)

**3 0 0 3**

**MODULE – I**

**15**

**Basics and Evolution:** Overview of Java – J2SE, J2EE and J2ME – type casting – overloading – overriding – abstract classes – interfaces – remote interfaces – interface and implementation – serialization – Remote Method Invocation (RMI) – Remote Object Activation (ROA)

**RMI and IIOP:** Middleware – Interface Definition Language (IDL) – Object Request Broker (ORB) - RMI-IIOP – reflection – Java Native Interface (JNI) – Java Data Base Connectivity (JDBC)

**MODULE – II**

**15**

**Streams and Sockets:** IO streams – sockets – TCP, UDP and multicast sockets – applets – servlets – cookies – session tracking - applet to applet communication – applet to servlet communication

**JSP and Multimedia:** Java Bean – Jar files - Java Server Pages (JSP) – JSP objects and directives – multimedia streaming – Java Media Framework (JMF), Java Server Faces(JSF), Google Web Tool kit(GWT)

**MODULE – III**

**15**

**J2EE:** J2EE architecture – EJB – Session, Entity and Message driven beans – Model View Control (MVC) architecture – Java Naming and Directory Interface (JNDI) – eXtensible Markup Language (XML)

**J2EE services and J2ME:** Java Messaging Service (JMS) - Transactions – Java Transaction Service (JTS) – Java Connector Architecture (JCA) – Java Authentication and Authorization Service (JAAS) - J2ME overview – CLDC and CDC - J2ME architecture and development environment

**TOTAL: 45**

**TEXT BOOKS**

1. Asbury, Stephen and Weiner, Scott R., “Developing Java Enterprise Applications”, Second Edition, Wiley Publications, 2001.
2. Schildt, Herbert, “Java 2: The Complete Reference”, Fifth Edition, Tata McGraw Hill, 2002.

**REFERENCE BOOKS**

1. Elliotte Rusty Harold, “Java Network Programming”, O’Reilly publishers, 2000.
2. Hortsman and Cornell, “Core Java 2 Advanced Features, Volume - II”, Pearson Education, 2002.
3. Keogh, James., “J2ME: The Complete Reference”, Tata McGraw Hill, 2003.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Know advanced Java concepts and technologies
- CO2: Understand the basic concepts for different kinds of communication patterns including applet, servlet communication
- CO3: Develop applications rapidly by using JDBC-ODBC connectivity
- CO4: Design applications for mobile phones, iPod and other hand held devices

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1					2							3	
CO2					2							3	
CO3					1							2	
CO4					2							3	3

3 – Substantial, 2 – Moderate, 1 – Slight

**11IT014 CLOUD COMPUTING**  
(Common to CSE and IT branches)

**3 0 0 3**

**MODULE – I**

**15**

**Cloud and Services:** Introduction – Evolution of cloud computing – Hardware evolution – Internet software evolution – Server virtualization – Web services overview - IaaS - PaaS – SaaS-XaaS  
**Cloud Networks:** Building cloud networks – Cloud data center – Service oriented architecture - Virtualization – Federation – Presence – Identity Privacy.

**MODULE – II**

**15**

**Access to Cloud:** Hardware and infrastructure – Clients – Security – Network – Services - Accessing the cloud – Platforms – Web applications – Web APIs- Web browsers  
**Standards and Infrastructure:** Cloud storage overview – Cloud service providers – Standards- application – Client – Infrastructure – Service – Software as a service overview –Driving forces – Software and services – Developing applications.

**MODULE – III**

**15**

**Security and Standards:** Security – Challenges – SaaS security – Common standards – Open cloud consortium – Standards for application developers, Messaging and security  
**Mobile Platform:** End user access – Mobile Internet devices – Smartphone – Mobile operating systems – Mobile platform virtualization – Collaboration applications

**TOTAL: 45**

**TEXT BOOKS**

1. Rittinghouse John, and Ransome James, “Cloud Computing: Implementation, Management, and Security”, CRC Press, 2010.
2. Toby Velte, Anthony Velte and Robert Elsenpeter, “Cloud Computing - A Practical Approach”, Tata McGraw Hill, 2010.

