

NANDHA ENGINEERING COLLEGE

(An Autonomous Institution affiliated to Anna University Chennai and approved by AICTE, New Delhi)
Erode-638 052, Tamilnadu, India, Phone: 04294 – 225585



**Curriculum and Syllabi
for
B.E. – Computer Science and Engineering [R13]**

(This Curriculum and Syllabi are applicable to Students admitted from the academic year 2013-2014 onwards)

JUNE 2016

NANDHA ENGINEERING COLLEGE
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

VISION OF THE DEPARTMENT:

To achieve excellence in Computer Science and Engineering education to meet the ever growing needs of the society.

MISSION OF THE DEPARTMENT:

Computer Science & Engineering Department is committed

- To ensure quality in major areas of Computer Science and Engineering keeping pace with the latest developments.
- To create the ability in the students to design, develop and test world class software systems.
- To promote life-long learning in core and emerging areas.
- To inculcate strong ethical values and leadership abilities in the minds of students so as to work towards the advancement of the society.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

The following Programme Educational Objectives are designed for B.E. Computer Science and Engineering programme in Computer Science and Engineering based on the Department Vision & Mission to provide higher engineering education and motivate research in the field of Computer Engineering.

- PEO 1** To transform the graduates as experts in computing profession to satisfy the needs of the core computer technology industry.
- PEO 2** To enable them to pursue higher studies and explore new paths in teaching and research.
- PEO 3** To empower the graduates to be able to offer innovative solutions to real life problems.
- PEO 4** To help the graduates to keep abreast of the latest trends in computer technology and ready for life-long learning process.
- PEO 5** To ensure that the graduates practice professional ethics in the Software Industry and possess the necessary soft skills for working in diverse cultural and interdisciplinary teams.

PROGRAMME OUTCOMES OF COMPUTER SCIENCE AND ENGINEERING (PO's)

On graduation from the Computer Science and Engineering programme, our students will have the ability to

- PO1** Apply fundamental principles of mathematics, science, basic engineering and computer science to solve real world engineering problems.
- PO2** Develop abilities to identify and formulate solutions to complex engineering problems.

- PO3** Design a system, subsystem, hardware/ software component or process to meet desired needs within realistic constraints.
- PO4** Use research-based knowledge to design and conduct experiments.
- PO5** Create, use and modify modern techniques/ tools using current computer languages of industrial standard.
- PO6** Ability to analyse the local and global impact of computing on individuals, organizations and society.
- PO7** Respond towards societal issues and environmental sustainability.
- PO8** Understand professional, ethical, legal security, social issues and responsibilities.
- PO9** Function effectively as an individual member, team member or team leader in diverse teams and in heterogeneous environment.
- PO10** Communicate effectively in both verbal and written form.
- PO11** Understand the engineering and management principles required for project management.
- PO12** Recognize the needs for, and develop the abilities for self-learning and continuous learning



NANDHA ENGINEERING COLLEGE**REGULATIONS 2013****B.E. Computer Science and Engineering****CURRICULUM AND SYLLABUS****SEMESTER I**

THEORY					
Course Code	Course Title	L	T	P	C
13GE101	English for Engineers - I	3	1	0	4
13GE102	Engineering Mathematics – I	3	1	0	4
13GE103	Engineering Physics – I	3	0	0	3
13GE104	Engineering Chemistry	3	0	0	3
13GE105	Engineering Graphics	3	1	0	4
13CS101	Problem Solving and C Programming	3	0	0	3
PRACTICAL					
Course Code	Course Title	L	T	P	C
13GE111	Physics and Chemistry Laboratory - I	0	0	3	2
13GE112	Engineering Practices Laboratory	0	0	3	2
13CS111	Computer Programming Laboratory	0	0	3	2
TOTAL		18	3	9	27

SEMESTER II

THEORY					
Course Code	Course Title	L	T	P	C
13GE201	English for Engineers - II	3	1	0	4
13GE202	Engineering Mathematics - II	3	1	0	4
13GE203	Engineering Physics – II	3	0	0	3
13GE204	Environmental Science and Engineering	3	0	0	3
13CS201	Data Structures	3	0	0	3
13EC202	Digital Principles and System Design	3	0	0	3
PRACTICAL					
Course Code	Course Title	L	T	P	C
13GE211	Physics and Chemistry Laboratory - II	0	0	3	2
13CS212	Data Structures Laboratory	0	0	3	2
13EC212	Digital Laboratory	0	0	3	2
TOTAL		18	2	9	26

SEMESTER III

THEORY					
Course Code	Course Title	L	T	P	C
13GE301	Transforms And Partial Differential Equations	3	1	0	4
13CS301	Operating Systems	3	0	0	3
13CS302	Object Oriented Paradigm and Programming	3	0	0	3
13CS303	Design and Analysis of Algorithms	3	0	0	3
13ECC01	Microprocessor and Interfacing	3	0	0	3
13EC305	Analog and Digital Communication	3	0	0	3
PRACTICAL					
Course Code	Course Title	L	T	P	C
13CS311	Operating Systems Laboratory	0	0	2	1
13CS312	Object Oriented Programming Laboratory	0	0	2	1
13ECC11	Microprocessor and Interfacing Laboratory	0	0	3	2
13PT311	Language Competency Development- I	0	0	2	0
TOTAL		18	1	9	23

SEMESTER IV

THEORY					
Course Code	Course Title	L	T	P	C
13GE403	Probability And Queuing Theory	3	1	0	4
13CS401	Database Systems	3	0	0	3
13CS402	Java Programming	3	0	0	3
13ITC01	Computer Architecture and Organization	3	0	0	3
13CS403	Software Engineering	3	0	0	3
13CS404	Computer Networks	3	0	0	3
PRACTICAL					
Course Code	Course Title	L	T	P	C
13CS411	Database Systems Laboratory	0	0	2	1
13CS412	Java Programming Laboratory	0	0	2	1
13CS413	Computer Networks Laboratory	0	0	3	2
13PT411	Language Competency Development- II	0	0	2	0
TOTAL		18	1	9	23

SEMESTER V

THEORY						
Course Code	Course Title	L	T	P	C	
13GE501	Discrete Mathematics	3	1	0	4	
13CS501	Internet and Web Programming	3	0	0	3	
13CS502	Mobile Computing	3	0	0	3	
13CS503	Object Oriented Analysis and Design	3	0	0	3	
13IT404	Theory of Computing	3	0	0	3	
E1	Elective (PE)	3	0	0	3	
PRACTICAL						
Course Code	Course Title	L	T	P	C	
13CS511	Internet and Web Programming Laboratory	0	0	3	2	
13CS512	Software Engineering / Case Tools Laboratory	0	0	3	2	
13CS513	Mini Project	0	0	2	1	
13PT511	Verbal Aptitude and Reasoning - I	0	0	2	0	
TOTAL		18	1	10	24	

SEMESTER VI

THEORY						
Course Code	Course Title	L	T	P	C	
13GE404	Statistics and Numerical Methods	3	1	0	4	
13CS601	Graphics and Multimedia	3	0	0	3	
13CS602	Open Source Tools and Components	3	0	0	3	
13CS603	Principles of Compiler Design	3	0	0	3	
13CS604	Embedded Systems	3	0	0	3	
E2	Elective (PE)	3	0	0	3	
PRACTICAL						
Course Code	Course Title	L	T	P	C	
13CS611	Graphics and Multimedia Laboratory	0	0	3	2	
13CS612	Open Source Laboratory	0	0	3	2	
13GE611	Comprehension	0	0	2	1	
13PT611	Verbal Aptitude and Reasoning - II	0	0	2	0	
TOTAL		18	1	10	24	

SEMESTER VII

THEORY					
Course Code	Course Title	L	T	P	C
13GEC07	Engineering Economics and Financial Accounting	3	0	0	3
13CS701	Principles of Cloud Computing	3	0	0	3
13CS702	C# & .Net Framework	3	0	0	3
E3	Elective (PE)	3	0	0	3
E4	Elective (OE)	3	0	0	3
E5	Elective (OE)	2	0	0	2
PRACTICAL					
Course Code	Course Title	L	T	P	C
13CS711	Cloud Laboratory	0	0	3	2
13CS712	C# & .Net Framework Laboratory	0	0	3	2
13GE711	Personality and Character Development	0	0	2	0
TOTAL		17	0	8	21

SEMESTER VIII

THEORY					
Course Code	Course Title	L	T	P	C
E6	Elective (PE)	3	0	0	3
E7	Elective (OE)	2	0	0	2
PRACTICAL					
Course Code	Course Title	L	T	P	C
13CS831	Project Work	0	0	20	10
TOTAL		5	0	20	15

LIST OF PROFESSIONAL ELECTIVES

B.E. Computer Science and Engineering

LIST OF ELECTIVES FOR E1					
Course Code	Course Title	L	T	P	C
13CSX01	Data Science	3	0	0	3
13CSX02	Data Warehousing and Data Mining	3	0	0	3
13CSX03	Advanced Database Technologies	3	0	0	3
13CSX04	Total Quality Management	3	0	0	3
LIST OF ELECTIVES FOR E2					
Course Code	Course Title	L	T	P	C
13CSX05	High Performance Networks	3	0	0	3
13CSX06	TCP/IP Design and Implementation	3	0	0	3
13CSX07	Distributed Computing	3	0	0	3
13CSX08	Network Analysis and Management	3	0	0	3
13CSX09	Wireless Communication And Networks	3	0	0	3
LIST OF ELECTIVES FOR E3					
Course Code	Course Title	L	T	P	C
13CSX10	Mobile Application Development	3	0	0	3
13CSX11	Human Computer Interaction	3	0	0	3
13CSX12	Green Computing	3	0	0	3
13ITX12	Information Storage Management	3	0	0	3
13CSX13	Knowledge Management	3	0	0	3
LIST OF ELECTIVES FOR E6					
Course Code	Course Title	L	T	P	C
13CSX14	Software Design And Architecture	3	0	0	3
13CSX15	Software Testing Methodologies	3	0	0	3
13CSX16	Software Agents	3	0	0	3
13CSX17	Software Quality Assurance	3	0	0	3
13CSX18	Software Project Management	3	0	0	3

LIST OF OPEN ELECTIVES (OE)**GROUP – I**

LIST OF THREE CREDIT OPEN ELECTIVES					
Course Code	Course Title	L	T	P	C
13CEZ01	Industrial Safety Engineering	3	0	0	3
13CEZ02	Human Behaviors at Work	3	0	0	3
13CEZ03	Air Pollution Management	3	0	0	3
13CEZ04	Building Services	3	0	0	3
13CSZ01	Computer Networks	3	0	0	3
13CSZ02	Software Engineering	3	0	0	3
13CSZ03	Data Structures	3	0	0	3
13CSZ04	Open Source Software	3	0	0	3
13CSZ05	Information Security	3	0	0	3
13ECZ01	Avionics	3	0	0	3
13ECZ02	Sensors and Transducers	3	0	0	3
13ECZ03	Modern Wireless Communication System	3	0	0	3
13ECZ04	Radar and Navigational Aids	3	0	0	3
13EEZ01	Renewable Energy Technology	3	0	0	3
13EEZ02	PLC and Automation	3	0	0	3
13EEZ03	Automotive Electronics	3	0	0	3
13EEZ04	Utilization and Conservation of Electrical Energy	3	0	0	3
13EIZ01	Autotronix	3	0	0	3
13EIZ02	Fiber Optic Sensors	3	0	0	3
13EIZ03	Industrial Automation	3	0	0	3
13EIZ04	Ultrasonic Instrumentation	3	0	0	3
13ITZ01	PC Hardware & Trouble Shooting	3	0	0	3
13ITZ02	Essentials of Information Technology	3	0	0	3
13ITZ03	Developing Mobile Apps	3	0	0	3
13ITZ04	Software Project Management	3	0	0	3
13MEZ01	Six Sigma	3	0	0	3
13MEZ02	Essentials of Radio Frequency Identification	3	0	0	3
13MEZ03	Electric Vehicle Technology	3	0	0	3
13MEZ04	Value Engineering	3	0	0	3

LIST OF OPEN ELECTIVES (OE)**GROUP - II**

LIST OF TWO CREDIT OPEN ELECTIVES					
Course Code	Course Title	L	T	P	C
13GEZ01	Sustainable Development	2	0	0	2
13GEZ02	Waste Management	2	0	0	2
13GEZ03	Design Thinking	2	0	0	2
13GEZ04	Big Data Analytics	2	0	0	2
13GEZ05	Robo Design	2	0	0	2
13GEZ06	Creativity Innovation And New Product Development	2	0	0	2
13GEZ07	Energy Auditing	2	0	0	2
13GEZ08	Energy Conservation	2	0	0	2
13GEZ09	Law for Engineers	2	0	0	2
13GEZ10	Advanced Mathematics for Engineers	2	0	0	2
13GEZ11	Disaster Management	2	0	0	2
13GEZ12	Industrial Psychology	2	0	0	2
13GEZ13	Project Management	2	0	0	2
13GEZ14	Quality Management and Economics	2	0	0	2

LANGUAGE ELECTIVES**LIST OF TWO CREDIT LANGUAGE ELECTIVES ***

Course code	Course Title	L	T	P	C
13GEY01	Hindi Language	2	0	0	2
13GEY02	German Language	2	0	0	2
13GEY03	Japanese Language	2	0	0	2

TOTAL CREDITS (27+26+23+23+24+24+21+15) = 183 CREDITS***PE – Professional Elective *OE – Open Elective**


Approved by Fourth Academic council

13GE101 - ENGLISH FOR ENGINEERS – I
(Common to All B.E/B.Tech Programmes)

L	T	P	C
3	1	0	4

OBJECTIVES:

- To enable students to build a repertoire of functional vocabulary and to move from the lexical level to the syntactic level
- To train students to summon words, phrases relevant to the immediate communication tasks
- To sensitize students to the nuances of the four basic communication skills – Listening, Speaking, Reading and Writing
- To prepare students acquire the ability to speak effectively in English in real life situations and work-related situations
- To develop persuasion and negotiation skills.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Develop communicative competence by enunciating words and sentences clearly and effectively.

CO2 : Interpret different accents and modulations through active listening.

CO3 : Build the habit of reading thereby acquiring knowledge on wide range of vocabulary.

CO4 : Improve the ability to speak effectively in English in real life situations and work related situations

CO5 : Compose cohesively and coherently avoiding grammatical errors

UNIT I: RECAP OF LANGUAGE SKILLS

(9+3)

Prefixes and Suffixes- General Vocabulary – antonym, synonyms, Analogy – Different Grammatical Forms of the Same Word- Tenses- Active and Passive Voices- Troublesome Articles and Prepositions – Adverbs and Phrasal Verbs – Modal Verbs, Compound Nouns and Expanding Nominal Compounds, Framing Wh Questions, Discourse markers

UNIT II: LISTENING FOR EFFECTIVENESS

(9+3)

Barriers to Listening -Listening to audio/video lectures- Listening to short conversations or monologues- Taking down phone messages- Listening and note- taking – Listening to role –plays – Listening for verbal and non-verbal communication- Listening to collect Data- Listening to Announcements- Listening to News on the Radio & Television

UNIT III: READING AND LANGUAGE COMPREHENSION

(9+3)

Active and Passive Reading- Intensive and Extensive Reading- Reading to understand the usage of Grammar- Skimming and Scanning the text- Interpreting Graphical representations- Reading scientific and Technical text- Reading with a purpose – Reading and note taking.

UNIT IV: ACQUISITION OF ORAL AND AURAL SKILLS

(9+3)

Basic in Phonetics- Phonetic Transcription- Consonant, Vowel sound- Pronunciation Guidelines related to Consonants and vowels- Stress and Intonation- Developing voice quality- Self Introduction- Welcome address, Vote of Thanks, Master of Ceremony, Short conversations, Dialogue and Debate.

UNIT V: PROFESSIONAL WRITING

(9+3)

Business Letters- letter writing skills, Parts of a letter- (Calling for Quotation, Placing Orders, Seeking Permission for Industrial Visit, Complaint Letters, Adjustment letters) - Email Writing- Free Writing on any given topic- Instructions and Recommendations.

TOTAL: 60 PERIODS

Note :

Listening and speaking activities will be done using Communication Lab and teaching materials will be elicited from various resources with required worksheets to be used in the class.

Exercises to be completed in communication lab

1. Listening to role-plays and rewriting the script in reported speech.
2. Extensive listening to a passage to attend multiple choice questions.
3. Listening to the pre-recorded voice, the student can record his/her own voice and compare correctness of his/her pronunciation.
4. Listening to the list of words and marking Stress, Intonation and Phonetic transcription.
5. Listening to audio/video lectures and reproducing in own words.
6. Listening to a text and attending True or False questions
7. Vocabulary Puzzles

TEXT BOOKS:

1. Rizvi and M Ashraf, "Effective Technical Communication", Tata McGraw Hill Publishing Company Limited, New Delhi, 2006.
2. Department of English, Anna University, "Mindscapes: English for Technologists and Engineers", Orient Blackswan, Chennai. 2012

REFERENCE BOOKS:

1. Norman Whitby, "Business Benchmark – Pre-Intermediate to Intermediate", Students Book, Cambridge University Press, 2006
2. S P Dhanavel, "English and Communication Skills for Students of Science and Engineering", Orient Blackswan, Chennai. 2011
3. Viswamohan and Aysha, "English for Technical Communication", Tata McGraw-Hill, New Delhi. 2008.
4. M Hewings, "Advanced English Grammar", Cambridge University Press, Chennai, 2000.
5. M Raman and Sangeetha Sharma, "Technical Communication", Oxford University Press, USA, 2005.

Extensive reading for internal evaluation

Students have to read the text "Selected Short Stories of the World", Maple Press, Noida and do a review presentation for Internal Assessment.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1									x	x		x
2									x	x	x	x
3									x	x		x
4									x	x		x
5									x	x		x



Approved by Fourth Academic council

13GE102 - ENGINEERING MATHEMATICS - I
(Common to All B.E/ B.Tech. Programmes)

L	T	P	C
3	1	0	4

OBJECTIVES:

To enable students to

- Identify, formulate and solve Engineering problems.
- Use the techniques, Skills and Engineering tools necessary for Engineering practice.
- Learn further topics of Mathematics in higher semesters in a graded manner.
- Appreciate the important role of Mathematical concepts in Engineering applications.

COURSE OUTCOMES:

At the end of the course, the students will be able to

- CO1 : Be capable of identifying algebraic Eigen value problems from practical areas and obtain the Eigen solutions in certain cases and to have acquired the technique of diagonalizing a matrix which would render the Eigen solution procedure very simple.
- CO2 : Have knowledge about the geometrical aspects of line, plane and sphere.
- CO3 : Understand effectively the geometrical aspects of curvature, involutes and evolutes of plane curves, essential concepts for an engineer, as elegant applications of differential calculus.
- CO4 : Understand and handle functions of more than one variable, from the points of view of their differentiation, expansions and extreme values, along with differentiation under integral sign which are encountered in engineering studies.
- CO5 : Have learnt the method of solving differential equations of certain types, including systems of differential equations that they might encounter in their studies of other subjects in the same or higher semesters.

UNIT I: MATRICES

(9+3)

Characteristic equation-Eigen values and Eigen vectors of a real matrix-Properties of Eigen values and Eigen vectors (without proof)-Cayley Hamilton Theorem(statement only) and its applications-Orthogonal transformation of a symmetric matrix to diagonal form- Nature of Quadratic form-Reduction of quadratic form to canonical form by Orthogonal transformation.

UNIT II: SOLID GEOMETRY

(9+3)

Equation of a Sphere-Tangent plane-Plane section of a sphere-Orthogonal sphere –Equation of a Cone – Right circular cone –Equation of a Cylinder – Right circular cylinder

UNIT III: GEOMETRICAL APPLICATIONS OF DIFFERENTIAL CALCULUS

(9+3)

Curvature – Curvature in Cartesian and polar co-ordinates-Centre and Radius of curvature-Circle of curvature-Evolutes and Involutives-Envelopes-Properties of envelopes and evolutes- Evolute as envelope of normals.

UNIT IV: FUNCTIONS OF SEVERAL VARIABLES

(9+3)

Partial derivatives- Euler's theorem on homogeneous function- Total differential-Differentiation of implicit functions-Taylor's expansion-Maxima and Minima-Constrained Maxima and Minima by Lagrange's multiplier method-Jacobians.

UNIT V: MULTIPLE INTEGRALS

(9+3)

Double integration in Cartesian and polar co-ordinates-Change of order of integration-Area as double integral-Change of variables between Cartesian & Polar Co-ordinates- Triple integration in Cartesian co-ordinates-Volume as triple integrals- Beta and gamma function.

TOTAL: 60 PERIODS

TEXT BOOKS:

1. N.P. Bali and Manish Goyal, "A text book of, Engineering Mathematics: SEM-I", 3rd ed., Laxmi Publications, 2011.
2. T. Veerarajan, "Engineering Mathematics for first year", 3rd ed., Tata McGraw Hill, 2011.
3. P. Kandasamy, K. Thilagavathy and K. Gunavathy, "Engineering Mathematics for first year", 7th Rev.ed., S.Chand & Co Ltd , 2010.

REFERENCES:

1. B.S.Grewal, "Higher Engineering Mathematics", 40th ed., Khanna publications, 2007.
2. Erwin Kreyszig, "Advanced Engineering Mathematics", 8th ed., John Wiley & Sons, 2001.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x		x					x	x	x
2	x	x	x		x					x	x	
3	x	x	x	x	x			x		x	x	x
4	x	x	x							x	x	
5	x	x	x	x				x			x	x



13GE103 - ENGINEERING PHYSICS - I
(Common to All B.E/ B. Tech. Programmes)

L	T	P	C
3	0	0	3

OBJECTIVES:

The aim of this course is to develop the skills of the students in physics under various topics. This will provide the basic ideas in large number of engineering subjects like civil construction with acoustical aids, ultrasonic techniques, laser technology, communication systems, and digital signal processing.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Acquire knowledge on acoustics, production and the applications of ultrasonic in engineering and medical Fields.

CO2 : Apply the knowledge in the field of interference and lasers techniques.

CO3 : Apply the knowledge in the field of Fiber optics and sensors.

CO4 : Understand the development of quantum mechanics and its necessary, wave equations and its applications, X - Ray.

CO5 : Analyze the crystallography and can able to calculate the crystal parameters.

UNIT I: ACOUSTICS & ULTRASONICS

(9)

Introduction - Classification of sound – characteristics of musical sound – loudness – Weber – Fechner law – decibel – absorption coefficient – reverberation – reverberation time – Sabine's formula (growth & decay). Factors affecting acoustics of buildings and their remedies. Ultrasonic: Introduction - Properties of ultrasonics – Production of ultrasonics – magnetostriction - piezo electric methods. Medical application: Sonogram - Engineering Application: Ultrasonic A B C scanning methods

UNIT II: OPTICS & LASER TECHNOLOGY

(9)

Interference: Air wedge – theory – uses – testing of flat surfaces – thickness of a thin wire. Types of lasers – Nd – YAG laser – CO₂ laser – semiconductor laser (homojunction & heterojunction). Applications: Determination of particle size using laser - Holography – construction – reconstruction – Medical and engineering Applications

UNIT III: FIBER OPTICS AND SENSORS

(9)

Fiber Optics: Principle of light transmission through fiber - expression for acceptance angle and numerical aperture – Fabrication of optical fibers- Double crucible method- types of optical fibers (refractive Index profile, mode) fiber optic communication system (block diagram only). Splicing – Medical Endoscope – Applications of optical fiber - Sensors- Temperature - Pressure sensor and displacement sensor.

UNIT IV: WAVE AND PARTICLE PHYSICS

(9)

Quantum Physics: Development of quantum theory – de Broglie wavelength – Properties of matter waves- G.P Thomson experiment – Schrödinger's wave equation – time dependent – time independent wave equations – physical significance – applications – particle in a one dimensional potential box - X-rays: Scattering of X-rays – Compton Effect – theory and experimental verification.

UNIT V: CRYSTALLOGRAPHY

(9)

Crystal Physics: Lattice – unit cell – Bravais lattices – lattice planes – Miller indices – 'd' spacing in cubic lattice – calculation of number of atoms per unit cell – atomic radius – coordination number – packing factor for SC, BCC, FCC and HCP structures – Crystal Growth Techniques- Solution, Melt (Bridgman and Czochralski) and vapour growth techniques(qualitative).

TOTAL: 45 PERIODS

TEXT BOOKS:

1. V. Rajendran, "Engineering Physics", Tata McGraw-Hill, New Delhi, 2011.
2. K. Tamilarasan and K. Prabu, "Engineering Physics I", 2nd ed., Tata McGraw-Hill. New Delhi, 2011.
3. G.Senthilkumar, "Engineering Physics I", VRB Publishers, 2011.

REFERENCES:

1. P. K. Palanisami, "Physics for Engineers", Vol. 1, Scitech Publishers. (India) Pvt. Ltd., Chennai, 2002.
2. M. N. Avadhanulu and P. G. Kshirsagar, "A Textbook of Engineering Physics", S. Chand & Company Ltd., New Delhi, 2005.
3. V. Rajendran and A. Marikani, "Physics I", TMH, New Delhi, 2004.
4. R. K. Gaur and S. L. Gupta, "Engineering Physics", Dhanpat Rai Publishers, New Delhi, 2006.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x		x			x			x	x	x
2	x	x	x	x		x	x			x	x	x
3	x			x	x		x	x		x	x	x
4	x	x										
5	x	x								x		



13GE104 - ENGINEERING CHEMISTRY
(Common to All B.E/ B. Tech. Programmes)

L	T	P	C
3	0	0	3

OBJECTIVE :

- The students should be conversant with the principles water characterization and treatment of potable and industrial purposes.
- The students are able to study about the principles of electrochemistry and energy storage devices and principles of corrosion control.
- Principles of polymer chemistry and engineering applications of polymers
- Have gained a well founded knowledge of chemistry of fuels

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Apply knowledge of fundamental principles of chemistry.

CO2 : Define and solve engineering problems, including the utilization of creative and innovative skills.

CO3 : Gain practical experience with chemical process equipment as well as to analyze and interpret data.

CO4 : Understand the impact of engineering solutions in a global, economic, environmental and societal context.

CO5 : Gain the knowledge about fuels and lubricants.

UNIT-I: WATER TECHNOLOGY

(9)

Hardness-types and estimation by EDTA method (problems) - domestic water treatment –disinfection methods (chlorination, ozonation, and UV treatment) - boiler feed water (scale, sludge, priming, foaming and caustic embrittlement) - internal conditioning (carbonate, phosphate and calgon) -external conditioning – demineralization process-desalination – reverse osmosis method. Spectrophotometric determination of Fe in water, Flame emission spectroscopy – determination of sodium in water, Atomic absorption spectroscopy - determination of nickel – BOD and COD – definition, determination and significance.

UNIT-II: ELECTROCHEMISTRY AND BATTERIES

(9)

Introduction – cell terminology - electrode potential -Nernst equation and problems-reference electrode - standard hydrogen electrode (SHE) and calomel electrode - emf series and its applications-measurement of emf – reversible and irreversible cells- potentiometric titration (redox & precipitation)-conductometric titration (acid-base). Batteries -definition-characteristics and types-lead acid battery-nickel cadmium battery- fuel cells-flow battery.

UNIT-III: POLYMERS AND NANOMATERIALS

(9)

Polymers-definition – polymerization – types - addition, condensation and co polymerization - plastics-thermoplastics and thermosetting plastics-preparation , properties and uses of PVC, PET, Bakelite, epoxy resins, Teflon and nylon. Compounding of plastics. Polymer processing by compression, injection and blow moulding techniques. Nanomaterials – carbon nanotubes – classification, synthesis and their applications.

UNIT-IV: CORROSION AND CORROSION CONTROL

(9)

Chemical corrosion – Pilling – Bedworth rule – electrochemical corrosion – different types – galvanic corrosion – differential aeration corrosion – factors influencing corrosion – corrosion control – sacrificial anode and impressed cathodic current methods – corrosion inhibitors – protective coatings – paints – constituents and functions – metallic coatings – electroplating (Au) and electroless (Ni) plating.

UNIT-V: FUELS AND COMBUSTION**(9)**

Fuels - Calorific value–classification – Coal – proximate and ultimate analysis metallurgical coke – manufacture by Otto-Hoffmann method – Petroleum processing and fractions – knocking – octane number and cetane number – synthetic petrol – Fischer Tropsch and Bergius processes – Gaseous fuels- water gas, producer gas and LPG. Lubricants - properties– viscosity index, flash and fire points, cloud and pour points, oiliness) – solid lubricants– graphite and molybdenum sulphide. Flue gas analysis – Orsat apparatus – theoretical air for combustion (problems).

TOTAL: 45 PERIODS**TEXT BOOKS:**

1. P.C.Jain and Monica Jain, “Engineering Chemistry”, 15th ed., Dhanpat Rai Pub. Co., New Delhi, 2009.
2. S.S.Dara, “A Text book of Engineering Chemistry”, S. Chand & Co. Ltd., New Delhi, 2005.
3. Dr. A. Ravikrishnan, “Engineering Chemistry”, 13th ed., Sri Krishna Hitech publishing Co. Pvt. Ltd., Chennai, 2012.

REFERENCES:

1. N. Krishnamurthy, P. Vallinayagam and D. Madhavan, “Engineering Chemistry”, PHI learning private Ltd, New Delhi, 2009.
2. B. Sivashankar , “Engineering Chemistry”, Tata McGraw-Hill Pub. Co. Ltd. New Delhi, 2008.
3. R. Sivakumar and N. Sivakuamr, “Engineering Chemistry”, Tata McGraw-Hill publishing company limited, New Delhi, 2009.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x			x						x		
2	x	x		x	x					x	x	x
3		x		x	x					x	x	x
4	x	x				x	x	x				x
5												



13GE105 - ENGINEERING GRAPHICS
(Common to B.E- ECE, EEE, EIE, CSE, CIVIL & B. Tech.- IT Programmes)

L	T	P	C
3	0	0	3

OBJECTIVES:

- To develop graphic skill in students for communication of concepts, ideas and design of engineering products and expose them to standards related to technical drawing.

COURSE OUTCOMES:

At the end of the course, the students will be able to

- CO1 : Use the drawing instruments effectively.
- CO2 : Draw the basic engineering curves and problems related to projections of points, straight lines, planes and solids.
- CO3 : Apply the knowledge acquired on practical applications of sectioning and development of solids.
- CO4 : Draw simple solids and its sections in isometric view and projections and also to draw its perspective views.
- CO5 : Draw the Perspective projection of prisms, pyramids and cylinders.

CONCEPTS AND CONVENTIONS

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

UNIT - I GEOMETRICAL CONSTRUCTIONS AND PLANE CURVES (9+3)

Geometrical constructions: Dividing a given straight line into any number of equal parts, bisecting a given angle, drawing a regular polygon given one side, special methods of constructing a pentagon and a hexagon Curves used in engineering practices: Conics - Construction of ellipse, Parabola and hyperbola by eccentricity method - Construction of cycloid - construction of involutes of a circle and circle - Drawing of tangents and normal to the above curves.

UNIT - II PROJECTION OF POINTS, LINES AND PLANE SURFACES (9+3)

Projection of points and straight lines located in the first quadrant - Determination of true lengths and true inclinations - Projection of polygonal surface and circular lamina inclined to both reference planes.

UNIT - III PROJECTION OF SOLIDS (9+3)

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

UNIT – IV SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES (9+3)

Sectioning of above solids 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 cones- Development of lateral surfaces of solids with cylindrical cutouts, perpendicular to the axis.

UNIT - V ISOMETRIC, PERSPECTIVE PROJECTIONS & BUILDING DRAWING (9+3)

Principles of isometric projection - isometric scale - isometric projections of simple solids, truncated prisms, pyramids, cylinders and cones. Perspective projection of prisms, pyramids and cylinders by visual ray method. Plan, elevation and section of single storied residential building with flat RCC roof and brick masonry walls having not more than 2 rooms. Free hand sketching in isometric projection.

TOTAL: 60 PERIODS

REFERENCES:

1. K. Venugopal and V. Prabhu Raja, “Engineering Drawing + AutoCAD”, 5th ed., New Age International, Reprint 2011.
2. Basant Agarwal and Agarwal C.M., “Engineering Drawing”, Tata McGraw Hill Publishing Company Limited, New Delhi, 2008.
3. K. V. Natrajan, “A text book of Engineering Graphics”, Dhanalakshmi Publishers, Chennai 2006.
4. M.S. Kumar, “Engineering Graphics”, D.D. Publications, 2007.
5. N.D. Bhatt, “Engineering Drawing”, Charotar Publishing House, 2011.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x										
2				x								
3					x							
4					x							
5								x	x			



13CS101 - PROBLEM SOLVING & C PROGRAMMING
(Common to All B.E/ B. Tech. Programmes)

L	T	P	C
3	0	0	3

OBJECTIVES :

- To know the correct and efficient ways of solving problems.
- To learn the basics of C declarations, operators and expressions.
- To work on all the elementary statements (Loop, Branch) and arrays.
- To learn on the manipulation of strings, functions and pointers.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Acquire the basic knowledge of computer hardware and software.

CO2 : Implement software development tools like algorithms, flowcharts, etc.

CO3 : Design programs involving decision structures, loops and functions.

CO4 : Find solution for various problems using the features of C language.

CO5 : Develop simple C programs using structures, pointers, memory allocation and file handling.

UNIT-1 INTRODUCTION TO COMPUTERS (9)

Computer Basics - Applications of Computer - Computer organization - Number systems - Computer Software- Types of software - Software Development steps - Basic Internet terminologies- Introduction to Office packages.

UNIT-2 PROBLEM SOLVING & PROGRAMMING (9)

Creative Thinking & Problem solving skills - Problem solving concepts for Computers, Algorithms & Flowchart - Programming languages - Writing the first C Program, IDE, Compiler error, Linker error - Overview of C - Constants, Variables, Data Types and Storage Class- Operators and Expressions.

UNIT-3 LOOP & CASE LOGIC STRUCTURES AND FUNCTIONS (9)

Managing Input and Output operations - Control structures - Selection structures, Iteration Structures - Nested Loop structures - Control Transfer Statements- Functions - Elements of User defined Functions, Function Prototypes, Parameter Passing Techniques, Passing Array to Functions, Recursive Functions.

UNIT-4 POINTERS & ARRAYS (9)

Pointer concepts- Pointers & Arrays - Pointers to Functions - Array concepts - 1-D , 2-D, 3-D & Dynamic Array - Strings - The Preprocessor.

UNIT-5 STRUCTURES, UNIONS AND FILES (9)

Structure concepts - Defining, Declaring, Accessing Member Variables, Structures using Pointers, Passing Structures to Functions, Structure within Structure - Union - File Management in C - Dynamic Memory Allocation.

TOTAL : 45 PERIODS

TEXT BOOKS :

1. Yashavant Kanetkar, "Let us C", 3rd ed., BPB publications, New Delhi, 2011.
2. E.Balagurusamy, "Fundamentals of computing and programming", 2nd ed., Tata McGraw-Hill Publishing Company Limited, 2012.

REFERENCE BOOKS:

1. N.Ashok and Kamthane, "Computer Programming", 2nd ed., Pearson Education (India), 2012.
2. S Byron and Gottfried, "Programming with C", 2nd ed., Tata McGraw-Hill, 2006.
3. R.G Dromey, "How to Solve it by Computer", 4th Reprint, Pearson Education, 2007.
4. B.W Kernighan and D.M Ritchie, "The C Programming language", 2nd ed., Pearson Education, 2006.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x										
2	x	x	x		x					x		
3	x	x			x					x	x	
4	x	x					x				x	x
5	x	x	x	x			x				x	x



13GE111-PHYSICS AND CHEMISTRY LABORATORY-I
(Common to All B.E/ B. Tech. Programmes)

L	T	P	C
0	0	3	2

PHYSICS LABORATORY- I

OBJECTIVES:

- To provide the basic practical exposure to all the engineering and technological streams in the field of physics
- The students are able to know about the water containing impurities and some physical parameters.

COURSE OUTCOMES:

At the end of the course, the students will be able to

- CO1 : Acquire the fundamental knowledge in optics such as interference, Diffraction and understand about the spectral instruments etc.
- CO2 : Gain the basic knowledge about handling the laser light and identify the basic parameters of an optical fibre.
- CO3 : Analyse the properties of matter with sound waves.
- CO4 : Apply knowledge of measurement of hardness producing ions, chloride, alkalinity, DO, conductance, EMF and pH.
- CO5 : Understand the impact of water quality and solve engineering problems.

LIST OF EXPERIMENTS

1. (a) Determination of wavelength , particle size using Laser
(b) Determination 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 wavelength of mercury spectrum – spectrometer grating.
5. Determination of thermal conductivity of a bad conductor – Lee’s Disc method.
6. Determination of Hysteresis loss in a ferromagnetic material

CHEMISTRY LABORATORY – I

LIST OF EXPERIMENTS

1. Estimation of hardness of Water by EDTA
2. Determination of DO in water (Winkler’s method)
3. Estimation of Chloride in Water sample (Argentometric)
4. Conductometric Titration of strong acid vs. strong base.
5. Conductometric precipitation titration using Barium chloride and sodium sulphate.
6. Determination of molecular weight and degree of polymerization using viscometry.

Note:

- A minimum of FIVE experiments shall be offered in both physics and chemistry lab.
- Laboratory classes on alternate weeks for Physics and Chemistry.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x		x		x	x			x	x	
2	x	x		x			x					
3	x	x		x								
4	x	x		x		x	x					
5	x	x		x		x	x					



13GE112- ENGINEERING PRACTICES LABORATORY
(Common to All B.E/ B. Tech. Programmes)

L	T	P	C
0	0	3	2

OBJECTIVES:

- To provide exposure to the students with hands on experience on various basic engineering practices in Civil, Mechanical, Electrical and Electronics Engineering.
- To understand the basic working principle of electric devices and electronic components.
- To understand and operate multimeter for current, voltage and resistance measurements.
- Have the knowledge and technical skills required to be and to remain productive in the field of Electrical Engineering.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Understand various civil engineering practices like plumbing, carpentry and relevant tools

CO2 : Understand various manufacturing processes

CO3 : Get familiarity with the instruments such as CRO, Function generator, single and dual power supply, multi-meter, bread board, IC's, and components such as diodes, transistors, resistors, capacitors, inductors, etc.

CO4 : Get familiarity with the testing of capacitors, diodes, transistors with Analog multi-meter or Digital multimeter. Understand the principles of electrical circuits and electronics, and analysis, synthesis, and experimental techniques for both analog and digital electronic circuits

CO5 : Do residential house wiring and Measure energy and resistance to earth of an electrical equipment.

GROUP-A (MECHANICAL AND CIVIL ENGINEERING)

I - CIVIL ENGINEERING PRACTICE

(9)

Buildings:

- (a) Study of plumbing and carpentry components of residential and industrial buildings. Safety aspects.

Plumbing Works:

(a) Study of pipeline joints, its location and functions: valves, taps, couplings, unions, reducers, elbows in household fittings.

(b) Study of pipe connections requirements for pumps and turbines.

(c) Preparation of plumbing line sketches for water supply and sewage works.

(d) Hands-on-exercise:

Basic pipe connections – Mixed pipe material connection – Pipe connections with different joining components.

(e) Demonstration of plumbing requirements of high-rise buildings.

Carpentry using Power Tools only:

(a) Study of the joints in roofs, doors, windows and furniture.

(b) Hands-on-exercise: Wood work, joints by sawing, planing and cutting.

II MECHANICAL ENGINEERING PRACTICE

(13)

Welding:

- (a) Preparation of arc welding of butt joints, lap joints and tee joints.
- (b) Gas welding practice

Basic Machining:

- (a) Simple Turning and Taper turning
- (b) Drilling Practice

Sheet Metal Work:

- (a) Forming & Bending:
- (b) Model making – Trays, funnels, etc.
- (c) Different type of joints.

Machine assembly practice:

- (a) Study of centrifugal pump
- (b) Study of air conditioner

Demonstration on:

- (a) Smithy operations, upsetting, swaging, setting down and bending. Example – Exercise – Production of hexagonal headed bolt.
- (b) Foundry operations like mould preparation for gear and step cone pulley.
- (c) Fitting – Exercises – Preparation of square fitting and vee – fitting models.

GROUP-B (ELECTRICAL AND ELECTRONICS)

ELECTRICAL ENGINEERING PRACTICE

Residential house wiring using switches, fuse, indicator, lamp and energy meter.

1. Fluorescent lamp wiring.
2. Stair case wiring
3. Measurement of electrical quantities – voltage, current, power & power factor in RLC circuit.
4. Measurement of energy using single phase energy meter.
5. Measurement of resistance to earth of electrical equipment.

ELECTRONICS ENGINEERING PRACTICE

- (a). Study of Electronic components and equipments – Resistor (Colour coding), Inductor, Capacitor.
- (b). Measurement of AC signal parameter (peak-peak, RMS period, frequency) using CRO.
- (c). Study of logic gates AND, OR, XOR and NOT.
- (d). Study of Clock Signal.
- (e). Soldering practice – Components Devices and Circuits – Using general purpose PCB.
- (f). Study of HWR and FWR.
- (g). Study of Telephone, FM Radio and Cell Phone.

TOTAL: 45 PERIODS

REFERENCES:

1. K Jeyachandran, S Natarajan and S Balasubramanian, “A Primer on Engineering Practices Laboratory”, Anuradha Publications, 2007.
2. T Jeyapoovan, M Saravanapandian and S Pranitha, “Engineering Practices Lab Manual”, Vikas Publishing House Pvt.Ltd, 2006.
3. H S Bawa, “Workshop Practice”, Tata McGraw – Hill Publishing Company Limited, 2007.
4. A Rajendra Prasad and P.M.M.S Sarma., “Workshop Practice”, Sree Sai Publication, 2002.
5. P Kannaiah and K L Narayana, “Manual on Workshop Practice”, Scitech Publications, 1999.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x		x	x						x	x	
2	x	x	x	x							x	x
3	x	x	x	x							x	x
4	x	x	x							x	x	x
5	x	x	x	x							x	x



13CS111 - COMPUTER PROGRAMMING LABORATORY
(Common to All B.E/ B. Tech. Programmes)

L	T	P	C
0	0	3	2

OBJECTIVES :

- To learn about Office tools for developing Applications.
- To understand about open source tool to solve problem in an efficient way.
- To learn the basics of C declarations, operators and expressions.
- To work on all the elementary statements (Loop, Branch) and arrays.
- To learn on the manipulation of strings, functions and pointers.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Write, compile and debug programs in C language.

CO2 : Effectively choose programming components that efficiently solve computing problems in real-world.

CO3 : Apply and practice logical ability to solve the problems.

CO4 : Understand C programming development environment, compiling, debugging, linking and executing a program using the development environment.

CO5 : Understand and apply the pointers, memory allocation techniques and use of files for dealing with variety of problems.

Word Processing

1. Document creation, Text manipulation with Scientific notations.
2. Table creation, Table formatting and Conversion.
3. Mail merge and Letter preparation

Spread Sheet

4. Chart - Line, XY, Bar and Pie.
5. Formula - formula editor

RAPTOR –Tool

6. Drawing - flow Chart

C-Programming

7. Program Using Operators, Expressions and IO formatting
8. Program Using Decision Making and Looping
9. Program Using Arrays and Strings
10. Program Using Functions and Recursion
11. Program Using Structures and Unions
12. Program Using Pointers and Files

HARDWARE / SOFTWARE REQUIRED FOR A BATCH OF 30 STUDENTS

Hardware

- LAN System with 33 nodes (OR) Standalone PCs – 33 Nos.
- Printers – 3 Nos.

Software

- OS – Windows / UNIX Clone
- Application Package – Office suite
- Compiler – C

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x										
2	x	x	x		x					x		
3	x	x			x					x	x	
4	x	x					x				x	x
5	x	x	x	x			x				x	x



13GE201 - ENGLISH FOR ENGINEERS - II
(Common to All B.E/B. Tech Programmes)

L	T	P	C
3	1	0	4

OBJECTIVES :

- To enable students to convert the conceptual understanding of communication into everyday practice
- To create a learner-language interface enabling students to exercise control over language use
- To make students reflect and improve their use of body language – posture, gesture, facial expression, tone
- To build students understand the concept and components of personality, thereby to apply the acquired knowledge to themselves and to march towards excellence in their respective academic careers.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Develop communicative proficiency by articulating words and sentences undoubtedly.