**REFERENCE BOOKS**

1. Michael Miller, “Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online”, QUE publishing, 2009.
2. George Reese, “Cloud Application Architectures: Building Applications and Infrastructure in the cloud”, O Rilly Publications, 2009.
3. Miller F.P., Vandome A.F and Mc Brewster John., “Cloud Computing”, Alphascript Publishing, 2009.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Understand the components and functions of cloud computing
- CO2: Gain knowledge in various infrastructure services
- CO3: Work in cloud environment
- CO4: Apply the cloud computing techniques to mobile devices and platforms

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1								2					
CO2								3					3
CO3								2					
CO4													2

3 – Substantial, 2 – Moderate, 1 – Slight

## 11IT015 VISUALISATION TECHNIQUES

3 0 0 3

### MODULE - I

15

**Data Visualisation:** Visualization stages – Experimental Semiotics based on Perception Gibson’s Affordance theory – A Model of Perceptual Processing – Types of Data.

**Computer Visualisation:** Non-Computer Visualization – Computer Visualization: Exploring Complex Information Spaces – Fisheye Views – Applications – Comprehensible Fisheye views – Fisheye views for 3D data – Non Linear Magnification – Comparing Visualization of Information Spaces – Abstraction in computer Graphics – Abstraction in user interfaces.

### MODULE - II

15

**Multidimensional Visualization:** 1D, 2D, 3D – Multiple Dimensions – Trees – Web Works – Data Mapping: Document Visualization – Workspaces.

**Textual Methods of Abstraction:** From Graphics to Pure Text – Figure Captions in Visual Interfaces – Interactive 3D illustrations with images and text – Related work – Consistency of rendered – images and their textual labels – Architecture – Zoom techniques for illustration purpose – Interactive handling of images and text.

### MODULE - III

15

**Abstraction in Time and Interactive Systems:** Animating non Photo realistic Computer Graphics – Interaction Facilities and High Level Support for Animation Design – Zoom Navigation in User Interfaces – Interactive Medical Illustrations – Rendering Gestural Expressions – Animating design for Simulation – Tactile Maps for Blind People – Synthetic holography – Abstraction Versus Realism– Integrating Spatial and Non Spatial Data.

**TOTAL : 45**

### TEXT BOOKS

1. Colin Ware “Information Visualization Perception for Design”, 2nd edition, Morgan Kaufman 2004.
2. Stuart.K.Card, Jock.D.Mackinlay and Ben Shneiderman, “Readings in Information Visualization Using Vision to think”, Morgan Kaufmann Publishers, 1999

### REFERENCE BOOKS

1. Thomas Strothotte, “ Computer Visualization–Graphics Abstraction and Interactivity”, Springer Verlag Berlin Heiderberg 1998.

### COURSE OUTCOMES

On completion of the course the students will be able to

- CO1: Understand the basic concepts of visualization
- CO2: Know the different types of visualization techniques
- CO3: Acquire knowledge of abstraction and its methods
- CO4: Analyse the effects of abstraction in various systems

#### Mapping of Course Outcomes (COs) with Program Outcomes (POs)

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	3											3	
CO2	3				3							3	
CO3	3				3							3	
CO4	3				3								

3 – Substantial, 2 – Moderate, 1 – Slight

**11IT016 SYSTEM SOFTWARE**  
(Common to ECE and IT branches)

**3 0 0 3**

**MODULE - I**

**15**

**Introduction:** System software and machine architecture – SIC – CISC – MISC machine architectures – Memory – Data/ Instruction formats – Addressing modes – Instruction sets – I/O

**Assemblers:** Elements of assembly language programming – Basic assembler functions – SIC assembler – Assembler algorithm and data structures – Machine dependent assembler features – Machine independent assembler features – One pass assemblers and multi pass assemblers – Implementation – Example- MASM assembler