CO2 : Interpret different accents and modulations through active listening and effective reading.

CO3 : Prepare, organize, and deliver an engaging oral presentation and articulate their own ideas in relation to other voices and ideas.

CO4 : Write effectively for a variety of professional and social settings.

CO5 : Understood the significance of soft skills in the working environment

UNIT I LANGUAGE SKILLS

(9+3)

General Vocabulary –Vocabulary building activities- Subject – Verb Agreement- Error correction- Common Errors in English - If conditionals - Cause and Effect Expressions - Idioms and Phrases - Style- One Word Substitution, Purpose and means, Homophones and Homonyms

UNIT II PROFESSIONAL LISTENING AND READING

(9+3)

Listening to interviews - Intensive listening to fill up gapped text-Listening to criticize information - Drawing inferences and conclusions- Statement and assumption, statement and conclusion-Reading advertisements, newspapers and interpreting

UNIT III COMMUNICATION BOOSTERS

(9+3)

Conversation and oral skills- Improving fluency an self expression- Body Language - Situational role plays- Impromptu speeches - Planning, Preparing and organizing presentation-Group Discussion – advertising and persuading

UNIT IV PROFESSIONAL WRITING

(9+3)

Resumes and Job Applications-Report Writing-Memo, Agenda and minutes-Checklist-Letters inviting dignitaries, accepting and declining invitation

UNIT V SOFT SKILLS

(9+3)

Leadership and interpersonal skills – Time Management – Intercultural Communication – Telephone Etiquettes – Assertive skills – Adaptability skills – Team work-Etiquette in LSRW - Public speaking skills.

TOTAL : 60 PERIODS

Note:

Listening and speaking activities will be done using Communication Lab and teaching materials will be elicited from various resources with required worksheets to be used in the class

Exercises to be completed in communication lab

1. Listen to a Noble Lecture for non-verbal communication and make a record of observation.
2. Listening to Interview and taking part in Mock Interview
3. Listening to GD and taking part in Mock GD
4. Listening to News on the Radio & Television
5. Reading Newspaper and Interpreting.
6. Intensive listening to fill up gapped text.
7. Listen and complete the conversation.

TEXT BOOKS

1. M A Rizvi, "Effective Technical Communication", Tata McGraw Hill Publishing Company Limited, New Delhi, 2006.
2. Department of English, Anna University. "Mindscapes: English for Technologists and Engineers", Orient Blackswan, Chennai. 2012.

REFERENCE BOOKS

1. M Raman and Sangeetha Sharma, "Technical Communication", Oxford University Press, USA, 2005.
2. S.P Dhanavel, "English and Communication Skills for Students of Science and Engineering", Orient Blackswan, Chennai. 2011.
3. S.P Dhanavel, "English and Soft skill", Orient Blackswan Pvt. Ltd., 2010.
4. Gerson, J Sharon and Steven M. Gerson, "Technical Writing –Process and Product", Pearson Education, 2001.
5. Aeda Abidi and Ritu Chowdary, "English For Engineers Made Easy", Cengage India Learning Limited, New Delhi, 2010.

Extensive reading for Internal evaluation

Students have to read the text "You can win" by Shiv Kera and do a review presentation for Internal Assessment.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1									x	x		x
2									x	x	x	x
3									x	x		x
4									x	x		x
5									x	x	x	x



13GE202 - ENGINEERING MATHEMATICS - II
(Common to All B.E/ B.Tech. Programmes)

L	T	P	C
3	1	0	4

OBJECTIVES:

To enable students to

- Apply knowledge of Mathematics in Engineering.
- Communicate problem solutions using correct Mathematical terminology.
- Apply rigorous and analytic approach to analyze and solve differential equations.

COURSE OUTCOMES:

At the end of the course, the students will be able to

- CO1 : Have learnt the methods of double and triple integration, which are needed in their studies in other areas and gained confidence to handle integrals of higher orders.
- CO2 : Have studied the basics of vector calculus comprising of gradient, divergence and curl and line, surface and volume integrals and the classical theorems involving them, which would be encountered by them in their engineering subjects in the same or higher semesters.
- CO3 : Have a good grasp of analytic functions and their interesting properties which could be exploited in a few engineering areas and be introduced to the host of conformal mappings with a few standard examples that have direct application.
- CO4 : Have grasped the basis of complex integration and the concept of contour integration which is an important tool for evaluation of certain integrals encountered in practice.
- CO5 : Have a sound knowledge of Laplace transform and its properties and sufficient exposure to solution of certain linear differential equations using the Laplace transform techniques which have applications in other subjects of the current and higher semesters.

UNIT I:ORDINARY DIFFERENTIAL EQUATIONS AND APPLICATIONS (9 + 3)

Higher order linear differential equations with constant coefficients – Method of variation of parameters – Homogeneous equation of Euler's and Legendre's type – System of first order Simultaneous equations-Simple Harmonic Motion – Electric Circuits – Resisting medium.

UNIT II:VECTOR CALCULUS (9 + 3)

Gradient and Directional derivative - Divergence and Curl – Irrotational and solenoidal vector fields – Line integral over a plane curve – Surface integral and volume integral - Green's ,Gauss divergence and Stokes theorem(excluding proofs) – Verification and application in evaluating line, surface and volume integrals.

UNIT III:ANALYTIC FUNCTIONS (9 + 3)

Functions of a complex variable - Analytic functions – Necessary and sufficient conditions for analyticity(excluding proofs) – Properties – Harmonic conjugate – Construction of analytic function – Conformal mapping –Mapping by functions: $w = z + c$, cz , $1/z$, z^2 and bilinear transformation.

UNIT IV:COMPLEX INTEGRATION (9 + 3)

Line integrals-Cauchy's integral theorem and integral formula – Taylor's and Laurent's series - Singularities - Classification – Residues – Residue theorem – Application of residue theorem to evaluate real integrals – Use of circular contour and semi-contour with no pole on real axis.

UNIT V:LAPLACE TRANSFORM (9 + 3)

Laplace transform – Conditions for existence – Transform of elementary functions – Basic properties – Initial and Final value theorems – Transform of periodic functions and its application.

Inverse Laplace transforms -Convolution theorem (excluding proof)– Applications of Laplace transform for differential equations for 2nd order with constant co-efficients.

TOTAL : 60 PERIODS

TEXT BOOKS:

1. N.P.Balaji and Manish Goyal, "A text book of, Engineering Mathematics: Sem-II", 5th ed., Laxmi Publications, 2011.
2. T Veerarajan, "Engineering Mathematics for first year", 3rd ed., Tata McGraw Hill, 2011.
3. P Kandasamy, K Thilagavathy and K Gunavathy., "Engineering Mathematics for first year", 7th Rv. ed., S. Chand & Co Ltd, 2010.

REFERENCES:

1. B.S.Grewal, "Higher Engineering Mathematics", 40th ed., Khanna publications, 2007.
2. Erwin Kreyszig, "Advanced Engineering Mathematics", 8th ed., John Wiley & sons, 2001.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x						x	x	x
2	x	x	x		x			x		x	x	x
3	x	x	x	x			x	x		x	x	
4	x	x	x			x				x	x	x
5	x	x	x	x	x					x	x	x



13GE203 - ENGINEERING PHYSICS - II
(For Circuit Branches)

L	T	P	C
3	0	0	3

OBJECTIVES:

The objective of this course is to develop the skills of the students in Material science under various topics. This will provide the basic ideas in large number of engineering subjects like Electrical conduction, Semiconductors and Devices, Electronic devices, Nano technology, etc.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Electric conduction, electrical conductivity, carrier concentration of metals.

CO2 : Semiconductors, carrier concentration of semiconductors, Hall Effect and semiconductor devices.

CO3 : Types of magnetic materials, ferro magnetic materials, magnetic storage devices, Super conductors and their properties and applications.

CO4 : Dielectrics, properties and its applications, ferro electricity.

CO5 : Modern engineering materials, Nano materials and Carbon nano tubes.

UNIT I: CONDUCTING MATERIALS

(9)

Introduction- Derivation of microscopic form of Ohm's law- postulates of classical free electron theory- derivation of electrical conductivity of metals (Drude- Lorentz theory)- merits and demerits. Derivation of thermal conductivity – Weidman – Franz law- verification. Electron energies in metal and Fermi energy- Fermi-Dirac distribution function and its variation with temperature- density of energy states- calculation of density of electron and Fermi energy at 0K- average energy of free electron at 0K- Importance of Fermi energy- problems

UNIT II: SEMICONDUCTING MATERIALS & DEVICES

(9)

Intrinsic semiconductor – carrier concentration derivation – Fermi level – Variation of Fermi level with temperature – electrical conductivity – band gap determination – extrinsic semiconductors – carrier concentration derivation in n-type and p-type semiconductor – variation of Fermi level with temperature and impurity concentration – compound semiconductors – Hall effect – Determination of Hall coefficient – Applications.

UNIT III: MAGNETIC AND SUPERCONDUCTING MATERIALS

(9)

Origin of magnetic moment – Bohr magneton – Dia and para magnetism – Ferro magnetism – Domain theory – Hysteresis – soft and hard magnetic materials – anti – ferromagnetic materials – Ferrites – applications – magnetic recording and readout – storage of magnetic data – tapes, floppy and magnetic disc drives. Superconductivity : properties - Types of super conductors – BCS theory of superconductivity (Qualitative) - High T_c superconductors – Applications of superconductors – SQUID, cryotron, magnetic levitation.

UNIT IV: DIELECTRIC MATERIALS

(9)

Electrical susceptibility – dielectric constant – electronic, ionic, orientational and space charge polarization – frequency and temperature dependence of polarization – internal field – Claussius – Mosotti relation (derivation) – dielectric loss – dielectric breakdown – uses of dielectric materials (capacitor and transformer) – ferroelectricity and applications.

UNIT V : MODERN ENGINEERING MATERIALS

(9)

Metallic glasses: preparation, properties and applications. Shape memory alloys (SMA): Characteristics, properties of NiTi alloy, application, advantages and disadvantages of SMA. Nanomaterials: synthesis – plasma arcing – chemical vapour deposition – sol-gels – electrodeposition – ball milling - properties of nanoparticles and applications. Carbon nanotubes: fabrication – arc method – pulsed laser deposition – chemical vapour deposition - structure – properties and applications.

TOTAL : 45 PERIODS

TEXT BOOKS

1. V.Rajendran, "Engineering Physics", Tata McGraw-Hill.New Delhi, 2011.
2. P.K Palanisamy, "Materials science", 2nd ed., Scitech publications (India) Pvt. Ltd., Chennai, 2007.

REFERENCES

1. S Jayakumar, "Materials science", R.K. Publishers, Coimbatore, 2008.
2. K. Tamilarasan and K. Prabu, "Engineering Physics II", 2nd ed., Tata McGraw-Hill, New Delhi, 2011.
3. M. Arumugam, "Materials Science", Anuradha publications, Kumbakonam, 2006.
4. G Senthilkumar , " Engineering Physics- II", VRB Publications, 2011.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x											x
2	x	x		x			x					x
3	x		x				x	x				x
4	x		x	x			x	x				x
5	x	x	x	x			x					x



13GE204 - ENVIRONMENTAL SCIENCE AND ENGINEERING
(Common to All B.E/ B.Tech. Programmes)

L	T	P	C
3	0	0	3

OBJECTIVES :

- To understand the constituents of the environment.
- The students should be conversant with valuable resources
- To know about the role of a human being in maintaining a clean environment.
- To maintain ecological balance and preserve bio-diversity.
- To get knowledge about the conservation of environment for the future generation.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Design a system, component, or process to meet desired needs

CO2 : Identify, formulate, and solve environmental engineering problems

CO3 : Understand the professional and ethical responsibility as related to the practice of environmental engineering and the impact of engineering solutions in a global context

CO4 : Use the techniques, skills, and modern engineering tools necessary for environmental engineering practice.

CO5 : Acquire the knowledge of information technology in environmental science.

UNIT- I INTRODUCTION TO ENVIRONMENTAL STUDIES AND NATURAL RESOURCES
(9)

Environment: definition-scope-importance-need for public awareness. Forest resources: Use-over exploitation-deforestation-mining-effects on forests and tribal people. Water resources: Use-over utilization of surface and ground water –floods-drought- conflicts over water. Mineral resources: Use-exploitation-environmental effects of extracting and using mineral resources-Food resources: World food problems changes caused by agriculture and overgrazing –effects of modern agriculture-fertilizer-pesticide problems-water logging-salinity-Energy resources: Growing energy needs-renewable energy sources-use of alternate energy sources. Land resources: Land as a resource-land degradation-man induced landslides-soil erosion and desertification. Role of an individual in conservation of natural resources.

UNIT- II ECOSYSTEMS AND BIODIVERSITY
(9)

Concept of an ecosystem: structure and function of an ecosystem-Producers-decomposers-Energy flow in the ecosystem-Ecological succession Food chains-food webs and ecological pyramids. Types of ecosystem: Introduction-characteristic features-Forest ecosystem-Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) Biodiversity: Introduction-definition (genetic-species-ecosystem) diversity. Value of biodiversity: consumptive use-productive use-social values-ethical values-aesthetic values. Biodiversity level: global-National-local levels. India as a mega diversity nation. Hotspots of biodiversity .Threats to biodiversity: habitat loss-poaching of wildlife –man wildlife conflicts-Endangered and endemic species of India. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT - III ENVIRONMENTAL POLLUTION
(9)

Pollution: Definition-Air pollution-Water pollution-Soil pollution-Noise pollution-Thermal pollution-Nuclear hazards. Soil waste management: Causes-effects-control measures of urban and industrial wastes. Role of an individual in prevention of pollution - Pollution case studies. Disaster managements: floods-earthquake-cyclone-landslides.

UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT**(9)**

Sustainable development-form unsustainable development-Urban problems related to energy. Water conservation-rain water harvesting-watershed management. Resettlement and rehabilitation of people: its problems-concerns. Environmental ethics: Issues-possible solutions-Climate change-global warming-acid rain-ozone layer depletion-nuclear accidents-nuclear holocaust. 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.

UNIT V HUMAN POPULATION AND THE ENVIRONMENT**(9)**

Population growth - variation among nation- 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 PERIODS**TEXT BOOKS:**

1. Anubha Kaushik and C.P. Kaushik,” Environmental Science and Engineering”, New Age International Publishers, New Delhi ,2006.
2. Raman Sivakumar,” Introduction to Environmental Science and Engineering”, Tata McGraw Hill Education Private Limited, New Delhi ,2011.
3. Dr.A Ravikrishnan, “Environmental Science and Engineering”, 8th ed.,Sri Krishna Hitech publishing Co.Pvt .Ltd., 2012.

REFERENCE BOOKS:

1. M Masters Gilbert, “Introduction to Environmental Engineering and Science”, 2nd ed., Pearson Education, New Delhi, 2004.
2. Santosh Kumar Garg, Rajeshwari garg and Smf Ranjni Garg, “Ecological and Environmental Studies”,Khanna Publishers, Nai Sarak, Delhi ,2006.
3. T G Miller, “Environmental Science”, 10th ed., Wadsworth Publishing Co., 2004.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x		x	x						x	x	
2	x	x	x	x		x	x	x			x	
3	x	x				x	x	x			x	x
4	x	x		x	x	x	x	x		x	x	x
5	x	x		x	x	x	x				x	x



Approved by Fourth Academic council

13EC202 - DIGITAL PRINCIPLES AND SYSTEM DESIGN
(Common to CSE & IT Branches)

L	T	P	C
3	0	0	3

OBJECTIVES:

- To learn the basic methods for the design of digital circuits and provide the fundamental concepts used in the design of digital systems.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Learn how to design digital circuits, by simplifying the Boolean functions.

CO2 : Give an idea about Combinational Circuit and HDL basics

CO3 : Can Design the Synchronous Sequential Circuits

CO4 : Can Design the Asynchronous Sequential Circuits

CO5 : Give an idea about designs using PLDs, and write codes for designing larger digital systems.

UNIT I BOOLEAN ALGEBRA AND LOGIC GATES (9)

Review of Number Systems – Arithmetic Operations – Binary Codes – Boolean Algebra and Theorems – Boolean Functions – Simplification of Boolean Functions using Karnaugh Map and Tabulation Methods – Logic Gates – NAND and NOR Implementations.

UNIT II COMBINATIONAL LOGIC (9)

Combinational Circuits – Analysis and Design Procedures – Circuits for Arithmetic Operations, Code Conversion – Decoders and Encoders – Multiplexers and De multiplexers – Introduction to HDL – HDL Models of Combinational circuits.

UNIT III SYNCHRONOUS SEQUENTIAL LOGIC (9)

Sequential Circuits – Latches and Flip Flops – Analysis and Design Procedures – State Reduction and State Assignment – Shift Registers – Counters – HDL for Sequential Logic Circuits.

UNIT IV ASYNCHRONOUS SEQUENTIAL LOGIC (9)

Analysis and Design of Asynchronous Sequential Circuits – Reduction of State and Flow Tables – Race-free State Assignment – Hazards.

UNIT V MEMORY AND PROGRAMMABLE LOGIC (9)

RAM and ROM – Memory Decoding – Error Detection and Correction – Programmable Logic Array – Programmable Array Logic – Sequential Programmable Devices – Application Specific Integrated Circuits.

TOTAL: 45 PERIODS

TEXT BOOK:

1. M Morris Mano and Michael D. Ciletti, “Digital Design”, 4th ed., Pearson Education, 2008.

REFERENCES:

1. John F. Wakerly, “Digital Design Principles and Practices”, 4th ed., Pearson Education, 2007.
2. Charles H. Roth Jr, “Fundamentals of Logic Design”, 5th ed., Jaico Publishing House, Mumbai, 2003.
3. Donald D. Givone, “Digital Principles and Design”, Tata McGraw Hill, 2003.
4. Kharate G. K., “Digital Electronics”, Oxford University Press, 2010.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x				x	x		x	x
2	x	x	x	x	x			x	x		x	x
3	x	x	x	x	x			x	x		x	x
4	x	x	x	x	x		x	x	x		x	x
5	x	x	x	x			x		x		x	x



Approved by Fourth Academic council

13CS201 - DATA STRUCTURES
(Common to CSE & IT Branches)

L	T	P	C
3	0	0	3

OBJECTIVES:

- To learn the systematic way of solving problems.
- To understand the different methods of organizing large amounts of data.
- To efficiently implement the different data structures.
- To efficiently implement solutions for specific problems.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Understand the basics of data structures.

CO2 : Exemplify how abstract data type linked list can be implemented

CO3 : Know how to implement stack and queues.

CO4 : Understand and distinguish the conceptual and applicative differences in trees.

CO5 : Design various routing algorithms using appropriate data structures.

UNIT- I PROBLEM SOLVING (9)

Problem solving – Top-down Design – Implementation – Verification – Efficiency – Analysis –Sample algorithms.

UNIT- II LISTS, STACKS AND QUEUES (9)

Abstract Data Type (ADT) – The List ADT – The Stack ADT – The Queue ADT-Applications of List, Stack, Queue ADT.

UNIT- III TREES (9)

Definitions – Binary Trees – The Search Tree ADT – Binary Search Trees – AVL Trees – Tree Traversals –Hashing – General Idea – Hash Function – Priority Queues (Heaps) – Model – Simple implementations –Binary Heap.

UNIT- IV SORTING & SEARCHING (9)

Preliminaries – Insertion Sort – Shell sort – Heap sort – Merge sort – Quick sort – External Sorting - Searching: Sequential search - Binary Search.

UNIT- V GRAPHS (9)

Definitions – Traverse Graph: Depth first Traversal-Breadth first Traversal-Shortest Path Algorithms: Unweighted Shortest Paths – Dijkstra's Algorithm. Minimum Spanning Tree: Prim's Algorithm–Kruskal's Algorithm-Introduction to NP-Completeness.

TOTAL : 45 PERIODS

TEXT BOOKS:

1. R. G. Dromey, "How to Solve it by Computer" (Chaps 1-2), Prentice-Hall of India, 2002.
2. M. A. Weiss, "Data Structures and Algorithm Analysis in C", 2nd ed., Pearson education Asia, 2002.

REFERENCES:

1. F Richard, Gilberg and Behrouz A. Forouzan, "Data Structures – A Pseudocode Approach with C", Thomson Brooks / COLE, 1998.
2. Y. Langsam, M. J. Augenstein and A. M. Tenenbaum, "Data Structures using C", Pearson Education Asia, 2004.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x	x							x
2	x	x	x	x	x							x
3	x	x	x	x	x							x
4	x	x	x	x	x							x
5	x	x	x	x	x		x				x	x



13GE211-PHYSICS AND CHEMISTRY LABORATORY- II
(Common to All B.E/ B. Tech. Programmes)

L	T	P	C
3	0	0	3

PHYSICS LABORATORY- II

OBJECTIVES:

- To provide the basic practical exposure to all the engineering and technological streams in the field of physics
- The students are able to know about the water containing impurities and some physical parameters.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Acquire the practical knowledge in various moduli.

CO2 : Gain the practical knowledge about band gap of a semiconductor and optoelectronic devices and Understand about the spectral instruments.

CO3 : Analyze the properties of matter and determine the thermal conductivity of a material.

CO4 : Apply knowledge of measurement of conductance, hardness producing ions, alkalinity, conductance, EMF and pH

CO5 : Understand the impact of water quality and to solve engineering problems.

LIST OF EXPERIMENTS

1. Determination of Young's modulus of the material – non uniform bending.
2. Determination of Band Gap of a semiconductor material.
3. Determination of viscosity of liquid – Poiseuille's method.
4. Spectrometer dispersive power of a prism.
5. Determination of Young's modulus of the material – uniform bending.
6. Tensional pendulum – Determination of rigidity modulus.

CHEMISTRY LABORATORY – II

LIST OF EXPERIMENTS

1. Estimation of alkalinity of Water sample.
2. Estimation of Copper in brass by EDTA.
3. Conductometric titration of mixture of acids.
4. Estimation of iron by potentiometry.
5. Estimation of hydrochloric acid by pH metry.
6. Estimation of iron by spectrophotometry.
7. Determination of water for crystallization of copper sulphate.