**MODULE - II**

**15**

**Loaders and Linkers:** Basic loader functions – Design of an absolute loader – A simple bootstrap loader – Machine dependent loader features – Relocation – Program linking – Algorithm and data structures- Machine-independent loader features – Automatic library search – Loader options – Loader design options – Linkage editors – Dynamic linking – Bootstrap loaders – Implementation – Example – DOS linker

**MODULE - III**

**15**

**Macro Processors:** Basic macro processor functions – Macro definition and expansion – Macro processor algorithm and data structures – Machine-independent macro processor features –Macro processor design options –Implementation example – MASM macro processor – ANSI C macro language

**Compiler and System Software Tools:** Basic compiler functions – Grammars – Lexical analysis – Syntactic analysis – Code generation- Database management systems- Text editors – Interactive debugging systems

**TOTAL : 45**

**TEXT BOOK**

1. Beck, Leland L. “System Software: An Introduction to Systems Programming”, Third Edition, Pearson Education Asia, 2000.

**REFERENCE BOOKS**

1. Aho A.U., Sethi Ravi and Ullman J.D., “Compilers: Principles, Techniques and Tools, Addison Wesley, 1988.
2. Dhamdhere, “Systems Programming and Operating Systems”, McGraw-Hill Education, New Delhi, 2003.
3. Donovan, John J. “Systems Programming”, Tata McGraw-Hill, New Delhi, 1972.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Understand the need of system software
- CO2: Know the basics of machine architecture and its relation with system software
- CO3: Know the design and implementation of assemblers
- CO4: Know the design and implementation of linkers and loaders
- CO5: Understand macro processors and system software tools

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1	2		3					2					
CO2			3		2			2				3	
CO3	2				2							3	
CO4	2		3		2			2				3	
CO5	2							2					

3 – Substantial, 2 – Moderate, 1 – Slight



**11IT017 MULTI-CORE ARCHITECTURE AND PROGRAMMING**  
(Common to CSE and IT branches)

**3 0 0 3**

**MODULE - I**

**15**

**Introduction to Multiprocessors and Scalability issues:** Scalable design principles – Principles of processor design – Instruction Level Parallelism, Thread level parallelism. Parallel computer models – Symmetric and distributed shared memory architectures – Performance Issues – Multi-core Architectures - Software and hardware multithreading – SMT and CMP architectures – Design issues – Case studies – Intel Multi-core architecture – SUN CMP architecture.

**Parallel Programming:** Fundamental concepts – Designing for threads. Threading and parallel programming constructs – Synchronization – Critical sections – Deadlock. Threading APIs.

**MODULE - II**

**15**

**OpenMP Programming:** OpenMP – Threading a loop – Thread overheads – Performance issues – Library functions. Solutions to parallel programming problems – Data races, deadlocks and livelocks – Non-blocking algorithms – Memory and cache related issues

**MPI programming:** MPI Model – Collective communication – Data decomposition – Communicators and topologies – Point-to-point communication – MPI Library

**MODULE - III**

**15**

**Multithreaded Application Development:** Algorithms – loop parallelism – recursive range specifications – parallel algorithms for streams. Program development and performance tuning

**Case Studies:** Count strings – quick sort – better matrix multiplication (Strassen) – Advanced Task programming - Memory allocation

**TOTAL : 45**

**TEXT BOOKS**

1. Shameem Akhter and Jason Roberts, “Multi-core Programming”, Intel Press, 2006.
2. Quinn, Michael J, “Parallel programming in C with MPI and OpenMP”, Tata McGraw Hill, 2003.

**REFERENCE BOOKS**

1. Hennessey, John L. and Patterson, David A., “Computer Architecture: A Quantitative Approach”, Fourth. Edition, Morgan Kaufmann / Elsevier Publishers, Amsterdam, 2007.
2. Culler, David E and Singh Jaswinder Pal, “Parallel Computing Architecture: A Hardware / Software Approach”, Morgan Kaufmann / Elsevier Publishers, Amsterdam, 1999.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Realize the difference between programming for serial processors and parallel processors
- CO2: Understand the challenges in parallel and multi-threaded programming
- CO3: Acquire knowledge in various parallel programming paradigms, and solutions

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1					3							3	1
CO2	3				3						1	3	1
CO3	3										1	3	

3 – Substantial, 2 – Moderate, 1 – Slight

**MODULE - I****15**

**Introduction, Lexical Analysis and Parsing:** Compilers – Phases of a compiler – Analysis synthesis phase- Cousins of the compiler – Grouping of phases – Compiler construction tools – Lexical analysis – Role of lexical analyzer - Input buffering – Specification of tokens – Finite automata -Regular expression to NFA and DFA – NFA to DFA Conversion - Design of a lexical analyzer generator (Lex). Role of the parser –Writing grammars –Context-Free Grammars – Top Down parsing –Bottom-up parsing –Parser generators (YACC)

**MODULE - II****15**

**Run Time Environment and Intermediate Code Generation:** Source language issue- Storage organization- Storage allocation strategies- Accessing non-local names-Parameter passing- Runtime storage management -Symbol table-Dynamic storage allocation

**Intermediate Code Generation:** Intermediate representation – Declarations – Assignment statements – Boolean expressions – Case statements – Back patching – Procedure calls.

**MODULE - III****15**

**Code Generation and Code Optimization:** Issues in the design of code generator – The target machine - Basic blocks and flow graphs – Next-use information – A simple code generator – DAG representation of basic blocks – Loops in flow graphs-Peephole optimization- Runtime environments – Source language issues – Storage organization – Storage allocation strategies – Access to non-local names – Parameter passing-Principal sources of optimization – Optimization of basic blocks – Introduction to global data flow analysis.

**TOTAL : 45****TEXT BOOKS**

1. Aho. Alfred, Sethi. Ravi, and Ullman. Jeffrey D, “Compilers: Principles, Techniques and Tools with Gradience”, Second Edition, Pearson Education Asia, New Delhi, 2008.
2. Holub, Allen I., “Compiler Design in C”, Prentice Hall of India, New Delhi, 2003.

**REFERENCE BOOKS**

1. Srikant.Y.N, and Priti Shankar, "The Compiler Design Handbook: Optimizations and Machine Code Generation", Second Edition, CRC Press, London, 2007.
2. Cooper, Keith, and Torczon Linda, "Engineering a Compiler", Morgan Kauffman Publishers, 2004.
3. Alexander Meduna, "Elements of Compiler Design", Auerbach Publications, 2007.

**COURSE OUTCOMES**

On completion of the course the students will be able to

CO1: Work on a simple lexical analyzer (YACC)

CO2: Gain knowledge in different types of storage strategies

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1					3						1	3	1
CO2	3											3	1

3 – Substantial, 2 – Moderate, 1 – Slight

## 11IT019 DATA WAREHOUSING AND DATA MINING

(Common to CSE and IT branches)

3 0 0 3

### MODULE - I

15

**Introduction:** Introduction to Data Warehouse-Data Warehouse Modelling--Data Warehouse Architecture-Implementation- Data Generalization- Importance of data mining- Data mining functionalities- Data objects and attribute types- Statistical descriptions of data- Major issues in data mining.

**Data Preprocessing :** Data cleaning- Data integration - transformation- Data reduction- Data discretization and concept hierarchy generation.

### MODULE - II

15

**Mining Association Rules:** Association rule mining – Apriori algorithm – FP growth algorithm– Pattern Evaluation methods.

**Classification:** Classification by decision tree induction – Bayesian classification – Rule based classification. **Cluster**

**Analysis:** Types of data in cluster analysis –Clustering Methods – Partitioning methods – Hierarchical methods.

**Outlier analysis:** Outlier Analysis- Outlier detection methods, Statistical approaches.

### MODULE - III

15

**Recent Trends and Applications:** Mining Complex data types- Statistical data mining- Views on Data mining foundations- Visual and Audio data mining- Data Mining applications- Data Mining and Society.