Note:

- A minimum of FIVE experiments shall be offered in both physics and chemistry lab.
- Laboratory classes on alternate weeks for Physics and Chemistry.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x		x		x	x			x	x	
2	x	x		x			x					
3	x	x		x								
4	x	x		x		x	x					
5	x	x		x		x	x					



Approved by Fourth Academic council

13CS211- DATA STRUCTURES LAB
(Common to CSE & IT Branches)

L T P C
0 0 3 2

OBJECTIVES:

- To learn about linear and non linear data structure.
- To understand about different sorting and searching techniques.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Create a simple data structure.

CO2 : Implement linked list and perform other manipulations in it.

CO3 : Understand about evaluation of expressions and checking balanced parenthesis by compiler.

CO4 : Design and implement tree data structure and ways to traverse the tree.

CO5 : Find a route in a given graph using DFS and BFS.

LIST OF PROGRAMS

1. Implementation of singly linked list
2. Implementation of Doubly linked list
3. Implementation of Polynomial addition using List ADT
4. Array implementation of Stack and Queue ADT
5. Linked list implementation Stack and Queue ADT
6. Implementation of stack applications:
 - (a) Program for Balanced Parenthesis
 - (b) Program for Evaluating Postfix Expressions
7. Implementation of Binary tree traversals
8. Search Tree ADT - Binary Search Tree
9. Heap Sort
10. Quick Sort
11. Implementation of Breadth First Search Techniques
12. Implementation of Depth First Search Techniques

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x							x	x
2	x	x	x	x								x
3	x	x	x	x								x
4	x	x	x	x								x
5	x	x	x	x	x		x				x	x



13EC212 - DIGITAL LABORATORY
(Common to CSE & IT Branches)

L T P C
0 0 3 2

OBJECTIVES:

- To impart the concepts of digital electronics practically and train students with all the equipments which will help in improving the basic knowledge.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Appreciate Boolean algebraic expressions to digital design.

CO2 : Understand the importance and theory of digital electronics.

CO3 : Design and develop digital combinational circuits.

CO4 : Analyze and implement sequential digital circuits.

CO5 : Develop a simple digital system.

LIST OF EXPERIMENTS:

- Verification of Boolean Theorems using basic gates.
- Design and implementation of combinational circuits using basic gates for arbitrary functions, code converters.
- Design and implementation of combinational circuits using MSI devices:
 - 4 – bit binary adder / subtractor
 - Parity generator / checker
 - Magnitude Comparator
 - Application using multiplexers
- Design and implementation of sequential circuits:
 - Shift –registers
 - Synchronous and asynchronous counters
- Coding combinational / sequential circuits using HDL.
- Design and implementation of a simple digital system (Mini Project).

TOTAL: 45 PERIODS

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x		x				x			x
2	x	x										x
3	x	x	x		x				x			x
4	x	x	x	x	x				x			x
5	x	x	x	x	x				x		x	x



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13GE301 – TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS
(Common to all B.E/B. Tech. programmes)

L	T	P	C
3	1	0	4

OBJECTIVES:

- The course aims to impact analytical skills to the students in the areas of boundary value problems and transforms techniques.
- The course objective is to develop the skills of the students in the areas of Transforms and Partial Differential Equations.
- This will be necessary for their effective studies in a large number of engineering subjects like heat conduction, communication systems, electro-optics and electromagnetic theory.
- To introduce Fourier series analysis which is central to many applications in engineering apart from its use in solving boundary value problems?
- To acquaint the student with Fourier transform techniques used in wide variety of situations. To introduce the effective mathematical tools for the solutions of partial differential equations that model several physical processes and to develop Z transform techniques for discrete time systems.

COURSE OUTCOMES:

At the end of the course, the students will be able to

- CO1 : Have gained a well founded knowledge of Fourier series, their different possible forms and the frequently needed practical harmonic analysis that an engineer may have to make from discrete data.
- CO2 : Have obtained capacity to formulate and identify certain boundary value problems encountered in engineering practices, decide on applicability of the Fourier series method of solution, solve them and interpret the results.
- CO3 : Have grasped the concept of expression of a function, under certain conditions, as a double integral leading to identification of transform pair and specialization on Fourier transform pair, their properties.
- CO4 : Be capable of mathematically formulating certain practical problems in terms of partial differential equations, solve them and physically interpret the results..
- CO5 : Have learnt the basics of Z – transform in its applicability to discretely varying functions, gained the skill to formulate certain problems in terms of difference equations and solve them using the Z – transform technique bringing out the elegance of the procedure involved.

UNIT I FOURIER SERIES

(9 + 3)

Dirichlet's conditions – Fourier series – Odd and even functions – Half range sine series – Half range cosine series – Complex form of Fourier series - Parseval's identity – Harmonic Analysis.

UNIT II PARTIAL DIFFERENTIAL EQUATIONS

(9 + 3)

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions – Solution of standard types of first order partial differential equations – Lagrange's linear equation – Linear partial differential equations of second and higher order with constant coefficients.

UNIT III BOUNDARY VALUE PROBLEMS

(9 + 3)

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) – Fourier series solutions in Cartesian coordinates.

UNIT IV FOURIER TRANSFORM**(9 + 3)**

Fourier integral theorem (without proof) – Fourier transform pair – Sine and Cosine transforms – Properties – Transforms of simple functions – Convolution theorem - Parseval's identity- Finite Fourier Transform.

UNIT V Z -TRANSFORM AND DIFFERENCE EQUATIONS**(9 + 3)**

Z transform -Elementary properties – Inverse Z transform (Partial fraction method and Residue method) – Convolution theorem -Formation of difference equations – Solution of difference equations using Z transforms.

TOTAL : 60 PERIODS**TEXT BOOKS:**

1. T Veerarajan., "Engineering mathematics (for III Semester)", 3rd ed., Tata McGraw Hill, New Delhi, 2005.
2. P Kandasamy, K Thilagavathy, and K Gunavathy, "Engineering Mathematics- Volume III", S. Chand & Co Ltd., 2006.

REFERENCES:

1. Goyal. Manish and N P Bali., "A Textbook of Engineering mathematics", 6th ed., Laxmi Publication (P) Ltd. New Delhi, 2012.
2. B S Grewal., "Higher Engineering Mathematics", 42nd ed., Khanna publishers, New Delhi, 2012.
3. Kreyszig. Erwin, "Advanced Engineering Mathematics", 9th ed., Wiley Publications, New Delhi, 2006.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x								x	x
2	x	x		x	x	x		x				x
3	x	x		x			x					x
4	x	x	x	x	x							x
5	x	x	x	x		x						x

13CS301- OPERATING SYSTEMS

L	T	P	C
3	0	0	3

OBJECTIVES:

- To provide a grand tour of the major operating system components.
- To gain knowledge in process, memory and device management.
- To understand security issues related to OS.
- To learn the I/O related information.
- To get the knowledge about the operating system security.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Learn about operating system functioning and processes.

CO2 : Describe the various CPU scheduling algorithms and remove deadlocks.

CO3 : Explain various memory management techniques and concept of thrashing.

CO4 : Recognize file system interface, I/O system and storage.

CO5 : Gain the knowledge about system structures protection and security mechanisms.

UNIT I FUNDAMENTALS

(9)

Introduction, Computer-System Architecture, Operating-System Structure, Operating- System Services and Operations, Distributed Systems, Special-Purpose Systems, Computing Environments, User Operating System Interface, System Calls - Types, System Programs, Operating System Design and Implementation, Operating System Structure, Virtual Machines, Operating System Generation, System Boot.

UNIT II PROCESS MANAGEMENT

(9)

Scheduling: Preemptive and non-preemptive scheduling; scheduling policies; processes and threads; real-time issues; Concurrency: concurrent execution; states and state diagrams; implementation structures; dispatching and context switching; interrupt handling in a concurrent environment; Mutual exclusion: “mutual exclusion” problem; deadlock detection and prevention; solution strategies; models and mechanisms (semaphores, monitors, condition variables); synchronization; multiprocessor issues

UNIT III MEMORY MANAGEMENT

(9)

Review of physical memory and memory management hardware; overlays, swapping, and partitions; paging and segmentation; page replacement policies; working set model and thrashing; caching

UNIT IV SECONDARY STORAGE MANAGEMENT

(9)

Device management: Characteristics of serial and parallel devices; abstracting device differences; buffering strategies; direct memory access; recovery from failures. Disk scheduling and management.

File systems: Fundamental concepts; content and structure of directories; file system techniques; memory-mapped files; special-purpose file systems; naming, searching, and access; backup strategies.

UNIT V SECURITY AND PROTECTION

(9)

Overview of system security; policy/mechanism separation; security methods and devices; protection, access, and authentication; models of protection; memory protection; encryption; recovery management. Case Study: Linux, Windows and Android.

TOTAL: 45 PERIODS

TEXT BOOK:

1. Silberschatz, P.B. Galvin and G. Gagne, “Operating system concepts”, 8th ed., 2011.

REFERENCE:

1. W. Stallings, “Operating systems”, 7th ed., Prentice-Hall, 2011.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1		x										
2							x					x
3		x						x				
4	x											
5												



13CS302- OBJECT ORIENTED PARADIGM AND PROGRAMMING

L	T	P	C
3	0	0	3

OBJECTIVES:

- To understand the principles of object oriented programming.
- To gain familiarity with the syntax, class hierarchy, environment and simple application construction for an object-oriented programming language.
- To learn generic programming concepts in C++.
- To get exposure on re-engineering for real time engineering applications.
- To impart exception handling and streams in building robust applications.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 : Apply principles of object oriented programming concepts in problem solving.

CO2 : Apprehend the syntax and semantics of the C++ programming language.

CO3 : Synthesize generic class templates to be used with different types of data for various applications

CO4 : Design and create new applications by reusing the code.

CO5 : Deploy applications to handle the exceptions and input /output streams during runtime.

UNIT I INTRODUCTION TO FUNDAMENTAL CONCEPTS OF OOP (9)

Survey of programming paradigms – Object-Oriented Paradigm: Elements of Object Oriented Programming – Merits and demerits of object oriented methodology, Benefits of object oriented programming - structure of C++ program– Static members, Working with classes, Classes and Objects-Class specification- class objects- accessing class members- defining member functions - Passing and returning objects – Array of objects - inline functions - accessing member functions within class.

UNIT II OBJECT INITIALIZATION AND CLEANUP (6)

Constructors - Parameterized constructors - Constructor overloading. Copy constructor, Destructors, Default arguments - new, delete operators - “this” pointer, friend classes and friend functions.

UNIT III OVERLOADING AND GENERIC PROGRAMMING (10)

Function overloading – Operator overloading- Non-over loadable operators- unary operator overloading- operator keyword- limitations of increment/decrement operators- binary operator overloading- Generic programming with templates-Function templates- class templates

UNIT IV INHERITANCE (10)

Inheritance-Base class and derived class relationship-derived class declaration-Forms of inheritance-inheritance and member accessibility- constructors in derived class, abstract class, virtual functions, pure virtual function.

UNIT V EXCEPTION HANDLING AND STREAMS (10)

Files and Streams-Opening and Closing a file- file modes- file pointers and their manipulation, sequential access to a file-random access to a file-Reading and Writing files - Exception handling-exception handling model- exception handling constructs- catching exceptions and handling exceptions.

TOTAL: 45 PERIODS

TEXT BOOK:

1. K. R. Venugopal, Rajkumar and T. Ravishankar, “Mastering C++”, 4th ed., Tata McGraw Hill, 2008.

REFERENCES:

1. T Budd, “An Introduction to Object-oriented Programming”, 3rd ed., Addison-Wesley, 2008.
2. Bjarne Stroustrup, “The C++ programming Language”, 3rd ed., Addison Wesley, 2008.
3. M Harvey, Deitel and Paul J. Deitel, “C++ How to Program”, 7th ed., Prentice Hall, 2010.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x	x	x			x		x	x
2	x	x	x	x	x				x		x	x
3	x	x	x	x	x				x		x	x
4	x	x	x	x	x				x		x	x
5	x	x	x	x	x				x		x	x



Approved by Fourth Academic council

13CS303 - DESIGN AND ANALYSIS OF ALGORITHMS

L	T	P	C
3	0	0	3

OBJECTIVES:

- To know the fundamental concepts and techniques for problem solving and algorithm design.
- To learn algorithms correctness using mathematical analysis.
- To be familiar with the important algorithm design techniques.
- To explain different sorting techniques such as heap sort, merge sort, and quick sort.
- To learn the different range of behaviors of algorithms, the notion of tractable and intractable problems.

COURSE OUTCOMES:

At the end of the course, the student will be able to

CO1 : Present fundamental concepts and techniques for algorithm design.

CO2 : Provide necessary background for writing algorithms in a formal way.

CO3 : Prove the correctness and analyze the running time of the basic algorithms for those classic problems in various domains.

CO4 : Apply the algorithms and design techniques to solve problems.

CO5 : Analyze the complexities of various problems in different domain.

UNIT I BASIC CONCEPTS AND MATHEMATICAL ASPECTS OF ALGORITHMS (9)

Introduction – Notion of Algorithm – Fundamentals of Algorithmic Solving – Important Problem types – Asymptotic Notations and Basic Efficiency Classes. Mathematical Analysis of Non-recursive Algorithm – Mathematical Analysis of Recursive Algorithm – Example: Fibonacci Numbers – Empirical Analysis of Algorithms – Algorithm Visualization.

UNIT II BRUTE FORCE AND DECREASE- AND –CONQUER (9)

Brute Force – Selection Sort and Bubble Sort – Sequential Search and Brute-force string matching – Closest pair and convex –hull problems by brute force – Exhaustive search. Decrease and Conquer – Insertion Sort – Decrease-by-a-Constant-Factor Algorithms-Variable-Size-Decrease Algorithms.

UNIT III DIVIDE-AND -CONQUER AND TRANSFORM CONQUER (9)

Divide and conquer – Merge sort – Quick Sort – Binary Search – Binary tree-Traversal and Related Properties. Transform and conquer – Presorting – Gaussian elimination-Heaps and Heap Sort- Horner's Rule and Binary Exponentiation.

UNIT IV DYNAMIC PROGRAMMING AND GREEDY APPROACHES (9)

Dynamic Programming – The Knapsack Problem and Memory Functions - Optimal Binary Search trees -Warshall's and Floyd's Algorithm. Greedy Techniques – Prim's Algorithm – Kruskal's Algorithm – Dijkstra's Algorithm.

UNIT V ITERATIVE IMPROVEMENT AND LIMITATIONS OF ALGORITHM POWER (9)

Iterative Improvement- The Simplex Method - The Maximum-Flow Problem- Maximum Matching in Bipartite Graphs. Limitations of Algorithm Power – Coping with the Limitations of Algorithm Power-Backtracking-Branch and bound – Approximation Algorithms for NP-Hard Problems.

TOTAL: 45 PERIODS

TEXT BOOK:

1. Anany Levitin, "Introduction to the Design and Analysis of Algorithm", 3rd ed., Pearson Education Asia, 2011

REFERENCES:

1. T.H. Cormen, C.E. Leiserson, R.L. Rivest and C. Stein, "Introduction to Algorithms", PHI Pvt. Ltd., 2005.
2. Sara Baase and Allen Van Gelder, "Computer Algorithms - Introduction to Design and Analysis", Pearson Education Asia, 2003
3. A.V. Aho, J. E. Hopcroft, and J. D. Ullman, "Data Structures and Algorithms", Pearson Education, 1988.
4. Horowitz and Sahni , "Fundamentals of Computer Algorithms", Galgothia publications.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x	x		x		x		x	x
2	x	x	x	x	x		x		x		x	x
3	x	x	x	x		x			x		x	x
4	x	x	x	x	x	x		x	x		x	x
5	x	x	x	x				x	x		x	x



13ECC01-MICROPROCESSOR AND INTERFACING
(For CSE & IT Branches)

L	T	P	C
3	0	0	3

OBJECTIVES:

- To introduce fundamentals of 8086 processor.
- To acquire knowledge on assembly language programs
- To know the essentials of 8087.
- To understand basics of peripheral interfacing techniques.
- To be familiar with 80286 & 80386 processors.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Explain the basic architecture of 8086.

CO2 : Write the assembly language programs.

CO3 : Describe the architecture of 8087.

CO4 : Employ the peripheral interfacing.

CO5 : Acquire basic knowledge on 80286 and 80386 processor.

UNIT I 8086 ARCHITECTURE

(9)

Introduction to Microprocessor: Architecture, Minimum and Maximum mode operations of 8086, Addressing modes, Instruction set, interrupts.

UNIT II ASSEMBLY LANGUAGE PROGRAMMING OF 8086

(9)

Assembler Directives, Simple Programs using Assembler, Macro-Procedures, ALP using FOR Loop, WHILE, REPEAT and IF-THEN-ELSE Features- Interrupt Programming- Interrupts-BIOS-DOS-System call-Device management-File management-Interfacing with C.

UNIT III CO-PROCESSOR

(9)

Architecture of 8087-Interfacing with 8086-Data types-Instructions-Programming

UNIT IV PERIPHERALS AND INTERFACING

(9)

Peripherals & Interfacing With 8086: Serial & parallel I/O (8251A and 8255), Programmable interval timer (8253), Programmable DMA controller (8257), programmable interrupt controller (8259A), Keyboard and display controller (8279).

UNIT V 80286 AND 80386, PROCESSOR

(9)

80286 Processor-Features of 80286, internal architecture of 80286, real addressing mode, virtual addressing mode, privilege, protection, Features of 80386Dx, internal architecture of 80386Dx, register organization of 80386Dx.

TOTAL: 45 PERIODS

TEXT BOOK:

1. A.K. Ray and K.M. Bhurchandi ,” Advanced Microprocessors and Peripherals”, 2nd ed., Tata McGraw Hill, 2006.

REFERENCES:

1. K Uday Kumar and B S Umashankar, “ Advanced Micro processors & IBM-PC Assembly Language Programming”, Tata McGraw Hill, 2003
2. Barry B Bray, “The Intel Micro processor 8086/8088, 80186,80286, 80386 and 80486-Architecture, programming and interfacing”, 5th ed., PHI,2005
3. Douglas V. Hall,”Microprocessors and Interfacing Programming and Hardware”. Tata McGraw Hill, 2007.
4. Mohamed Rafiquazzaman, “Microprocessor and Microcomputer based system design”, 2nd ed., Universal Book stall, New Delhi, 1995.
5. Peter Abel, “IBM PC Assembly language & Programming”, 5th ed., PHI,2001

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x	x							x
2	x	x	x	x	x		x					x
3	x	x	x	x	x							x
4	x	x	x	x	x		x					x
5	x	x	x	x	x							x



Approved by Fourth Academic council

13EC305 - ANALOG AND DIGITAL COMMUNICATION

L	T	P	C
3	0	0	3

OBJECTIVES:

- To have understanding about different types of Communication systems
- To have knowledge about different analog modulation techniques
- To gain knowledge about different digital modulation techniques for digital transmission
- To have knowledge about base band data transmission and adaptive equalization techniques
- To know the spread spectrum modulation techniques and different multiple access techniques

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Analyze the Amplitude modulation.

CO2 : Gain knowledge about the Angle modulation.

CO3 : Analyze the techniques of Digital modulation.

CO4 : Get familiarity about the Digital transmission techniques.

CO5 : Have knowledge about the Spread Spectrum and Multiple Access techniques.

UNIT I AMPLITUDE MODULATION

(9)

Principles of amplitude modulation-DSB SC AM, SSB SC AM, VSB AM – AM envelope, frequency spectrum and bandwidth, modulation index and percentage modulation, AM power distribution, AM modulator circuits, AM radio transmitters-Square law, Envelope detector, AM radio receivers – TRF, Superheterodyne receivers.

UNIT II ANGLE MODULATION

(9)

Angle Modulation – FM and PM waveforms, phase deviation and modulation index, frequency deviation, phase and frequency modulators and demodulators, frequency spectrum of a angle modulated waves, Bandwidth requirement, FM transmitter- varactor diode, reactance tube, Armstrong modulator, FM receivers-Foster-seeley discriminator, de-emphasis, ratio detector, PLL FM demodulators.

UNIT III DIGITAL MODULATION TECHNIQUES

(9)

Introduction, Shannon limit for information capacity, amplitude shift keying, frequency shift keying, phase shift keying – binary phase shift keying – QPSK, Quadrature Amplitude modulation, bandwidth efficiency, carrier recovery – squaring loop, Costas loop, DPSK.

UNIT IV DIGITAL TRANSMISSION

(9)

Introduction, Pulse modulation, PCM – PCM sampling, sampling rate, signal to quantization noise rate, companding – analog and digital – percentage error, delta modulation, adaptive delta modulation, differential pulse code modulation, pulse transmission – Intersymbol interference, eye patterns.

UNIT V SPREAD SPECTRUM AND MULTIPLE ACCESS TECHNIQUES

(9)

Introduction, Pseudo-noise sequence, DS spread spectrum with coherent binary PSK, processing gain, FH spread spectrum, multiple access techniques – wireless communication, TDMA and CDMA in wireless communication systems.

TOTAL: 45 PERIODS

TEXT BOOK:

1. T L Singal, “Analog & Digital Communications”, Tata McGraw-Hill Education, 2012.

REFERENCES:

1. H. Taub, D L Schilling and G Saha, “Principles of Communication”, 3rd ed., 2007.
2. Bernard Sklar, “Digital Communication: fundamentals and applications”, Addison Wesley, 2001.
3. Blake, “Electronic Communication Systems”, Thomson Delmar Publications, 2002.
4. Martin S. Roden, “Analog and Digital Communication System”, 3rd ed., PHI, 2002.
5. Wayne Tomasi, “Advanced Electronic Communication Systems”, 6th ed., Pearson Education, 2007.
6. Simon Haykin, “Communication Systems”, 4th ed., John Wiley & Sons, 2001.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1		x	x	x							x	
2		x	x								x	
3		x	x	x								
4			x									
5		x	x								x	



Approved by Fourth Academic council

13CS311 - OPERATING SYSTEMS LABORATORY

L	T	P	C
0	0	2	1

OBJECTIVES:

- To learn how an operating system performs its duties to its innermost levels.
- To prepare students to know the operating system related files.
- To study the process and its scheduling algorithm.
- To learn the basic problems and its solutions of operating systems.
- To understand memory management by its functionality.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Display basic commands and CPU utilization.

CO2 : Explore the knowledge to solve basic scheduling problems.

CO3 : Simulate the operating system processing.

CO4 : Identify components and peripherals of operating systems including input-output devices.