**TOTAL : 45**

### TEXT BOOKS

1. Han Jiawei and Kamber Micheline, “Data Mining: Concepts and Techniques”, Harcourt India India / Morgan Kauffman Pvt Ltd., New Delhi, Third edition,2012.

### REFERENCE BOOKS

1. Dunham Margaret H., “Data Mining: Introductory and Advanced Topics”, Pearson Education 2006.
2. Berson Alex, and Smith Stephen J., “Data Warehousing, Data Mining & OLAP”, MaGraw-Hill publication, 2008.
3. David Hand, Heikki Manila, and Padhraic Symth, “Principles of Data Mining”, Prentice Hall of India, New Delhi, 2004.

### COURSE OUTCOMES

On completion of the course the students will be able to

- CO1: Design a data warehouse
- CO2: Acquire knowledge in basic concepts of data mining and analyze the quality of a mining system
- CO3: Select a suitable mining technique to implement an application
- CO4: Understand the role of data mining in various fields

### Mapping of Course Outcomes (COs) with Program Outcomes (POs)

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1										3			
CO2	2									2			
CO3	2									3			
CO4	3									3			

3 – Substantial, 2 – Moderate, 1 – Slight

**11GE011 ENTREPRENEURSHIP DEVELOPMENT**  
(Common to all Engineering and Technology branches except Civil Engg.)

**3 0 0 3**

**MODULE – I**

**15**

**Entrepreneurship Concepts:** Meaning and Concepts of Entrepreneurship – Definition and Characteristics of an Entrepreneur – Entrepreneurial Process – The scope of Entrepreneurship in India. Entrepreneurial Motivation – Factors creating Entrepreneurship – Classification of Entrepreneurs – Intrapreneurship - Barriers to Entrepreneurship – Creativity, Innovation & Entrepreneurship - Role of Entrepreneurship in Economic Development.

**MODULE – II**

**15**

**Business Plan:** Business Planning Process – Idea generation, Environmental Scanning, Feasibility Analysis, Drawing Functional Plan - Marketing Plan – Production/Operations Plan –Organizational Plan – Financial Plan – Human Resource Plan – Project Report Preparation , Evaluation, Control and Review.

**MODULE – III**

**15**

**Managing a Small Business:** Sources of Finance - Institutions Supporting Entrepreneurs - EDPs. Small Scale Industry – The Strengths and Weaknesses of Small Business - Growth strategies – Sickness - Evaluation, Symptoms, Causes and Assessment – Rehabilitation of Sick Industries.

**TOTAL :45**

**TEXT BOOKS**

1. Madhurima Lall and Shikha Sahai, “ Entrepreneurship”, Excel Books, New Delhi, 2006
2. S.S.Khanka, “ Entrepreneurial Development”, S.Chand & Company Ltd, 2005

**REFERENCE BOOKS**

1. Robert D Hisrich, Michael P Peters and Dean A Shepherd, “Entrepreneurship”, Sixth Edition, Tata McGraw Hill, New Delhi, 2009.
2. Mary Coulter, “Entrepreneurship in Action”, Second Edition, Prentice Hall of India, New Delhi, 2005.
3. Jain P.C., “Handbook for New Entrepreneurs”, Oxford University Press, Oxford, 2003.

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Understand the concepts of entrepreneurship and the competency required to take up entrepreneurship as a career
- CO2: Acquire knowledge to prepare business plan and execute various steps involved in entrepreneurship management

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1					3							3	3
CO2	3												3

3 – Substantial, 2 – Moderate, 1 – Slight

# 11IT020 BUILDING ENTERPRISE APPLICATIONS

(Common to CSE and IT branches)

3 0 0 3

## MODULE – I

15

**Analysis and Modeling:** Introduction to enterprise applications and their types, software engineering methodologies, life cycle of raising an enterprise application, introduction to skills required to build an enterprise application, key determinants of successful enterprise applications, and measuring the success of enterprise applications, inception of enterprise applications, enterprise analysis, business modeling, requirements elicitation, use case modeling, prototyping, Non functional requirements, requirements validation, planning and estimation, concept of architecture, views and viewpoints, enterprise architecture, logical architecture, technical architecture.

## MODULE - II

15

**Architectural Design:** Technical architecture - design, different technical layers, best practices, data architecture and design – relational, XML, and other structured data representations. Infrastructure architecture and design elements - Networking, Internetworking, and Communication Protocols, IT Hardware and Software, Middleware, Policies for Infrastructure Management, Deployment Strategy, Documentation of application architecture and design.

## MODULE - III

15

**Construction and Testing:** Construction readiness of enterprise applications - defining a construction plan, defining a package structure, setting up a configuration management plan, setting up a development environment, introduction to the concept of Software Construction Maps, construction of technical solutions layers, methodologies of code review, static code analysis, build and testing. Dynamic code analysis – code profiling and code coverage, types and methods of testing an enterprise application, testing levels and approaches, testing environments, integration testing, performance testing, penetration testing, usability testing, globalization testing and interface testing, user acceptance testing, rolling out an enterprise application.

**TOTAL : 45**

## TEXT BOOKS

1. Anubhav Pradhan, Satheesha B. Nanjappa, Senthil K. Nallasamy, Veerakumar Esakimuthu, “Raising Enterprise Applications”, First Edition, Wiley India Pvt. Ltd, 2010.
2. Brett McLaughlin, “Building Java Enterprise Applications”, First Edition, O’Reilly Media publications, 2002.

## REFERENCE BOOKS

1. Soren Lauesen , “Software Requirements: Styles & Techniques”, First edition, Addison-Wesley Professional publications, 2002.
2. Brian Berenbach, Daniel J. Paulish, Juergen Kazmeier, Arnold Rudorfer, “Software Systems Requirements Engineering: In Practice”, First Edition, McGraw-Hill/Osborne Media publications, 2009.
3. Dean Leffingwell, Don Widrig , “Managing Software Requirements: A Use Case Approach”, First Edition, Pearson publications, 2003.
4. Varma Vasudeva, “Software Architecture: A Case Based Approach”, First Edition, Pearson publications, 2009.
5. Designing Enterprise Applications with the J2EE Platform (PDF available at-[http://java.sun.com/blueprints/guidelines/designing\\_enterprise\\_applications\\_2e/](http://java.sun.com/blueprints/guidelines/designing_enterprise_applications_2e/))
6. Srinivasan Desikan, Gopalaswamy Ramesh, “Software Testing Principles and Practices “, First Edition, Pearson publications, 2006

## COURSE OUTCOMES

On completion of the course the students will be able to

- CO1: Apply the concepts of Enterprise Analysis and Business Modeling
- CO2: Design and document the application architecture
- CO3: Construct and develop different solution layers
- CO4: Perform Code review, Code analysis and Build process
- CO5: Know different testing involved in enterprise application

### Mapping of Course Outcomes (COs) with Program Outcomes (POs)

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1												3	3
CO2			3									2	
CO3			2									2	3
CO4			3										
CO5												2	

3 – Substantial, 2 – Moderate, 1 – Slight

**11CS020 BUSINESS INTELLIGENCE AND ITS APPLICATION**  
(Common to CSE and IT branches)

3    0    0    3

**MODULE - I** **15**

**Introduction to Data Warehousing and BI** : Introduction to Data Warehousing – Data Warehouse Framework – Developing Data Warehouse – Management Framework – Business driven approach – DWRM Technique– OLTP – OLAP – Introduction to BI – BI Framework – BI Process – Applications of BI

**Multi-Dimensional Data Modeling** : Data warehousing design consideration and Dimensional Modeling – Dimensions, facts cubes, attribute, hierarchies, star and snowflake schema

**MODULE - II** **15**

**Changing Dimension** : Implementing Changing Dimension – Types of Slowing Changing Dimension – Rapidly Changing Dimensions– Designing Data Warehouse – Common Steps

**Data Integration** : Extract, Transform and Load process – Interface processing – Post loading processing - Introduction to ETL using SSIS – Integration services – Package structure – Package Items – Control flow - Data flow components – Sources, Transformations and Destinations