CO5 : Able to create new process for operating systems

LIST OF EXPERIMENTS:

1. Program to report the behavior of the OS to get the CPU type and model, kernel version.
2. Program to get the amount of memory configured into the computer, amount of memory currently available.
3. Implement the various process scheduling mechanisms such as FCFS, SJF, Priority, round – robin.
4. Implement the solution for reader – writer’s problem.
5. Implement the solution for dining philosopher’s problem.
6. Implement Banker’s algorithm.
7. Implement the first fit; best fit and worst fit file allocation strategy.
8. Write a program to create processes and threads.

TOTAL: 45 PERIODS

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x			x							x
2	x	x	x									x
3	x	x	x	x								x
4	x	x	x	x	x		x					x
5	x	x	x	x	x							x



13CS312 OBJECT ORIENTED PROGRAMMING LABORATORY

L	T	P	C
0	0	2	1

OBJECTIVES:

- To understand the principles of object oriented programming.
- To gain familiarity with the syntax, class hierarchy, environment and simple application construction for an object-oriented programming language.
- To learn generic programming concepts in C++.
- To get exposure on re-engineering for real time engineering applications.
- To impart exception handling and streams in building robust application

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO6 : Apply principles of object oriented programming concepts in problem solving.

CO7 : Apprehend the syntax and semantics of the C++ programming language.

CO8 : Synthesize generic class templates to be used with different types of data for various applications

CO9 : Design and create new applications by reusing the code.

CO10 : Deploy applications to handle the exceptions and input /output streams during runtime.

LIST OF EXPERIMENTS

1. Program illustrating function overloading feature.
2. Programs illustrating the overloading of various operators
Ex: Binary operators, Unary operators, New and delete operators etc.
3. Programs illustrating the use of following functions :
 - a) Friend functions
 - b) Inline functions
 - c) Static Member functions
 - d) Functions with default arguments.
4. Programs illustrating the use of destructor and the various types of constructors (no arguments, constructor, constructor with arguments, copy constructor etc).
5. Programs illustrating the various forms of inheritance: Ex. Single, Multiple, multilevel, hierarchical inheritance etc.
6. Write a program having student as an abstract class and create many derived classes such as Engg. Science, Medical, etc. from student's class. Create their objects and process them.
7. Write a program illustrating the use of virtual functions.
8. Write a program which illustrates the use of virtual base class.
9. Write programs to illustrating file handling operations:
Ex. a) Copying a text files b) Displaying the contents of the file etc.
10. Write programs illustrating how exceptions are handled (ex: division-by-zero, overflow and underflow in stack etc)

TOTAL: 45 PERIODS

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x	x				x		x	x
2	x	x	x	x	x				x		x	x
3	x	x	x	x	x				x		x	x
4	x	x	x	x	x				x		x	x
5	x	x	x	x	x				x		x	x



13ECC11 MICROPROCESSOR AND INTERFACING LABORATORY
(For CSE & IT Branches)

L	T	P	C
0	0	3	2

OBJECTIVES:

- Perform the Arithmetic operations in 80x86.
- Implement the program for Interfacing.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Utilize the 8086 microprocessor kit.

CO2 : Write simple assembly language programs.

CO3 : Apply the ALP concepts on real time applications.

CO4 : Correlate mathematical knowledge to engineering problems.

CO5 : Work with microprocessor interfaces.

LIST OF EXPERIMENTS

1. Study Experiments
 - i) Study of 8086 Architecture ii) Study of 8255 – PPI
 - iii) Study of 8253 – PIT iv) Study of 8279 – PKI v) Study of 8259 – PIC
2. Write an ALP to find out factorial of a given hexadecimal number using 8086 MP
Data: 0AH, 0FH, 10H
3. Write an ALP to perform 16 bit arithmetic operations (ADD, SUB, MUL, and DIV)
4. Write an ALP to generate the sum of first ‘N’ natural numbers using 8086 MP
5. Write an ALP to convert given hexadecimal number to binary using 8086 MP Data: ABH, CDH, 101H
6. Write an ALP to convert given binary number to hexadecimal number using 8086MP
Data: 101010102, 111111112, 11002, 11112
7. Write an ALP to order give set of hexadecimal numbers in ascending and descending order
Data: 0AH, 0FH, 0DH, 10H, 02H
8. Write an ALP to move block of data from locations 1200H-1205H to 2200H – 2205H
9. Write an ALP to reverse the given string
Data: WELCOME
10. Write an ALP to generate the following series $1+1/x+1/x^3+1/x^5+ \dots$
11. Write an ALP to generate square wave using 8255 PPI
12. Write an ALP to generate rate generator using 8253 PIT
13. Write an ALP to interface keyboard with 8086 using 8279 PKI
14. Write an ALP to display the given message using 8279 PKI Message: COMPUTER SCIENCES
15. Write an ALP to interface analog to digital converter.

TOTAL: 45 PERIODS

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x	x							x
2	x	x	x	x	x							x
3	x	x	x	x	x							x
4	x	x	x	x	x							x
5	x	x	x	x	x							x



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13PT311- LANGUAGE COMPETENCY DEVELOPMENT – 1
(Common to All B.E/B.Tech Programmes)

L T P C
0 0 2 0

OBJECTIVES:

- To make students speak English fluently with emphasis on:
 - Articulation
 - Vocabulary
 - Content
- To develop the habit of self research for learning among students.
- To develop behavioral skills among students across all levels.
- To develop reading habits.
- To develop persuasion and negotiation skills.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Articulate fluently in English on the day to day affairs.

CO2 : Know the areas from where they can research and learn English.

CO3 : Exhibit professionalism.

CO4 : Exhibit expertise on world affairs.

CO5 : Exhibit persuasion skills.

UNIT I : AUXILIARIES

(7)

am, is, are (statement and questions) - I am doing - are you doing? - I do/work/like - I don't - Do you - I am doing and I do - I have / I've got

UNIT II : TENSE

(10)

was/were - worked/got/went - I didn't...dit you...? - I was doing - I was doing and I did - I have done - I've just...I've already...I haven't...yet - Have you ever...? - How long have you...? - for since ago - I have done and I did - is done was done - is being done has been done - be/have/do

UNIT III : MODALS

(7)

Regular and irregular verbs - I used to... - What are you doing tomorrow? - I'm going to... - will/shall - will/shall - might - can and could - must – should

TOTAL: 24 PERIODS

TEXT BOOK

1. English Spoken Course materials from the Speak Easy academy.

REFERENCE BOOK

1. Wren, Martin, “High School English Grammar and Composition”.

Continuous Assessment Rubrics:

Sl. No.	Evaluation Activities	Mark Allotment	Metrics	
1	News Presentation	15	Articulation (a)	Average (a+b+c+d+e)
2	Debate	20	Word Usage (b)	
3	Class Participation	15	Content (c)	
			Listening (d)	
			Body Language (e)	
Internal Total		50		

Final Assessment Rubrics:

Sl. No.	Evaluation Activities	Mark Allotment	Metrics	
1	Assessment Centre	20	Role delivery (a) Articulation & Word Usage (b) Content Validity (c) Participation in team (d)	Average (a+b+c+d)
2	Written Test	30	Objective type	
Final Total		50		

Notes:

- News presentation and debate shall happen in every class. So the final marks will be the average of all the attempts.
 - News presentation and debate will be unconventional where in it will be within the team and not for the whole class at once.
 - On a given hour a faculty can assess two teams so considering that there will 72 students there will 6 teams of 12 each and hence every students would have done presentation and debate at least twice per semester for assessment alone.
- Class participation is based on the student's regularity in doing home work.
- Assessment Centre is one where a case shall be given and the students shall be given roles to perform. Language skills, Behavioral skills, General Awareness, Persuasion Skills shall be measured during this exercise.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1									x	x		x
2									x	x		x
3									x	x		
4									x	x		x
5									x	x		x



13GE403 - PROBABILITY AND QUEUEING THEORY
(Common to CSE & IT programmes)

L	T	P	C
3	1	0	4

OBJECTIVES:

- Acquire knowledge of the random variable and manipulate some standard distributions.
- Queuing theory provides models for a number of situations that arise in real life.
- To understand and conduct computer systems modeling and performance analysis.
- To introduce the basic probability tools and concepts this is useful in modeling, such as Markov models and queuing theory.
- To provide necessary mathematical support and confidence to tackle real life problems.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Have a fundamental knowledge of the basic probability concepts.

CO2 : Have a well-founded knowledge of standard distributions which can describe the real life phenomena.

CO3 : Use discrete time Markov chains to model computer systems

CO4 : Be exposed to basic characteristic features of a queuing system and acquire skills in analysing queuing models.

CO5 : Provide necessary mathematical support and confidence to tackle real life problems.

UNIT I PROBABILITY AND RANDOM VARIABLE

(9 + 3)

Axioms of probability – Conditional probability – Total probability – Baye's theorem - Random variable-Probability mass function – Probability density function – Properties - Moments –Moment generating functions and their properties. Joint distributions-Marginal and conditional distributions-Covariance-Correlation and Regression-Transformation of random variables-Central limit theorem.(Excluding proof)

UNIT II STANDARD DISTRIBUTIONS

(9 + 3)

Discrete distributions: Binomial, Poisson and Geometric- Continuous distribution: Uniform, Exponential - Weibull and normal distributions and their properties- Functions of a Random Variable.

UNIT III RANDOM PROCESS AND MARKOV CHAIN

(9 + 3)

Classification-Stationary process-Poisson process-Markov Chain-Transition probabilities-Limiting Distributions

UNIT IV QUEUEING THEORY

(9 + 3)

Markovian models-(M/M/1), (M/M/C), finite and infinite capacity-(M/G/1) queue-Pollaczek-Khintchine Formula.

UNIT V PARTIAL AND MULTIPLE CORRELATIONS

(9 + 3)

Partial correlation – zero order, first order and second order coefficients-multiple correlation-multiple regression analysis.

TOTAL: 60 PERIODS

TEXT BOOKS:

1. Gross, Donald Harris and M Carl, “ Fundamentals of Queuing Theory”, 3rd ed., Wiley Publications, New Delhi, 1998.
2. T Veerarajan., “Probability, Statistics and Random Processes”, 2nd ed., Tata McGraw-Hill, New Delhi, 2008.

REFERENCES:

1. Allen and O. Arnold, "Probability, Statistics and Queuing Theory with Computer Applications", 2nd ed., Elsevier, New Delhi, 1990.
2. H.A Taha., "Operations Research - An Introduction", 8th ed., Pearson Education, New Delhi, 2008.
3. S K Trivedi., "Probability and Statistics with Reliability, Queuing and Computer Science applications", 2nd ed., John Wiley & Sons, New Delhi, 2002.
4. S.C.Gupta and V.K.Kapoor, "Fundamentals of Mathematical Statistics", 10th ed., Sultan chand & Sons, New Delhi, 2000.
5. Ibe, C. Oliver, "Fundamentals of Applied Probability and Random Processes", Elsevier, New Delhi, 2005.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x		x			x				x	x
2	x	x		x							x	x
3	x	x		x	x		x	x			x	x
4	x			x	x		x				x	x
5	x	x			x			x			x	x



13CS401 - DATABASE SYSTEMS

L	T	P	C
3	0	0	3

OBJECTIVES:

- To train the fundamental concepts of database management system, database modeling and design, SQL, PL/SQL, system implementation techniques.
- To enable students to model ER diagram for any customized applications.
- To provide knowledge on distributed databases, concurrency techniques, federated systems and active databases.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Know the fundamentals of data base system.

CO2 : Learn about ER model, Relational database architecture and querying through SQL.

CO3 : Know about normalization.

CO4 : Gain knowledge about transaction processing, concurrency control and recovery.

CO5 : Understand the storage structures and the queries processing/optimization.

UNIT I DATABASE SYSTEMS

(9)

History and motivation for database systems – characteristics of database approach - components of database systems; database architecture and data independence.

UNIT II DATA MODELING

(9)

ER Model – Relational Model – Mapping ER model to a relational schema – entity and referential integrity - Database query languages: Overview of database languages; Relational Algebra –SQL

UNIT III RELATIONAL DATABASE DESIGN

(9)

Guidelines for Relational Schema - functional dependency; normal forms; multi-valued dependency; join dependency

UNIT IV QUERY PROCESSING AND TRANSACTION PROCESSING

(9)

SQL queries into Relational Algebra – heuristic query optimization – Introduction to Transaction Processing – Transaction and System concepts - Desirable properties of Transactions - Concurrency Control: concepts and Two-Phase Locking

UNIT V PHYSICAL DATABASE DESIGN

(9)

Storage and file structure: indexed files; hashed files; signature files; b+-trees; files with dense index; files with variable length records.

TOTAL: 45 PERIODS

TEXT BOOK:

1. R. Elmasri and S. B. Navathe, “Fundamentals of Database Systems”, 6th ed., Addison Wesley, 2011.

REFERENCES:

1. H Silberschatz, F. Korth and S. Sudershan, “Database System Concepts”, 6th ed., McGraw Hill, 2010.
2. C. J. Date, “An Introduction to Database Systems”, 8th ed., Addison Wesley, 2003.
3. H. Garcia et al., “Database System Implementation”, Prentice Hall, 2000.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x	x	x					x	x
2	x	x	x	x	x	x	x		x		x	x
3	x	x	x	x	x				x			x
4	x	x	x	x	x				x			x
5	x	x	x	x	x				x		x	x



13CS402 - JAVA PROGRAMMING

L	T	P	C
3	0	0	3

OBJECTIVES:

- To impart the fundamental concepts of core JAVA.
- To gain exposure about packages and collections Interfaces.
- To learn about exception handling and multithreading concepts
- To get knowledge about building Event handling applications using AWT and SWING.
- To build applications using Networking and JDBC concepts.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Know how to solve basic design problems using object oriented concepts.

CO2 : Develop applications in JAVA using packages and Collection Interfaces.

CO3 : Implement the robust and multitasking applications using exception handling and multithreading concepts

CO4 : Develop the simple GUI interfaces to interact with users and real time applications.

CO5 : Deploy the real time engineering applications using networking and JDBC concepts.

UNIT I INTRODUCTION

(9)

Features of Java – Data types – Operators –Arrays –Control Statements – Classes – Methods – Objects – Constructors – Garbage Collection –Inheritance – Using Super – Method Overriding – Abstract Classes – Using final with inheritance – String Handling – String class – String buffer class.

UNIT II PACKAGES &INPUT / OUTPUT OPERATIONS

(9)

Packages – Interfaces – Exploring java.util Package – Collection Interfaces – Collection Classes – Exploring java.io Package – File – Byte Streams – Character Streams. Exploring Java.lang package – Simple type wrappers – Runtime – System – Object – Class – Math thread – Using clone() and the Cloneable Interface.

UNIT III EXCEPTION HANDLING AND THREADS

(9)

EXCEPTION HANDLING: Fundamentals – Compile time errors –Run time errors – Exception types – try catch block – Multiple catch statement – Nested try – Throw – Finally – User defined exceptions.

THREADS: Java threads – Priorities – Synchronization – Thread class and Runnable interfaces – Creating threads – Multiple threads – Inter thread communication.

UNIT IV APPLETS & SWING

(9)

Applet Basics – AWT classes – Frames – Graphics – AWT controls – Layout managers – Swing – Model-View-Controller Design Pattern – Swing Components – Programming examples.

UNIT – V NETWORKING & JAVA DATABASE CONNECTIVITY

(9)

JAVA NETWORKING: Basics – Socket overview – TCP/IP client sockets – TCP/IP server sockets –URL – Datagram sockets. JDBC: Manipulating Database with JDBC- Connecting to and querying the database – RowSet Interface – Prepared Statements and Stored Procedures – Transaction Processing.

TOTAL:45 PERIODS

TEXT BOOK:

1. Patrick Naughton and Herbert Schildt, “Java 2- The Complete Reference”, 8th ed., Tata McGraw Hill, New Delhi, 2008.

REFERENCES:

1. H.M. Deitel and P.J. Deitel, "JAVA™ How to program", 9th ed., Pearson Education, 2009.
2. Advanced programming in JAVA prentice – Hall of India Private Limited NIIT – 2003.
3. George Reese, "Database Programming with JDBC & Java", 2nd ed., O'Reilly Media, 2000.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and Pos												
COs	Pos											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x	x							x
2	x	x	x	x	x							x
3	x	x	x	x	x							
4	x	x	x	x	x							x
5	x	x	x	x	x							x



13ITC01 - COMPUTER ARCHITECTURE AND ORGANIZATION

L	T	P	C
3	0	0	3

OBJECTIVES:

- To learn the fundamentals of Architecture.
- To gain knowledge about computer data representation and manipulation.
- To understand the basic organization for data storage and access across various media.
- To provide knowledge of interfacing techniques.
- To study the concepts of subsystem devices.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Identify the needs of functional units of the processor.

CO2 : Solve basic binary math operation.

CO3 : Perceive knowledge about internal and external memory technologies.

CO4 : Know the purpose of interfacing.

CO5 : Acquire knowledge on storage systems.

UNIT I FUNDAMENTALS OF COMPUTER ARCHITECTURE (9)

Organization of the von Neumann machine; Instruction formats; The fetch/execute cycle, instruction decoding and execution; Registers and register files; Instruction types and addressing modes; Subroutine call and return mechanisms; Programming in assembly language; I/O techniques and interrupts; Other design issues.

UNIT II COMPUTER ARITHMETIC (9)

Data Representation, Hardware and software implementation of arithmetic unit for common arithmetic operations: addition, subtraction, multiplication, division(Fixed point and floating point); Conversion between integer and real numbers; Representation of non-numeric data (character codes, graphical data).

UNIT III MEMORY SYSTEM ORGANIZATION AND ARCHITECTURE (9)

Memory systems hierarchy; Coding, data compression, and data integrity; Electronic, magnetic and optical technologies; Main memory organization, Types of Main memories, and its characteristics and performance; Latency, cycle time, bandwidth, and interleaving; Cache memories (address mapping, line size, replacement and write-back policies); Virtual memory systems; Reliability of memory systems; error detecting and error correcting systems.

UNIT IV INTERFACING AND COMMUNICATION (9)

I/O fundamentals: handshaking, buffering; I/O techniques: programmed I/O, interrupt- driven I/O, DMA; Interrupt structures: vectored and prioritized, interrupt overhead, interrupts and reentrant code; Buses: bus protocols, local and geographic arbitration.

UNIT V DEVICE SUBSYSTEMS (9)

External storage systems; organization and structure of disk drives and optical memory; Basic I/O controllers such as a keyboard and a mouse; RAID architectures; I/O Performance; Processor to network interfaces.

TOTAL : 45 PERIODS

TEXT BOOK:

1. L John ,Hennessy and David A. Patterson, “Quantitative Approach – Computer Architecture”, 5th ed., Morgan Kaufmann Publishers, 2011.

Approved by Fourth Academic council

REFERENCES:

1. W. Stallings, "Computer Organization and Architecture", 8th ed., Prentice-Hall, 2009.
2. M. M. Mano, "Computer System Architecture", 3rd ed., Prentice-Hall, 1992
3. J. P. Hayes, "Computer system architecture", 3rd ed., McGraw Hill, 2002.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x		x	x					x			x
2	x	x	x						x			x
3	x		x	x					x			x
4	x		x	x					x			x
5						x						x



13CS403 - SOFTWARE ENGINEERING

L	T	P	C
3	0	0	3

OBJECTIVES:

- To introduce the fundamental concepts of process, product and project.
- To make familiar with the principles of requirement engineering.
- To develop appropriate design solutions for the given problem.
- To introduce the different testing strategies and test plan.
- To know about standards of quality assurance and management.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Perceive fundamental concepts of software engineering, s/w life cycle and process models.

CO2 : Outline various requirement engineering process

CO3 : Acquire knowledge about design principles.

CO4 : Develop a software test plan.

CO5 : Summarize software quality assurance and management.

UNIT I FUNDAMENTALS OF SOFTWARE ENGINEERING (7)

Software Engineering Fundamentals; Software processes: Software life-cycle and process models; Agile Methodology, Prototyping; Process assessment models-System Engineering. Introduction to Software Project Management

UNIT II REQUIREMENTS ENGINEERING (11)

Software requirements and specifications: Requirements elicitation techniques- Challenge of requirement elicitation; Functional and nonfunctional requirements; User requirements, System requirements, Requirements analysis modeling techniques- System Models; Requirement validation and software requirement specification document. - Basic concepts of formal specification techniques.

UNIT III SOFTWARE DESIGN (11)

Fundamental design concepts and principles; Design characteristics; Modularity; Architectural design - System structuring, Control models; Structured design; Object- oriented analysis and design; Introduction to User interface design.

UNIT IV SOFTWARE VALIDATION AND MAINTENANCE (9)

Testing fundamentals, Verification and Validation, Black-box and white-box testing techniques; Test plan; test case generation; Inspections. Software evolution: Software maintenance- Characteristics of maintainable software; Introduction to Reengineering, Legacy systems and Software configuration management.

UNIT V SOFTWARE QUALITY AND PROCESS IMPROVEMENT (7)

Software quality assurance; software Quality management; Process Improvement; Overview of SEI-CMM, ISO 9000, CMMI, PCMM, TQM and Six Sigma;

TOTAL: 45 PERIODS

TEXT BOOK:

1. Ian Sommerville, "Software Engineering", 9th ed., Addison-Wesley, 2010.

REFERENCES:

1. R. S. Pressman, "Software Engineering, a practitioner's approach", 7th ed., McGraw Hill, 2010
2. Watts Humphrey, "Managing the Software Process", 1989.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x	x	x	x		x		x	x
2	x	x	x	x		x	x		x	x	x	x
3	x	x	x	x	x		x	x	x	x	x	x
4	x	x	x	x	x		x	x	x		x	x
5	x		x			x	x	x	x	x	x	x



13CS404 - COMPUTER NETWORKS

L	T	P	C
3	0	0	3

OBJECTIVES:

- To study the foundational principles, architectures, and techniques employed in computer networks.
- To study the concepts of communication networks, protocols and their performance
- To learn different types of network.
- To understand the layer of networks and its device.
- To study the networks management principles with its issues.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Distinguish circuit switching and packet switching.

CO2 : Explain the basic network architecture.

CO3 : Perceive knowledge on basic LAN technologies.

CO4 : Describe the purpose of routing.

CO5 : Infer the network management issues.

UNIT I INTRODUCTION TO COMPUTER NETWORKS (9)

Networking principles; switching - circuit switching, packet switching, frame relay, cell switching, multiple access.