**MODULE - III** **15**

**Dimensional Modeling and Cube** : Dimensional Modeling – Best Practices – Modeling time intervals – Text oriented fact tables – Designing Parent child Dimensions – Designing for null values – Introduction to Dimensional Modeling using SSAS - Creating Cube - Measures – Dimensions – Managing dimensions

**Enterprise Reporting** : Concepts of Dashboards, Balanced Scorecards – Introduction to Reporting Using SSRS – Reporting Service – Report Structure – Report Delivery – Report Serving Architecture – Report Server – Creating Report using Tablix Data Region with Table Template

**TOTAL: 45**

**TEXT BOOKS**

- Soumendra Mohanty, “Data Warehousing Design, Development and Best Practices”, Tata McGraw-Hill, New Delhi, 2007
- Brian Larson, “Delivering Business Intelligence with Microsoft SQL Server 2008”, McGraw-Hill, 2009

**REFERENCE BOOKS**

- David Loshin, “Business Intelligence”, Morgan Kaufmann Publishers, San Francisco, Fifth edition, 2007
- Mike Biere, “Business Intelligence for the Enterprise”, Pearson Education, Tenth edition, 2008
- Larissa Terpeluk Moss, Shaku Atre, “Business Intelligence Roadmap”, Pearson Education, 2007

**COURSE OUTCOMES**

On completion of the course the students will be able to

- CO1: Understand the basic concepts of business intelligence
- CO2: Build business intelligence application using SSIS, SSAS, SSRS
- CO3: Understand the relation between data warehousing, data mining and reporting

**Mapping of Course Outcomes (COs) with Program Outcomes (POs)**

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1											2	1	
CO2			3								3	3	
CO3			3								1		2

3 – Substantial, 2 – Moderate, 1 – Slight

# 11IT021 WIRELESS APPLICATION DEVELOPMENT

(Common to CSE and IT branches)

3 0 0 3

## MODULE - I

15

**Introduction to Mobile Communication and Computing Mobile Communication:** An Overview - Mobile Computing Architecture- Wireless Devices and Platform-Mobile Operating Systems- Application of Wireless network and Mobile Communication-A short history of wireless Communication- A Market for Mobile Communication- A Simplified Reference Model Introducing Android: History of Mobile Software Development- The Open Handset Alliance- Android Platform-android version- Android platform architecture- Developing Android Applications- Configuring Development Environment- Android SDK- Android SDK Documentation- Android Emulator, Dalvik Debug Monitor Server (DDMS).

## MODULE - II

15

**Android Tools:** Building a sample Android application- Debugging Application in the Emulator Files and Directories- Adding Logging Support to Application- Media Support to Application- Adding Location-Based Services to Application- Debugging Application on the Hardware Anatomy of an Android Application : Terminology- Activities- lifecycle of an Android Activity- Services- Intent- Manifest File- Application's Identity- Permissions- Resources: Understanding the Resource Directory Hierarchy- Value Types- Values Using Eclipse- String Resources- Boolean Resources- Working with Colors- Images- Animation- Menus- XML Files- Layouts.

## MODULE - III

15

**Android User Interface Design Essentials:** Views and Layouts- TextView- EditText Controls - Buttons, Check Boxes, and Radio Groups - Check Boxes and Toggle Buttons Progress with ProgressBar -Displaying the Time- Options and Context Menus - Events-User Interfaces in Android Using Android Data and Storage APIs: Managing data using SQLite- Creating, Updating, and Deleting Database Records- Binding Data to the Application User Interface-Android Networking APIs: Mobile Networking Fundamentals- Web APIs: WebView Control

**TOTAL: 45**

## TEXT BOOKS

1. Jochen Schiller, "Mobile Communications", Second Edition, Prentice Hall of India / Pearson Education, 2011.
2. Lauren Darcey and Shane Conder, "Android Wireless Application Development", Pearson Education, 2nd Edition, 2011.