UNIT II COMMUNICATIONS NETWORK PROTOCOLS (9)

Network protocol (syntax, semantics, and timing); Protocol suites (OSI and TCP/IP); Layered protocol software(stacks): Physical layer networking concepts; data link layer concepts; network layer concepts; transport and application layer concepts; Network Standards and standardization bodies.

UNIT III LOCAL AND WIDE AREA NETWORKS (9)

LAN topologies (bus, ring, star), LAN technologies (Ethernet, token Ring, Gigabit Ethernet), Error detection and correction, Carrier sense multiple access networks (CSMA), Large networks and wide areas, Protocols (addressing, congestion control, virtual circuits, quality of service). Internet - addressing, routing, end point control; Internet protocols - IP, TCP, UDP, ICMP, HTTP, CIDR.

UNIT IV ROUTING AND CONGESTION CONTROL ALGORITHMS (9)

Flooding; Minimal spanning trees; Bellman Ford, Dijkstra's, OSPF, BGP shortest path algorithms; The leaky bucket, Floyd Warshall and Random Early Detection congestion methods; Data security and integrity: Fundamentals of secure networks; cryptography; Encryption and privacy: Public key, private key, symmetric key; Authentication protocols; Packet filtering; Firewalls; Virtual private networks; Transport layer security.

UNIT V NETWORK MANAGEMENT AND PERFORMANCE ANALYSIS OF NETWORKS (9)

Overview of the issues of network management; Domain names and name services; Issues for Internet Service Providers (ISPs); Quality of service issues: performance, failure recovery.

TOTAL: 45 PERIODS

TEXT BOOK:

1. W. Stallings, "Data & Computer Communications", 9th ed., Prentice-Hall, 2010.

REFERENCES:

1. S. Tanenbaum, "Computer networks", 5th ed., Prentice-Hall, 2010.
2. Behrouz A Forouzan, "Data Communications and Networking", Tata Mc- grawhill, 2007.
3. J. Walrand and P. Varaiya, "High Performance Communication Networks", Harcourt Asia, 2000.
4. J.F. Kurose and K.W. Ross, "Computer Networking: A Top-Down Approach Featuring the Internet", 3rd ed., Pearson Education, 2004.
5. D. E. Comer and D.L. Stevens, "Internetworking with TCP/IP", 5th ed., Prentice-Hall, 2005.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x											x
2		x										
3								x				
4	x		x									x
5									x			x



13CS411 - DATABASE SYSTEMS LABORATORY

L	T	P	C
0	0	2	1

OBJECTIVES:

- To design a database system.
- To study the usage of DDL and DML commands
- To learn about joins, views, various built in functions.
- To work with database connectivity
- Improving knowledge of querying techniques

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Understand, appreciate and effectively explain the underlying concepts of database technologies.

CO2 : Declare and enforce integrity constraints on a database using a state-of-the-art RDBMS

CO3 : Populate and query a database using SQL DML/DDI commands.

CO4 : Create various views and make use of various types of joins.

CO5 : Programming PL/SQL including stored procedures, stored functions, cursors, packages.

LIST OF EXPERIMENTS

1. a) Create a table EMP with the following fields.
ENAME
ENO.
SALARY DEPTNO ADDRESS DNAME
b) Insert 5 records into EMP
c) ALTER EMP table i) varying size of ENO field ii) adding a new field JOB
d) Delete the table EMP
2. Create a table EMP with the above mentioned fields.
i) Insert 5 records into EMP
ii) Update the salary of the Employees by 10% hike
iii) Delete the employees whose name is 'AAA'
3. Create a table ORDER with the following fields and constraints. ORDER

Column Name	Constraint Name	Constraint Type
Order-no	pk-order-no	PRIMARY KEY
Item-name itm	UNIQUE Qty	ck-aty CHECK (25<QTY<50)
rate-unit	Nn-rate	NOT NULL
4. Using Ex 3.
 1. Drop unique constraint for item-name
 2. Disable the constraint Nn-rate
 3. Insert a record with NULL values for rate unit
 4. Enable the constraint with NULL value existing on rate-unit
 5. Create a table EMP mentioned above and test all the arithmetic functions and character functions
 6. Add a field date-of-birth to EMP table and test all the date functions.
 7. i) Modify EMP table adding a new field BONUS, update it using NVL
ii) Retrieve the employees whose name starts with S.
iii) Select all the employees who are working in IT department.
 8. i) Using EMP table find the employee getting maximum salary
ii) Find the employee whose salary is minimum
iii) Find the sum of salaries of all the employees working in 'ACCOUNTS' department.

9. Create a table DEPT with the following fields
DNo. Primary Key DName
Modify EMP table adding a foreign key constraint on DeptNo.
i) Insert 6 records into Dept.
ii) Implement the following Join operations
a) Self Join
b) Equi Join
c) Non Equi Join
d) Outer Join
e) Natural Join
10. Using EMP and DEPT, implement all type of view techniques.
a) Row subset view
b) Column subset view
c) Row column subset view d) Grouped view
e) Joined view
f) With check option
11. Using EMP and DEPT
a) Create a sequence to insert the empno in EMP table
b) Create a synonym for the above two tables

TOTAL: 45 PERIODS

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x		x								x	x
2	x	x	x	x							x	x
3	x	x	x	x	x				x			x
4	x	x		x	x							x
5	x	x	x	x	x		x	x	x		x	



13CS412 - JAVA PROGRAMMING LABORATORY

L	T	P	C
0	0	2	1

OBJECTIVES:

- To impart the fundamental concepts of core JAVA.
- To gain exposure about packages and collections Interfaces.
- To learn about exception handling and multithreading concepts
- To get knowledge about building Event handling applications using AWT and SWING.
- To build applications using Networking and JDBC concepts.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Know how to solve basic design problems using object oriented concepts.

CO2 : Write JAVA applications using packages and Collection Interfaces to build real time applications.

CO3 : Implement the robust and multitasking applications using exception handling and multithreading concepts

CO4 : Develop the simple GUI interfaces to interact with users and real time applications.

CO5 : Deploy the real time engineering applications using networking and JDBC concepts.

LIST OF EXPERIMENTS:

1. Programs illustrating overloading and overriding methods in JAVA.
2. Programs illustrating the implementation of various forms of inheritance
3. (For Single, Hierarchical, Multilevel inheritance,).
4. Programs using interfaces in JAVA.
5. Programs to create packages in JAVA.
6. Develop a Java package with simple Stack and Queue classes. Use JavaDoc comments for documentation.
7. Programs to create multiple threads in JAVA.
8. Design a thread-safe implementation of Queue class. Write a multi-threaded producer-consumer application that uses this Queue class.
9. Programs which illustrates the use of files and streams.
10. Programs to write applets to draw the various shapes.
11. Create and manipulate labels, lists, Text fields, Text areas and panels.
12. Write a java program for scientific calculator.
13. Implementation of JDBC.
14. Design Chat Application.

TOTAL: 45 PERIODS

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x	x							x
2	x	x	x	x	x							x
3	x	x	x	x	x							
4	x	x	x	x	x							x
5	x	x	x	x	x							x

Shanhu

13CS413 - COMPUTER NETWORKS LABORATORY

L	T	P	C
0	0	3	2

OBJECTIVES:

- Become familiar with the basics of computer networks
- To make students to get familiarized with different protocols and network components
- To understand the fundamental services provided by various protocols.
- To learn the current technology in network software.
- To derive new protocol design by the simulation software.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Recognize the packet system and protocol layers of a network stack

CO2 : Recognize the features of client/server systems and programs.

CO3 : Able to implement simple systems using simulation model.

CO4 : Understand the protocols by the protocol analyzer tool.

CO5 : Implementation of the protocol with its purpose.

LIST OF EXPERIMENTS

2. Write a program to display the server's date and time details at the client end.
3. Write a program to display the client's address at the server end.
4. Write a program to implement an echo UDP server.
5. Write a program to develop a simple Chat TCP and UDP application.
6. Write a program to capture each packet and to examine its checksum field.
7. Network layer concepts; to be done with only computer
 - a. Configuration of IP addresses
 - b. Configuration of Subnet mask
 - c. Configuration of Gateway
 - d. Setting up LAN
 - e. Connecting two or more different LAN with different subnet mask
 - f. Making computer to work like router/gateway with the help of IP address
8. Protocol analyzer using ethereal
 - a. Capturing and analyzing Ethernet frames
 - b. HTTP GET/response interaction
 - c. Analysis of ICMP and Ping
 - d. Analysis of ICMP and Trace route
 - e. Capturing a bulk TCP transfer from your computer to a remote server
9. Additional activities (Optional)
 - a. Compute checksum fields using CRC-12 and examine the same during the frame transmission.
 - b. Implementation of sliding window protocol as part of DLC.
 - c. IPv4 and IPv6 protocol testing and implementation.
 - d. TCP and UDP protocol testing and implementation.
 - e. SNMP implementation
 - g. RSA public key and private key encryption and decryption
 - h. Data compression using Huffman codes.

TOTAL: 45 PERIODS

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x											x
2			x	x		x						x
3			x									
4		x										
5	x	x		x								



13PT411 - LANGUAGE COMPETENCY DEVELOPMENT – 2
(Common to All B.E/B.Tech Programmes)

L	T	P	C
0	0	2	0

OBJECTIVES:

- To make students speak English fluently with emphasis on:
 - Articulation
 - Vocabulary
 - Content
- To develop the habit of self research for learning among students.
- To develop behavioral skills among students across all levels.
- To develop reading habits.
- To develop persuasion and negotiation skills.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Articulate fluently in English on the day to day affairs.

CO2 : Know the areas from where they can research and learn English.

CO3 : Exhibit professionalism.

CO4 : Exhibit expertise on world affairs.

CO5 : Exhibit persuasion skills.

UNIT I : QUESTIONS PATTERNS AND TAGS

(10)

I have to... - Would you like ...? I'd like... - there is there are - there was/were there has/have been there will be - It... - I am I don't etc - Have you? Are you? Don't you? Etc. - too/either so am I / neither do I etc. - isn't haven't don't etc. - Is it? Have you...? Do they...? Etc. - Who saw you? Who did you see? - Who is she talking to? What is it like? - What...? Which...? How...? - How long does it take...? - Do you know where...? I don't know what...etc.

UNIT II : REPORTED SPEECH - SAID, TOLD, WANT SERIES

(10)

She said that... He told me that... Work/working go/going do/doing - to...(I want to do) and ing (I enjoy doing) - I want you to... I told you to... - I went to the shop to... go to... go on... go for... going - get - do and make - have.

UNIT III : SELF DESCRIPTIONS

(4)

I/me he/him they/them etc. - My/his/their etc. - Whose is this? It's mine/yours/hers etc. - I/me/my/mine.

TOTAL: 24 PERIODS

TEXT BOOK

1. English Spoken Course materials from the Speak Easy academy.

REFERENCE BOOK

1. Wren, Martin, "High School English Grammar and Composition", 1st ed., S. Chand & Company Ltd 2011.
2. Dr. B. B. Jain, "UPKAR's Correct English – How to Write it", Upkar Prakashan Publishers, 2005.

Continuous Assessment Rubrics:

Sl. No.	Evaluation Activities	Mark Allotment	Metrics	
1	News Presentation	15	Articulation (a)	Average (a+b+c+d+e)
2	Debate	20	Word Usage (b)	
3	Class Participation	15	Content (c)	
			Listening (d)	
			Body Language (e)	
Internal Total		50		

Final Assessment Rubrics:

Sl. No.	Evaluation Activities	Mark Allotment	Metrics	
1	Assessment Centre	20	Role delivery (a) Articulation & Word Usage (b) Content Validity (c) Participation in team (d)	Average (a+b+c+d)
2	Written Test	30	Objective type	
Final Total		50		

Notes:

- News presentation and debate shall happen in every class. So the final marks will be the average of all the attempts.
 - News presentation and debate will be unconventional where in it will be within the team and not for the whole class at once.
 - On a given hour a faculty can assess two teams so considering that there will 72 students there will 6 teams of 12 each and hence every students would have done presentation and debate at least twice per semester for assessment alone.
- Class participation is based on the student's regularity in doing home work.
- Assessment Centre is one where a case shall be given and the students shall be given roles to perform. Language skills, Behavioral skills, General Awareness, Persuasion Skills shall be measured during this exercise

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1							x					x
2									x		x	
3				x								
4	x				x	x	x					
5			x				x		x			



Approved by Fourth Academic council

SEMESTER V

13GE501 DISCRETE MATHEMATICS

L	T	P	C
3	1	0	4

OBJECTIVES:

- To understand the basic concepts of logic and their applications.
- Be exposed to concepts and properties of set theory and functions.
- Be aware of the counting principle.
- To understand the concepts of the basic graph theory.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : To understand the basic concepts of logic and their applications.

CO2 : Be aware of counting principle.

CO3 : Exposed to concepts and properties of set theory and functions.

CO4 : Apply graph theory models of data structures and state machines to solve problems of connectivity and constraint satisfaction, for example, scheduling.

CO5 : Acquire knowledge of Elementary combinatorial processes such as permutations and combinations.

UNIT I: PROPOSITIONAL CALCULUS

(9+3)

Propositions-Logical connectives-Compound propositions-Conditional and biconditional propositions-Truth tables-Tautologies and Contradictions-Logical and Equivalences and implications- De Morgan's Laws-Normal forms-Rules of inference-Arguments-Validity of arguments.

UNIT II: PREDICATE CALCULUS

(9+3)

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.

UNIT III: SET THEORY AND FUNCTIONS

(9+3)

Set Operations-Properties-Power set-Relations-Graph and matrix of a relation-Partial Ordering-Equivalence relation-Partitions-Functions-Types of functions-Composition of relation and functions-inverse functions.

UNIT IV: COMBINATORICS

(9+3)

Basics of counting-Counting arguments-Pigeonhole Principle-Permutations and Combinations-Recursion and recurrence relations - Generating Functions - Mathematical Induction-Inclusion-Exclusion.

UNIT V: GRAPH THEORY

(9 + 3)

Introduction to graphs - Graph operations-Graph and Matrices - Graph Isomorphism-Connected graphs-Euler Graphs-Hamilton paths and circuits-Shortest path problem.

TOTAL: 60 PERIODS

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. Kenneth H.Rosen, Discrete Mathematics and its Applications, Fifth Edition, Tata McGraw- Hill Publications, New Delhi 2007.
2. Venkatraman M.K., "Discrete Mathematics" ,The National Publishing Company, Chennai,2007.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x			x						x	x
2	x	x	x	x	x						x	x
3	x	x	x			x	x				x	x
4	x		x	x	x						x	x
5	x	x	x	x	x	x					x	x



13CS501 INTERNET AND WEB PROGRAMMING

L	T	P	C
3	0	0	3

OBJECTIVES:

- To understand the basic concepts of web programming and internet
- To understand how the client-server model of Internet programming works.
- To develop interactive, client-side, executable web applications.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Understand the basic concepts of web programming and internet

CO2 : Create web pages using XHTML and CSS

CO3 : Develop interactive, client-side, executable web applications

CO4 : Differentiate how Servlets and Java Server Pages (JSP) fit into Java-based web application architecture

CO5 : Design and launch XML Web services

UNIT I: INTRODUCTION

(8)

Web Essentials: Basic Internet Protocol - WWW – HTTP Request Message - HTTP Response Message – Web Clients - Web Servers – Web Browsers -Vulnerability-Web Security– URL - Domain Name.

UNIT II: XHTML AND CSS

(10)

HTML Introduction – Basic XHTML syntax and Semantics - HTML Elements & Attributes - Lists – Tables– Frames – Forms- Defining XHTML's Abstract Syntax-Creating HTML Documents; CSS - Features – Syntax – Cascading and Inheritance - Text Properties - Box Model - Flow–Other style Properties.

UNIT III: JAVASCRIPT

(9)

JavaScript introduction - Basic Syntax - Variable - Data Types - Operators and Literals – Functions - Objects- Arrays –Built-in- Object, JavaScript Debuggers – Event Handling – Validation.

UNIT IV: SERVLETS AND JSP

(10)

Java Servlets: Architecture – Overview – Servlet Generating Dynamic Content-Life Cycle-Parameter Data-Sessions-Cookies; JSP : Overview – Running JSP Application – Basic JSP – JavaBeans Classes and JSP – Libraries and Files – MVC Paradigm.

UNIT V: XML AND WEB SERVICES

(8)

XML: Namespaces - XML Processing- -XML Documents- XSL – XSLT; Web services: WSDL-XML Schema – SOAP.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Jeffrey C.Jackson, "Web Technologies--A Computer Science Perspective", Pearson Education, 2006.
2. Deitel Deitel Nieto, "Internet & World Wide Web How To Program", 5th ed., 2012.

REFERENCE BOOKS:

1. Thomas A. Powell, "The Complete Reference HTML & CSS", 5th ed., 2010.
2. Steve Suehring, "JavaScript – Step by Step", PHI, 2nd ed., 2010.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x		x	x		x	x		x	x	x
2	x	x	x	x	x			x	x		x	x
3	x	x	x	x	x	x			x	x	-	x
4	x				x	x	x			x	x	x
5	x	x	x	x	x		x		x	x	x	x



13CS502 MOBILE COMPUTING

L	T	P	C
3	0	0	3

OBJECTIVES:

- To have deep knowledge about wireless communication and mobile technologies
- To understand the development environments and computing strategies
- To know the future trends in mobile technologies

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Understand the concept of wireless communication and mobile technologies

CO2 : Get knowledge about mobile device architecture.

CO3 : Develop applications that are used in mobile device using SDK

CO4 : Summarize the concept of resource and memory management in mobile devices

CO5 : Demonstrate current practice in Mobile computing contexts

UNIT I: WIRELESS COMMUNICATION TECHNOLOGIES (9)

Cellular networks, wireless 802.11, TCP/IP for mobile, Geo location and Geo positioning systems.

UNIT II: OVERVIEW OF MOBILE COMPUTING (9)

Overview of Mobile Technologies, Anatomy of mobile device, survey of mobile device, Applications of mobile device, Native vs Mobile applications, Architecture.

UNIT III: DEVELOPMENT ENVIRONMENT (9)

Introduction to Objective-C, Model view Controller Model, Mobile computing Software framework, Android SDK, iPhone SDK, Common user interface guidelines.

UNIT IV: MOBILE COMPUTING STRATEGIES (9)

Application Environment, Limited Resource Computing, Mobile Memory management, Low power Computing, Fault tolerance and Persistence, Security Issues

UNIT V: FUTURISTIC COMPUTING (9)

Upcoming Technologies, Convergence of Media and Communication devices, Case Studies

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Asoke K Taukder, Roopa R Yavagal, Mobile Computing, Tata McGraw Hill Publication Co., New Delhi, 2010.
2. Ivan Stojmenovic , Handbook of Wireless Networks and Mobile Computing, John Wiley & sons Inc, Canada, 2006.
3. Jonathan Loo, Jaime Lloret Mauri, Jesús Hamilton Ortiz, Mobile Ad Hoc Networks: Current Status and Future Trends , 2012.

REFERENCES:

1. J.Schiller, "Mobile Communication", Addison Wesley, 2009.
2. William Stallings, "Wireless Communication and Networks", Pearson Education, 2003.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1		x	x	x			x	x		x	x	x
2			x		x							x
3	x		x	x	x	x	x		x		x	x
4	x	x			x							x
5	x	x	x	x	x						x	x



Approved by Fourth Academic council

13CS503 OBJECT ORIENTED ANALYSIS AND DESIGN

L	T	P	C
3	0	0	3

OBJECTIVES:

- To learn the basics of Object Oriented analysis and design skills through an elaborate case study.
- To know about various methodologies.
- To use the UML design diagrams.
- To apply the appropriate design patterns.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Know about the object basics and object oriented life cycle.

CO2 : Identify classes and their relationships.

CO3 : Draw UML diagrams for various projects.

CO4 : Understand object oriented design process.

CO5 : Realize the need of software Quality and testing.

UNIT I: INTRODUCTION AND METHODOLOGY (10)

An Overview of Object Oriented Systems Development -Object Basics –Object Oriented Systems Development Life Cycle - Unified Approach - Rumbaugh Methodology –Booch Methodology - Jacobson Methodology -Patterns –Frameworks.

UNIT II: OBJECT ORIENTED ANALYSIS (9)

Identifying use cases -Object Analysis -Classification – Identifying Object - relationships -Attributes and Methods.

UNIT III: UNIFIED MODELING LANGUAGE (9)

Unified Modeling Language - introduction – UML Diagrams - Use case Diagram - class diagram Interaction Diagram –State chart Diagram - Activity Diagram – UML Meta Model.

UNIT IV: OBJECT ORIENTED DESIGN (9)

Design process and axioms -Designing Classes –Access Layer -Object Storage and Object Interoperability – View Layer – Designing Interface Objects- Prototyping the user interface.

UNIT V: SOFTWARE QUALITY AND TESTING (8)

Software Quality Assurance – Testing Strategies – Test cases – Test plan –System Usability and Measuring User Satisfaction – Usability testing – User satisfaction test – CASE STUDY.

TOTAL : 45 PERIODS

TEXT BOOK:

1. Ali Bahrami, “Object Oriented Systems Development”, Tata McGraw-Hill, 1999.

REFERENCE BOOKS:

1. Martin Fowler, "UML Distilled", Second Edition, PHI/Pearson Education, 2002.
2. Stephen R. Schach, "Introduction to Object Oriented Analysis and Design", Tata McGraw-Hill, 2003.
3. James Rumbaugh, Ivar Jacobson, Grady Booch "The Unified Modeling Language
4. Reference Manual", Addison Wesley, 1999.
5. Grady Booch, "Object Oriented Analysis & Design with applications", Pearson Education Asia, 2nd Edition, 2010.
6. Srimathi H, Sriram H, Krishnamoorthy A , "Object Oriented Analysis and Design using UML", SCITECH, Chennai, 2nd Edition 2006.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x		x				x	x	x	x
2	x	x	x	x	x			x	x	x	x	x
3	x	x	x	x	x	x	x	x	x	x	x	x
4	x	x	x	x	x	x	x	x	x	x	x	x
5		x	x	x	x		x	x	x	x	x	x



13IT404 THEORY OF COMPUTING

L	T	P	C
3	0	0	3

OBJECTIVES:

- To provide an understanding of the basic concepts in theoretical computer science.
- To comprehend complex concepts and formal proofs in theoretical computer science in order to improve reasoning and problem solving skills.
- To get ready for more advanced courses in automation theory, formal languages, algorithms & logic.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Learn the key properties of formal languages and Finite automata.