## REFERENCE BOOKS

1. Reto Meier, "Professional Android 2 Application Development", Wiley India Pvt Ltd, 2011
2. Mark L Murphy, "Beginning Android", Wiley India Pvt Ltd, 2009
3. Sayed Y Hashimi and Satya Komatineni, "Pro Android", Wiley India Pvt Ltd, 2009
4. William Stallings, "Wireless Communications and Networks", Second Edition, Prentice Hall of India / Pearson Education, 2004.

## COURSE OUTCOMES

On completion of the course the students will be able to

- CO1: Understanding the mobile os, mobile communication and computing
- CO2: Set up environment and create application
- CO3: Acquire knowledge in resources and services
- CO4: Designing UI and access the database

### Mapping of Course Outcomes (COs) with Program Outcomes (POs)

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1											2		
CO2			3								2	3	2
CO3			3									3	2

3 – Substantial, 2 – Moderate, 1 – Slight

# 11IT022 INFORMATION STORAGE & MANAGEMENT

(Common to CSE and IT branches)

3 0 0 3

## MODULE - I

15

**Storage Systems:** Introduction to evolution of storage architecture, key data center elements, virtualization, and cloud computing. Key data center elements - Host (or computer), connectivity, storage, and application in both classic and virtual environments. RAID implementations, techniques and levels along with the impact of RAID on application performance. Components of intelligent storage provisioning and intelligent storage implementations.

**Storage Networking Technologies:** Fibre channel SAN components, connectivity options, and topologies including access protection mechanism “Zoning”, FC protocol stack, addressing operations, SAN-based virtualization and VSAN technology, iSCSI and FCIP protocols for storage access over IP network, Converged protocol FCoE and its components Network Attached Storage (NAS) - components, protocol and operations, File level storage virtualization. Object based storage and unified storage platform.

## MODULE - II

15

**Backup, Archive and Replication:** Business continuity terminologies, planning and solutions, clustering and multipathing architecture to avoid single points of failure, Backup and recovery - methods, targets and topologies, Data duplication and backup in virtualized environment, Fixed content and data archive, Local replication in classic virtual environments, Remote replication in classic and virtual environment services and deployment models, cloud infrastructure components, cloud migration considerations.

## MODULE - III

15

**Cloud Computing:** Business drivers for Cloud computing, Definition of Cloud computing, Characteristics of cloud computing, Steps involved in transitioning from Classic data center to Cloud computing environment services and deployment models, Cloud infrastructure components, Cloud migration considerations.

**Securing and Managing Storage Infrastructure:** Security threats, and countermeasures in various domains security solutions for FC-SAN, IP-SAN and NS environments, Security in virtualized and cloud environment, Monitoring and managing various information infrastructure components in classic and virtual environments, Information lifecycle management (ILM) and storage tiering, Cloud service management activities.

**TOTAL: 45**

## TEXT BOOKS

1. Information Storage and Management : Storing Managing, and Protecting Digital Information in Classic, Virtualized, and Cloud Environments, 2<sup>nd</sup> Edition, EMC Education Services, Wiley ISBN : 978 -1-1180-9483

## REFERENCE BOOKS

1. Networked Storage Concepts and Protocols Techbook (Online Version)
2. Learning Aids on <https://education.emc.com/ISMbookv2/default.aspx>

## COURSE OUTCOMES

On completion of the course the students will be able to

- CO1: evaluate storage architectures and key data center elements in classic, virtualized, and cloud environments
- CO2: explain physical and logical components of a storage infrastructure including storage subsystems, RAID, and intelligent storage systems
- CO3: describe storage networking technologies such as FC SAN, IP SAN, FCoE, NAS, and object – based and unified storage
- CO4: articulate business continuity solutions – backup and replication, and archive for managing fixed content

### Mapping of Course Outcomes (COs) with Program Outcomes (POs)

COs/POs	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1			3					2			2	3	
CO2			2					3			3	2	
CO3			3					3			3	2	
CO4			3					3			3	2	

3 – Substantial, 2 – Moderate, 1 – Slight