CO2 : Design and describe the strings recognized by regular languages.

CO3 : Understand the properties of context-free languages and grammars.

CO4 : Design a Turing machine that accomplishes a specific task.

CO5 : Demonstrate the undecidable and intractable classes of problems.

UNIT I: AUTOMATA

(9)

Strings, Alphabet, Language, Operations, Finite State Machine, definitions, finite automation model, acceptance of strings and languages, Non deterministic finite automation, deterministic finite automation, Equivalence between NFA and DFA, Conversion of NFA into DFA, minimization of FSM, Equivalence between two FSM's, Moore and Melay machines.

UNIT II: REGULAR EXPRESSIONS

(9)

Regular sets, regular expressions, identity rules, manipulation of regular expressions, equivalence between RE and FA, inter conversion, Pumping lemma, Closure properties of regular sets(proofs not required), regular grammars, right linear and left linear grammars equivalence between regular linear grammar and FA, interconversion between RE and RG.

UNIT III: CONTEXT FREE GRAMMARS

(9)

Context free Grammars, Derivation trees, Left Most Derivations, Right Most Derivations, Ambiguity in Context-Free Grammars, Specifications of Context Free Grammars, Normal Forms, Chomsky Normal Form (CNF), Greibach Normal Form (GNF).

UNIT IV: TURING MACHINE

(9)

Turing machine, definition, model, design of TM, Computable Functions, recursive enumerable language, Church's Hypothesis, Counter machine, Types of TM's(Proofs not required).

UNIT V: CLASSES OF PROBLEMS

(9)

Chomsky hierarchy of languages, linear bounded automats and context sensitive language, Introduction to DCFL and DPDA, LR(O) Grammar, decidability of problems, Universal Turing Machine, undecidability of posts correspondence problem. Turing reducibility, definition of P and NP problems, NP complete and NP hard problems.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Hopcroft, John E.; Motwani, Rajeev; Ullman, Jeffrey D., "Introduction to Automata Theory, Languages, and Computation", 3rd Ed, Pearson, 2013.
2. John C Martin, "Introduction to Languages and the Theory of Computation", Fourth Edition, Tata McGraw Hill Publishing Company, New Delhi, 2010.

REFERENCE BOOKS:

1. Kamala Krithivasan and Rama. R, "Introduction to Formal Languages, Automata Theory and Computation", Pearson Education 2009.
2. Lewis H.P. & Papadimitriou C.H., "Elements of Theory of Computation", Prentice Hall of India, 4th edition. 2007.
3. Mishra K L P and Chandrasekaran N, "Theory of Computer Science - Automata, Languages and Computation", Prentice Hall of India, New Delhi, Third Edition, 2004.
4. Harry R Lewis, Christos H Papadimitriou, "Elements of the Theory of Computation", Prentice Hall of India/Pearson Education, New Delhi, Second Edition, 2003.
5. Peter Linz, "An Introduction to Formal Language and Automata", Narosa Publishers, New Delhi, Fifth Edition, 2011.

Mapping of Course Outcomes (COs) and Programe Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x							x	x
2		x	x		x			x			x	x
3			x	x	x							x
4	x	x	x	x	x		x				x	x
5		x	x	x			x	x			x	x



13CS511- INTERNET AND WEB PROGRAMMING LABORATORY

L	T	P	C
0	0	3	2

OBJECTIVES :

- To understand the basic concepts of web programming and internet
- To understand how the client-server model of Internet programming works.
- To develop interactive, client-side, executable web applications.

COURSE OUTCOMES :

At the end of the course, the students will be able to

CO1 : Design a website using HTML and apply CSS concepts.

CO2 : Create a script using JavaScript.

CO3 : Develop an application using java servlet and MS-Access database.

CO4 : Develop an application using java Server page and MS-Access database.

CO5 : Create 3-tier application using JDBC

HTML:

1. Write a HTML program for Creation of web site with
 - Forms and Controls
 - Frames
 - Links
 - Tables

CSS :

2. Design a web site with horizontal menu-bar using HTML and CSS. Use Basic text Formatting and test CSS flow models.

Java Script:

3. Create a script that asks the user for a name, and alert the user if it is blank otherwise greets the user with "Hello" and the user name on the page
4. Create a script that collects numbers from a page and then adds them up and prints them to a blank field on the page.
5. Create a script that prompts the user for the numbers and stored in array and displaying in ascending order.
6. Create a script that will check the field in Assignment 1 for data and alert the user if it is blank. This script should run from a button.

Servlet:

7. Write a servlet program using HTTP Servlet.
8. Develop an Online application with data access using java servlet and MS-Access database.

JSP:

9. Develop an Online Applications using java server pages and MS-Access database.

JSP and Servlet:

10. Develop a simple web application

3tier:

11. Create a 3-tier application to access data base using JDBC.

Software required:

1. Java JDK
2. JDBC Drivers
3. Apache Tomcat Web Server
4. SQL Server

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1		x	x				x	x	x			x
2	x	x	x	x	x				x			x
3	x	x	x	x	x	x			x		x	x
4	x	x	x	x	x	x			x		x	x
5	x	x	x	x	x				x		x	x



13CS512 SOFTWARE ENGINEERING /CASE TOOLS LABORATORY

L	T	P	C
0	0	3	2

OBJECTIVES:

- To learn about the documentation of user requirements using the UML notation.
- To understand the various components of UML.
- To develop project modules using tools

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Outline The Project Scope And Objectives.

CO2 : Write The Software Requirement Analysis.

CO3 : Create Data Modelling.

CO4 : Develop And Debug Projects.

CO5 : Generate Test Cases Using Testing Strategies.

Prepare the following documents for each project and develop the software using software engineering methodology.

1. Problem Analysis and Project Planning - study of the problem, Identify project scope, Objectives, and infrastructure
2. Software Requirement Analysis - Phases/ modules of the project, Identify deliverables.
3. Data Modeling - use work products, data dictionary and UML diagrams.
4. Software Development and Debugging.
5. Software Testing - Prepare test plan, perform validation testing, coverage analysis, memory leaks, develop test case hierarchy, Site check and site monitor.

SAMPLE PROJECTS:

1. Course Registration System
2. Quiz System
3. Online ticket reservation system
4. Remote computer monitoring
5. Student marks analyzing system
6. Expert system to prescribe the medicines for the given symptoms
7. ATM system
8. Platform assignment system for the trains in a railway station
9. Stock maintenance
10. E-mail Client system.

Software Required:

Case Tools : Rational Suite, Win runner, Empirix, Pencil Tool

Languages : C/C++/JDK 1.3,JSDK, INTERNET EXPLORER, UML

Front End : VB, VC++, Developer 2000

Back End : Oracle, MS-Access, SQL

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x					x		x	x
2	x	x	x	x	x				x		x	x
3	x	x	x	x	x				x		x	x
4	x	x	x	x	x	x	x		x		x	x
5	x	x	x	x	x	x	x		x		x	x



13CS513 MINI PROJECT

L	T	P	C
0	0	2	1

OBJECTIVES:

- To get hands on training in the development of one or more modules of a project or software package.

COURSE OUTCOMES:

At the end of the course, student will be able to

CO1 : Identify the problem definition and gather the requirements

CO2 : Analyse the feasibility of the project

CO3 : Formulate a design and use programming principles to develop projects

CO4 : Test and validate the project modules

CO5 : Deploy project modules and help in its maintenance.

The mini-project involves the following stages:

METHODOLOGY	<ul style="list-style-type: none"> Maximum four students per batch. Faculty guide will be allotted for each batch by the HOD. By mutual discussion, the faculty guide will assign a title in the general /subject area to the student. Students have to refer the Journals and magazine and collect the published literature. Using OHP/Power Point, the student has to make presentation for 15 -20 minutes followed by 10 minutes discussion. Each batch have to do the project and present the progress of the project by two project reviews ,one at the middle and the other near the end of the semester. The student batches have to write a Technical Report for about 25 -30 pages (Title page, One page Abstract, Review of Research paper under various subheadings, Concluding Remarks and List of References). The technical report has to be submitted to the HOD one week before the final presentation, after the approval of the faculty guide. 	
EXECUTION	Week	Activity
	I	Allotment of Faculty Guide by the HoD
	II	Collection of Technical papers
	III- IV	Finalizing the title with the approval of Faculty Guide
	V	First Project Review
	VI	Progress of the Project
	VII	Second Project Review
	VIII	Report Preparation
	IX	Report submission
	X-XI	Demo & Final presentation
EVALUATION	<ul style="list-style-type: none"> 50% by Continuous Assessment + 50% by end semester examination 2 Hrs/week and 2 credit 	
	Component	Weightage
	First Project Review	25%
	Second Project Review	25%
	Project Report	30%
	Demo & Final presentation	20%
	Total	100%

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x	x				x	x		x
2	x	x		x		x	x		x			x
3	x	x		x	x				x			x
4	x	x				x			x			x
5			x	x						x		x



Approved by Fourth Academic council

13PT511 VERBAL APTITUDE AND REASONING – I

L	T	P	C
0	0	2	0

OBJECTIVES :

- To develop students to workout solution for problems that involves mathematics aptitude.
- To develop students to workout solutions for problems that involving general reasoning.
- To develop students to become sharp in usage of English grammar.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Solve aptitude problems with ease.

CO2 : Solve reasoning problems with ease.

CO3 : Improve written communication skills in English.

UNIT I - VERBAL

(24)

Tense – Articles - Preposition - Subject Verb agreement - Sentences completion - Sentence Improvement- Incorrect sentences - Jumble sentence – Basic sentence structures – Voices – Auxiliary verb – Modal Auxiliaries – One word substitution.

UNIT II – REASONING

(12)

Odd man out - Number series - Diagrammatic question - Non verbal reasoning - Venn Diagram - Syllogism-Coding & decoding - Seating arrangement, Height arrangement.

UNIT III –APTITUDE

(12)

Number system – Matrix – Average – Percentage – Age - Ratio & Proportion – Partnership - Profit & loss - Mixture & Allegation.

TOTAL: 48 PERIODS

TEXT BOOKS:

1. Verbal Book by Kaushal.B.Shah.
2. Reasoning & Aptitude Book by Vignesh.D.

REFERENCES:

1. Quantitative Aptitude by Dinesh Khattar, Pearson Education India, 2008.
2. Objective English by Hari Mohan Prasad & Uma Rani Sinha 5th Edition, Mc- Graw hill Education India P Ltd.2009.
3. A Modern approach to verbal & non verbal reasoning by R.S.Aggarwal. S.Chand Publication, 2012.
4. High school English Grammar & Composition by Wren & Martin S.Chand Publication 1st Edition, 1995.

Continuous Assessment Rubrics:

Sl. No.	Evaluation Activities	Mark Allotment	Type of Questions	
1	Written	50	Objective type	Average of Ten tests will be taken
Internal Total		50		

Final Assessment Rubrics:

Sl. No.	Evaluation Activities	Mark Allotment	Type of Questions
1	Written Test	50	Objective type
Final Total		50	

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1									x	x		x
2									x	x		x
3									x	x		



SEMESTER-VI

13GE404 STATISTICS AND NUMERICAL METHODS

L	T	P	C
3	1	0	4

OBJECTIVE:

- To enable the student to solve various statistical and numerical problems by understanding the basic concepts.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Apply the testing of hypothesis, goodness of fit and attributes.

CO2 : Perform analysis of variance and design of experiments

CO3 : Select the appropriate numerical technique to solve a given engineering problem.

CO4 : Generate the approximate solution to a system of differential equations;

CO5 : Perform statistical inference tasks using software and to specify the calculations involved in such tasks and to be aware of assumptions necessary for the validity of results.

UNIT - I TESTING OF HYPOTHESIS

(9+3)

Sampling distributions – Tests for single mean, Proportion, Difference of means (large and small Samples – t, F, chi square test) – Tests for single variance and equality of variances– chi-square test for goodness of fit (Binomial distribution only) – Independence of attributes.

UNIT - II DESIGN OF EXPERIMENTS

(9+3)

Completely randomized design – Randomized block design – Latin square design – 22 – factorial design.

UNIT - III SOLUTION OF EQUATIONS

(9+3)

Newton-Raphson method– Single variables– Regula falsi method– Gauss Elimination method –Pivoting-Gauss-Jordan methods – Iterative methods of Gauss-Jacobi and Gauss-Seidel– Matrix Inversion by Gauss-Jordan method– Relaxation method.

UNIT - IV INTERPOLATION, NUMERICAL DIFFERENTIATION AND NUMERICAL INTEGRATION

(9+3)

Introduction of operators– Newton’s forward and backward difference interpolation for equal intervals- Lagrange’s and Newton’s divided difference interpolation for unequal intervals –Approximation of derivatives using interpolation polynomials– Numerical Integration using Trapezoidal rule, Simpson’s 1/3 rule and 3/8 rule .

UNIT - V INITIAL AND BOUNDARY VALUE PROBLEM IN ORDINARY DIFFERENTIAL EQUATIONS

(9+3)

Taylor’s series method – Euler’s method –Modified Euler’s method – Fourth order Runge-Kutta method for solving first and second order equations – Milne’s predictor & corrector methods for solving first order equations– Finite difference methods for solving second order ordinary differential equation.

TOTAL: 60 PERIODS

TEXT BOOKS:

1. A. Johnson Richard and C.B.Gupta, “Miller & Freund”s Probability and Statistics for Engineers”, 7th ed., Pearson Education, 2006.
2. P.Kandasamy, K.Thilagavathy and K.Gunavathy, “Numerical Methods – Vol: IV”, S.Chand & Co. Ltd. New Delhi, 2003.

REFERENCES:

1. Walpole, Ronald. E, Myers, Sharon. L, and Ye. Keying, “Probability and Statistics for Engineers and Scientists”, 8th ed., Pearson Education, 2007.
3. Spiegel, M.R. J. Schiller and Srinivasan. R.A, “Schaum”s Outlines Probability and Statistics”, 3rd ed., Tata McGraw Hill, New Delhi, 2010.
4. Chapra. C, Steven and Canale. P, Raymond, “Numerical Methods for Engineers”, 5th ed., Tata McGraw Hill, New Delhi, 2007.
5. Grewal. B.S and Grewal. J.S, “Numerical methods in Engineering and Science”, 6th ed., Khanna Publishers, New Delhi, 2004.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x		x	x	x	x			x	x
2	x	x	x		x		x	x		x	x	x
3	x	x	x	x		x	x	x			x	x
4	x	x	x	x				x	x		x	x
5	x	x					x	x			x	x



13CS601 GRAPHICS AND MULTIMEDIA

L	T	P	C
3	0	0	3

OBJECTIVES:

- To introduce the graphics mode, with the help of basic algorithms and methodologies.
- To equip students with fundamental knowledge and basic technical competence in the field of computer graphics.
- To provide an understanding of how a computer draws the fundamental graphics primitives.
- To learn the implementation of Computer Graphics Algorithms.
- To learn the principles and different components of multimedia.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Design two dimensional graphics and two dimensional transformations.

CO2 : Design three dimensional graphics and three dimensional transformations.

CO3 : Apply color models and clipping techniques to graphics.

CO4 : Create basic multimedia presentations.

CO5 : Design animation sequences.

UNIT - I FUNDAMENTALS

(9)

Introduction to Computer Graphics - Raster and vector graphics systems - Output primitives - points and lines - line drawing algorithms - loading the frame buffer - line function - circle and ellipse generating algorithms - Pixel addressing and object geometry - filled area primitives - anti-aliasing

UNIT - II 2D-3D REPRESENTATION AND MANIPULATION

(9)

2D Transformation: Translation, rotation, scaling, reflection and shearing - Matrix and homogeneous coordinates - Composite 2D transformations - 2D Viewing - Clipping : line, polygon and text clipping.

3D Transformation: Translation, rotation, scaling, reflection, shearing -Composite 3D transformation - 3D Viewing - Projection - 3D clipping – Case Study.

UNIT - III VISIBLE SURFACE DETECTION AND COLOR MODELS

(9)

Back face detection - Depth buffer method - A-Buffer method -Scan line method - Depth sorting method - BSP -Tree method - Area Subdivision method - Octree method - Ray casting - Curved surfaces - Wireframe methods - Visibility Detection Functions - Color Models - RGB, CMY, HSV, HLS, CIE models

UNIT - IV INTRODUCTION TO MULTIMEDIA

(9)

Branch-overlapping Aspects of Multimedia - Content - Global Structure - Multimedia: Media and Data Streams - Medium - Main Properties of a Multimedia System - Traditional Data Stream Characteristics - Data Streams Characteristics for Continuous Media - Information Units-Virtual Reality.

UNIT - V AUDIO, VIDEO AND ANIMATION

(9)

Basic principles of animation - Sound Concepts - Music - Speech - Computer-based Animation - Data Compression - storage Space - Coding Requirements - Source - Entropy and Hybrid Coding - Some Basic Compression Techniques - JPEG, H.261, MPEG, DVI.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Donald Hearn and Pauline Baker, Computer Graphics, Prentice Hall, New Delhi, 2012.
2. Ralf Steinmetz and Klara Mahrstedt, "Multimedia computing, communications and a Applications", Pearson Education Asia, 6th impression 2009.

REFERENCE BOOKS:

1. Ranjan Parekh, "Principles of Multimedia", Tata McGraw-Hill, 2007.
2. John F. Hughes, Andries Van Dam, Morgan Mc Guire ,David F. Sklar , James D. Foley, Steven K. Feiner and Kurt Akeley , " Graphics: Computer Principles and Practice", , 3rd Edition, Addison- Wesley Professional, 2013.
3. Ami Chopine, 3D Art Essentials: The fundamentals of 3D modeling and animation, Elsevier, 2011.
4. K.Rao, "Multimedia Communication Systems: Techniques, Standards, and Networks", Prentice Hall, 1st edition, 2002
5. http://minyos.its.rmit.edu.au/aim/a_notes/anim_principles.html
6. http://en.wikipedia.org/wiki/12_basic_principles_of_animation#External_links

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x		x						x
2	x	x	x	x		x						x
3	x	x	x	x	x	x						x
4	x	x	x	x	x	x						x
5	x	x	x	x	x	x						x



13CS602 OPEN SOURCE TOOLS AND DEVELOPMENT

L	T	P	C
3	0	0	3

OBJECTIVES:

To understand the need of open source software

- To gain knowledge about MySQL and PHP
- To create Software applications that can be accessed by all the people over the internet and to allow the users to customize the software based on their requirements.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Know the basic concepts of open source and LINUX

CO2 : Understand the basics of PHP and create a code for Control Structures, function, Arrays

CO3 : Develop a webpage using PHP

CO4 : Know how to configure web server and MySQL

CO5 : Design an application using python

UNIT - I OPEN SOURCE OPERATING SYSTEM

Introduction to Open sources – Need of Open Sources – Advantages of Open Sources– Application of Open Sources – Open Source Licenses. LINUX: Operating System – Installation – Processes – User Management – File Systems – Linux commands – Shell Scripts and Programming.

UNIT - II PHP

PHP : Introduction – Configuring Your Environment – PHP Basics - Data types – Identifiers - Variables – Constants – Operators – String Interpolation – Control Structures – Functions – Arrays.

UNIT - III PHP WEB DEVELOPMENT (9)

Error and Exception Handling - Strings and regular expression – Working with Files – Date and Time - Handling File Uploads - Forms – Authentication – Sending and Receiving E – Mails.

UNIT - IV WEB SERVER AND TOOLS (9)

Web Server: Apache Web server – Working with Web Server – Configuring and Using apache web services - MySQL: Introduction – Installing and configuring MySQL – Data Types – Working with Databases and Tables – PHP and LDAP – PHP and MySQL Connectivity - Open Source Software tool - Model driven architecture tools.

UNIT – V PYTHON (9)

Overview of PYTHON - Syntax and Style – Python Objects – Numbers – Sequences – Strings – Lists and Tuples – Dictionaries – Conditionals and Loops – Files – Input and Output – Errors and Exceptions – Functions – Modules.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Hitesh Singh, Nidhi Arora, “Linux and X-WINDOWS PROGRAMMING” First Edition, S.K. Kataria & Sons, New Delhi, 2011.
2. W. Jason Gilmore, “Beginning PHP and MySQL: From Novice to Professional”, Third Edition, Apress, USA, 2010.
3. Wesley J. Chun, “Core Python Programming”, Prentice Hall, 2001

REFERENCES:

1. Richard Petersen “The Complete Reference Linux “, sixth edition, Tata McGraw Hill Edition 2010.
2. VikramVaswani, “MYSQL: The Complete Reference”, 2nd Edition, Tata McGraw- Hill Publishing Company Limited, Indian Reprint 2009.
3. Steven Holzner, “PHP: The Complete Reference”, 2nd Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint 2009.
4. Peter Wainwright, “Professional Apache”, Wrox Press, USA, 2002.
5. <http://www.w3schools.com/php/default.asp>
6. <http://opensource.org/osd>

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x	x		x	x	x		x	x
2	x					x						x
3	x	x	x	x	x	x	x		x		x	x
4	x	x	x	x	x	x	x	x	x		x	x
5	x	x	x	x	x				x		x	x



13CS603 PRINCIPLES OF COMPILER DESIGN

L	T	P	C
3	0	0	3

OBJECTIVES:

- To know the design and implementation of assembler, linkers and loaders.
- To understand, design and implement a lexical analyzer.
- To understand, design and implement a parser.
- To learn and design code generation schemes.
- To understand optimization of codes and runtime environment.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Understand the uses of assembler and loader.

CO2 : Describe the design phases of a compiler.

CO3 : Generate intermediate code for the given source code.

CO4 : Design a code generator.

CO5 : Learn the code optimization techniques to improve the performance of a program.

UNIT I: SYSTEM SOFTWARE (9)

Basic assembler functions - Program relocation - Literals – Symbol-defining statements – Expressions - One pass assemblers and Multi pass assemblers - Basic loader functions - Design of an Absolute Loader - Relocation – Program Linking - Basic macro processor functions - Macro Definition and Expansion.

UNIT II: LEXICAL ANALYSIS AND SYNTAX ANALYSIS (9)

Introduction to Compiling - Compilers-Analysis of the source Program-The phases of a Compiler – Cousins of a Compiler - The grouping of phases -Compiler construction tools. The role of the lexical analyzer-Input buffering- -A language for specifying lexical analyzer. Syntax Analysis – The role of a parser – Context free grammar – Top down Parsing – Bottom up parsing – LR parsers – Construction of a simple SLR, CLR and LALR parsing table – Storage allocation strategies.

UNIT III: INTERMEDIATE CODE GENERATION (9)

Intermediate languages – Declarations – Assignment statements – Boolean expressions – Case statements – Back patching – Procedure calls.

UNIT IV: CODE GENERATION (9)

Issues in the design of a code generator – The Target machine – Run time storage management – Basic blocks and flow graphs – A simple code generator – Register allocation and assignment – The DAG representation of basic blocks – Generating code from DAGS.

UNIT V: CODE OPTIMIZATION (9)

Introduction – The Principle sources of Optimization – Peephole Optimization – Optimization of basic blocks – Loops in flow graphs – Introduction to global data flow analysis – Code improving transformation.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Leland L. Beck, “System Software – An Introduction to Systems Programming”, 3rd Edition.
2. Alfred V. Aho, Ravi Sethi Jeffrey D. Ullman, “Compilers – Principles, Techniques, and Tools”, Pearson Education Asia, 2007.

REFERENCE BOOKS:

1. D. M. Dhamdhere, “Systems Programming and Operating Systems”, Second Revised Edition, Tata McGraw-Hill, 2000.
2. Steven S. Muchnick, “Advanced Compiler Design & Implementation”, Morgan Kaufmann Publishers, 2000.
3. C. N. Fisher and R. J. LeBlanc “Crafting a Compiler with C”, Pearson Education, 2000.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x								x
2	x	x	x	x								x
3	x	x	x	x								x
4	x	x	x	x								x
5	x	x	x	x								x



13CS604 EMBEDDED SYSTEMS

L	T	P	C
3	0	0	3

OBJECTIVES:

- Learn the architecture and programming of ARM processor.
- Be familiar with the embedded computing platform design and analysis.
- Be exposed to the basic concepts of real time Operating system and distributed embedded systems
- Learn to do embedded program using Arduino.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Describe the architecture and programming of ARM processor.

CO2 : Outline the concepts of embedded systems

CO3 : Explain the basic concepts of real time Operating system design and distributed embedded systems.

CO4 : Develop Arduino applications.

CO5 : Model real-time applications using embedded-system concepts

UNIT I: INTRODUCTION TO EMBEDDED COMPUTING AND ARM PROCESSORS (9)

Complex systems and micro processors– Embedded system design process –Design example: Model train controller- Instruction sets preliminaries - ARM Processor – CPU: programming input and output-supervisor mode, exceptions and traps – Co-processors- Memory system mechanisms – CPU performance- CPU power consumption.

UNIT II: EMBEDDED COMPUTING PLATFORM DESIGN (9)

The CPU Bus-Memory devices and systems–Designing with computing platforms – consumer electronics architecture – platform-level performance analysis - Components for embedded programs- Models of programs- Assembly, linking and loading – compilation techniques- Program level performance analysis – Software performance optimization – Program level energy and power analysis and optimization – Analysis and optimization of program size- Program validation and testing.

UNIT III : DISTRIBUTED EMBEDDED SYSTEMS AND REAL TIME OPERATING SYSTEMS (9)

Distributed embedded systems – Network abstractions – CAN bus – Distributed computing in cars and airplanes – I²C bus - MPSoCs and shared memory multiprocessors - Real time operating systems- POSIX - Windows CE

UNIT IV: ARDUINO PROGRAMMING (9)

Introduction to Arduino-Creating Arduino programming environment –Using the Arduino IDE – Creating the Arduino Program – Working with variables - Structured Commands – Programming loops – Working with strings – Implementing data structures – Creating functions – Storing data – Using Libraries – Working with digital interfaces – Interfacing with analog devices – Communicating with devices.

UNIT V : CASE STUDY (9)

Data compressor - Alarm Clock - Audio player - Software modem-Digital still camera - Telephone answering machine-Engine control unit – Video accelerator.

TOTAL: 45 PERIODS

Approved by Fourth Academic council

TEXT BOOKS:

1. Marilyn Wolf, “Computers as Components - Principles of Embedded Computing System Design”, Third Edition “Morgan Kaufmann Publisher (An imprint from Elsevier), 2012. (UNIT I,II,III,V)
2. Richard Blum, “Arduino Programming in 24 hours” Pearson Education 2015. (UNIT IV).

REFERENCE BOOKS:

1. Jonathan W.Valvano, “Embedded Microcomputer Systems Real Time Interfacing”, Third Edition Cengage Learning, 2012.
2. Raymond J.A. Buhr, Donald L.Bailey, “An Introduction to Real-Time Systems- From Design to Networking with C/C++”, Prentice Hall, 1999.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x		x							x
2	x	x	x		x							x
3	x	x	x		x							x
4	x	x	x	x	x	x	x	x	x		x	x
5	x	x	x	x	x	x	x	x	x		x	x



13CS611 GRAPHICS AND MULTIMEDIA LABORATORY

L	T	P	C
0	0	3	2

OBJECTIVES:

- To understand the need of developing graphics applications.
- To learn the hardware involved in building graphics applications.
- To learn algorithmic development of graphics primitives like: line, circle, ellipse, polygon etc.
- To learn the representation and transformation of graphical images and pictures.
- To illustrate the impact of animations.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Draw basic shapes such as lines, circle and ellipse.

CO2 : Perform processing of basic shapes by various processing algorithms /techniques.

CO3 : Apply the transformations to the basic shapes.

CO4 : Apply various clipping algorithms.

CO5 : Design animation sequences.

LIST OF EXPERIMENTS

1. Implementation of Line Drawing Algorithms
 - a) DDA
 - b) Bresenham
2. Implementation of Bresenham's Circle and Ellipse Generation Algorithm
3. Implementation of Two Dimensional Transformations
4. Composite 2D Transformations
5. Implementation of Cohen-Sutherland Line Clipping Algorithm
6. Implementation of 3D Transformations
7. Composite 3D Transformations
8. Animation using Image Effects Generator.
9. Game development using Flash
10. Video Editing

Software required:

1. Eclipse Software
2. Adobe Premiere (iMovie, Jaycut)
3. Adobe Photoshop
4. Adobe Flash

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x	x							x
2	x	x	x	x	x							x
3	x	x	x	x	x							x
4	x	x	x	x	x							x
5	x	x	x	x	x							x



Approved by Fourth Academic council

13CS612 OPEN SOURCE LABORATORY

L **T** **P** **C**
0 **0** **3** **2**

OBJECTIVES:

- To gain knowledge on LINUX configuration and installation
- To gain knowledge on open source database
- To understand and apply open source programming language
- To develop web applications
- To understand how to configure web server

COURSE OUTCOMES:

At the end of the course, the students will be able to

- CO1 : Install Linux in all modes.
CO2 : Know how commands in LINUX, shell scripts and programming works
CO3 : Develop a web page using PHP.
CO4 : Install and configure the web server
CO5 : Create an application using Python.

LIST OF EXPERIMENTS

1. A. Installation of LINUX OS in different modes
B. Installation of LINUX in Dual mode and Virtualization environment.
2. Basic Linux commands.
3. Shell Programming & C programming
4. PHP Script (Statements, Array, Functions and File handling)
5. PHYTON programming
6. Web Server installation and Configuration
7. Web Development (Mini project)

TOTAL: 45 PERIODS

Software required:

1. Linux Software (Fedro, Redhat, Ubuntu)
2. Virtual Machine
3. Phyton Software
4. Web Server (XAMP, Wamp Server)

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x						x	x		x		
2	x		x				x			x		x
3	x	x	x				x	x			x	
4	x	x	x				x				x	x
5	x	x	x			x	x	x	x	x	x	x



Approved by Fourth Academic council

13GE611 COMPREHENSION

L	T	P	C
0	0	2	1

OBJECTIVES:

- To encourage the students to comprehend the knowledge acquired from the first Semester to Sixth Semester of B.E Degree Course through periodic exercise.

COURSE OUTCOMES:

At the end of the course, student will be able to

- CO1 : Understand and comprehend any given problem related to computer science & engineering field.

METHOD OF EVALUATION:

- The students will be assessed 100% internally through weekly test with objective type questions on all the subject related topics.

TOTAL: 30 PERIODS

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x		x						x	x



13PT611 VERBAL APTITUDE AND REASONING - II

L	T	P	C
0	0	2	0

OBJECTIVES :

- To develop students to workout solution for problems that involves mathematics aptitude.
- To develop students to workout solutions for problems that involving general reasoning.
- To develop students to become sharp in usage of English grammar.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Solve aptitude problems with ease.

CO2 : Solve reasoning problems with ease.

CO3 : Improve written communication skills in English.

UNIT I - VERBAL

(24)

Error spotting-Confusable words- Idioms & phrases-Synonyms & Antonyms-Statement & Arguments-Reading comprehension-Theme detection- Transformation of sentences – Degrees of Comparison – Modifiers – Phrasal verbs - Connectives.

UNIT II – REASONING

(12)

Logical Puzzle-Cube problems-Analogy-Blood Relations-Directions-Data Interpretation-Data sufficiency-Statement & Assumption.

UNIT III –APTITUDE

(12)

Simple and Compound Interest-Probability-Permutation and Combination-Speed & Distance-Train-Time & Work- Pipes & cisterns-Calendar-Clock-Volume & surface areas.

TOTAL: 48 PERIODS

TEXT BOOKS:

1. Verbal Book by Kaushal.B.Shah.
2. Reasoning & Aptitude Book by Vignesh.D.

REFERENCE BOOKS:

1. Quantitative Aptitude by Dinesh Khattar, Pearson Education India, 2008.
2. Objective English by Hari Mohan Prasad & Uma Rani Sinha 5th Edition, Mc- Graw hill Education India P Ltd.2009.
3. A Modern approach to verbal & non verbal reasoning by R.S.Aggarwal. S.Chand Publication, 2012.
4. High school English Grammar & Composition by Wren & Martin S.Chand Publication 1st Edition, 1995.

Continuous Assessment Rubrics:

Sl. No.	Evaluation Activities	Mark Allotment	Type of Questions	
1	Written	50	Objective type	Average of Ten tests will be taken
Internal Total		50		

Final Assessment Rubrics:

Sl. No.	Evaluation Activities	Mark Allotment	Type of Questions
1	Written Test	50	Objective type
Final Total		50	

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1									x	x		x
2									x	x		x
3									x	x		



ELECTIVES-1

13CSX01 DATA SCIENCE

L	T	P	C
3	0	0	3

OBJECTIVES:

- To understand the Lifecycle of data science projects.
- To apply various techniques for mining data stream.
- To analyze the data using classification techniques.
- To understand the clustering and analysis methods.
- To apply visualization techniques to clearly communicate analytic insights to business sponsors, analytic audiences and use tools like Hadoop, Giraph.

COURSE OUTCOMES:

At the end of the course, the students will be able to

- CO1 : Know the basics of data science and big data field.
- CO2 : Design efficient techniques for mining large volumes of data in engineering applications.
- CO3 : Deploy the technique of classification and prediction in data science
- CO4 : Understand about the clusters and analyze the big data for useful business applications.
- CO5 : Apply tools like Hadoop, Giraph and storm to implement real time applications.

UNIT I - INTRODUCTION

(9)

Data Science – Related fields – Data Scientist – Roles - Data mining – limits on data mining - Big Data - Computing Environment - NoSQL Stores – Hadoop and Map Reduce Architecture - Life cycle of data science project.

UNIT II - DATA AND RELATIONS

(9)

Data scales - Set and Matrix Representations - Relations - Similarity Measures - Dissimilarity Measures - Sequence Relations - Sampling and Quantization.

UNIT III - CLASSIFICATION

(9)

Criteria, Naive Bayes Classifier, Linear Discriminant Analysis, Regression - Support Vector Machine, Nearest Neighbor Classifier, Learning Vector Quantization, Decision Trees.

UNIT IV - CLUSTERING AND ANALYSIS

(9)

Cluster analysis - K-means - Hierarchical clustering - Time series analysis - Recommendation Systems - Text analysis.

UNIT V - DATA VISUALIZATION AND ENGINEERING

(9)

Diagrams, Principal Component Analysis- Multidimensional Scaling - Histograms - Spectral Analysis - MapReduce - Bulk Synchronous Parallel Distributed Computation - Event Processing - Case Studies: Hadoop, Giraph, Storm.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Thomas. A. Runkler 2012, “Data Analytics: Models and algorithms for Intelligent Data Analysis”, Springer, Germany.
2. Jared Dean 2014, “Big Data, Data Mining and Machine learning”, Wiley publications.
3. Anand Rajaraman and Jeffrey David Ullman, 2011, “Mining of Massive data sets”, Cambridge University press.
4. Donald Miner, Map Reduce Design Patterns: “Building Effective Algorithms and Analytics for Hadoop and Other Systems”, O'Reilly Media, 2012.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x	x							x
2	x	x	x	x	x							x
3	x	x	x	x	x							x
4	x	x	x	x	x							x
5	x	x	x	x	x							x



13CSX02 DATA WAREHOUSING AND DATA MINING

L	T	P	C
3	0	0	3

OBJECTIVES:

- To understand the basic principles, concepts and applications of data warehousing and data mining.
- To enlighten the concepts of data warehousing and architecture of data mining.
- To make the students to understand association rule mining.
- To learn the importance of supervised learning and relevant algorithms.
- To learn the importance of unsupervised learning algorithms and recent trends.

COURSE OUTCOMES:

At the end of the course, the students will be able to

- CO1 : Identify and use of various data warehousing components functionalities
- CO2 : Analyze the techniques of data mining and data warehousing models.
- CO3 : Design, implement and evaluate a system using association mining,
- CO4 : Apply and work with classification and Prediction algorithms.
- CO5 : Apply and work with clustering algorithms and recent trends.

UNIT I: DATA WAREHOUSING (9)

Need for Data Warehousing – Data Warehouse Architecture –Multidimensional Data Model –Schemas for Multidimensional Data Model- OLAP Operations – Types of OLAP Server – Data warehouse Implementation.

UNIT II: DATA MINING CONCEPTS (9)

Introduction to Data mining – Types of Data –Functionalities of data mining- Architecture of a typical data mining system– Statistical Descriptions of Data – Data Visualization – Major Issues in Data Mining – Data Preprocessing: Data Cleaning – Data Integration – Transformation – Data Reduction – Data Discretization and Concept Hierarchy Generation.

UNIT III: FREQUENT PATTERN MINING (9)

Basic Concepts – Market Basket Analysis – Frequent Item Set Mining Methods – Apriori Algorithm – FP Growth Algorithm – Pattern Evaluation Methods–Correlation Analysis –Mining multilevel and multidimensional associations.

UNIT IV: CLASSIFICATION AND PREDICTION (9)

Issues Regarding Classification and Prediction – Decision Tree Induction– Bayesian Classification – Rule–Based Classification – Other Classification Methods– Prediction: Linear – Non Linear Regression– Accuracy and Error Measures.

UNIT V: CLUSTERING AND TRENDS IN DATA MINING (9)

Cluster Analysis: Basic Concepts – Partitioning Methods – Hierarchical Methods – Density Based Methods – Outlier Analysis – Distance – Based Outlier Detection – Density – Based Outlier Detection – Data Mining Trends: Mining Complex Data Types – Applications Of Data Mining.

TOTAL: 45 PERIODS

TEXT BOOK:

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. Alex Berson and Stephen J. Smith, "Data Warehousing, Data Mining and OLAP", Tata McGraw – Hill Edition, Thirteenth Reprint 2008.
2. Margaret H. Dunham, Data Mining: Introductory and Advanced Topics, Prentice Hall 2006
3. G. K. Gupta, "Introduction to Data Mining with Case Studies", Eastern Economy Edition, Prentice Hall of India, 2006.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

MAPPING OF COS AND POS												
COS	POS											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x											
2	x	x	x								x	x
3	x	x	x	x		x					x	x
4	x	x	x	x		x					x	x
5	x	x	x	x	x	x					x	x



13CSX03 ADVANCED DATABASE TECHNOLOGIES

L	T	P	C
3	0	0	3

PREREQUISITE: Database systems

OBJECTIVES:

- To acquire knowledge on parallel and distributed databases and its applications.
- To study the usage and applications of Object Oriented database
- To understand the usage of advanced data models.
- To acquire inquisitive attitude towards research topics in databases like cloud database and NoSQL.

COURSE OUTCOMES:

At the end of the course, the students will be able to

- CO1 : Select the appropriate high performance database like parallel and distributed database.
- CO2 : Model and represent the real world data using object oriented database.
- CO3 : Design a semantic based database to meaningful data access
- CO4 : Work with cloud databases.
- CO5 : Demonstrate competency in designing and selecting a particular NoSQL database for specific use cases.

UNIT I: PARALLEL DATABASES (9)

Database System Architectures: Centralized and Client-Server Architectures – Server System Architectures – Parallel Systems- Distributed Systems – Parallel Databases: I/O Parallelism – Inter and Intra Query Parallelism – Inter and Intra operation Parallelism – Design of Parallel Systems

UNIT II: DISTRIBUTED DATABASES (9)

Distributed Database Concepts - Distributed Data Storage – Distributed Transactions – Commit Protocols – Concurrency Control – Distributed Query Processing – Case Studies

UNIT III: OBJECT BASED DATABASES (9)

Concepts for Object Databases: Object Identity – Object structure – Type Constructors – Encapsulation of Operations – Methods – Persistence – Type and Class Hierarchies – Inheritance – Complex Objects – Object Database Standards, Languages and Design: ODMG Model – ODL – OQL .

UNIT IV: CLOUD DATABASE (9)

Cloud Based Databases: Data Storage Systems on the Cloud- Cloud Storage Architectures-Cloud Data Models- Query Languages- Introduction to Big Data-Storage

UNIT V: NOSQL (9)

NoSQL Introduction – Differences from relational databases – Column family store- Document stores – key-value databases – Graph databases – Choosing a NoSQL database.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. R. Elmasri, S.B. Navathe, “Fundamentals of Database Systems”, Sixth Edition, Pearson Education / Addison Wesley.
2. Eric Redmond; Jim R. Wilson. Seven Databases in Seven Weeks: A Guide to Modern Databases and the NoSQL Movement. Pragmatic Bookshelf. 2012.

REFERENCE BOOKS:

1. Thomas Cannolly and Carolyn Begg, "Database Systems, A Practical Approach to Design, Implementation and Management", sixth Edition, Pearson Education.
2. Henry F Korth, Abraham Silberschatz, S. Sudharshan, "Database System Concepts", Sixth Edition, McGraw Hill.
3. C.J.Date, A.Kannan and S.Swamynathan,"An Introduction to Database Systems", Eighth Edition, Pearson Education.
4. Pramod J. Sadalage; Martin Fowler. NoSQL Distilled: A Brief Guide to the Emerging World of Polyglot Persistence. Addison-Wesley. 2012.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x	x						x	x
2	x	x	x	x	x						x	x
3		x	x	x	x			x	x		x	x
4	x	x	x	x	x						x	x
5	x	x	x	x	x			x	x		x	x



13CSX04 TOTAL QUALITY MANAGEMENT

L	T	P	C
3	0	0	3

OBJECTIVES:

- To learn about Quality, Quality cost and basic concepts of Total Quality Management.
- To learn TQM principles.
- To make familiar with the statistical fundamentals and quality control tools.
- To introduce about tools used in TQM.
- To create an awareness about the ISO and Quality System process.

COURSE OUTCOMES:

At the end of the course, the students will be able to

- CO1 : Understand the fundamental concepts of TQM and aware of Quality and its cost.
- CO2 : Get knowledge about principles of total quality management.
- CO3 : Choose appropriate statistical techniques for analyzing and improving the processes.
- CO4 : Implement TQM tools in our organization's improvement.
- CO5 : Aware of Quality system certification process and its need for the industry.

UNIT I: INTRODUCTION

(9)

Definition of Quality, Dimensions of Quality, Quality Planning, Quality costs - Analysis Techniques for Quality Costs, Basic concepts of Total Quality Management, Historical Review, Principles of TQM, Leadership - Concepts, Role of Senior Management, Quality Council, Quality Statements, Strategic Planning, Deming Philosophy, Barriers to TQM Implementation.

UNIT II: TQM PRINCIPLES

(9)

Customer satisfaction - Customer Perception of Quality, Customer Complaints, Service Quality, Customer Retention, Employee Involvement - Motivation, Empowerment, Teams, Recognition and Reward, Performance Appraisal, Benefits, Continuous Process Improvement - Juran Trilogy, PDCA Cycle, 5S, Kaizen, Supplier Partnership - Partnering, sourcing, Supplier Selection, Supplier Rating, Relationship Development, Performance Measures - Basic Concepts, Strategy, Performance Measure.

UNIT III: STATISTICAL PROCESS CONTROL (SPC)

(9)

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.

UNIT IV: TQM TOOLS

(9)

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.

UNIT V: QUALITY SYSTEMS

(9)

Need for ISO 9000 and Other Quality Systems, ISO 9000:2000 Quality System - Elements, Implementation of Quality System, Documentation, Quality Auditing, TS 16949, ISO 14000 - Concept, Requirements and Benefits.

TOTAL: 45 PERIODDS

TEXT BOOK:

1. Dale H.Besterfield, et al., Total Quality Management, Pearson Education, Inc. 2011. ISBN 81-297-0260-6.

REFERENCE BOOKS:

1. James R.Evans & William M.Lindsay, The Management and Control of Quality, (5th Edition), South-Western (Thomson Learning), 2002 (ISBN 0-324-06680-5).
2. Feigenbaum.A.V. "Total Quality Management, McGraw Hill, 1991.
3. Oakland.J.S. "Total Quality Management Butterworth - Heinemann Ltd., Oxford. 1989.
4. Narayana V. and Sreenivasan, N.S. Quality Management - Concepts and Tasks, New Age International 1996.
5. Zeiri. "Total Quality Management for Engineers Wood Head Publishers, 1991.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x		x			x			x		x	
2	x	x				x			x	x	x	
3	x	x	x			x			x	x		
4	x	x		x	x				x	x		
5							x	x			x	x



ELECTIVES-2

13CSX05 HIGH PERFORMANCE NETWORKS

L	T	P	C
3	0	0	3

OBJECTIVES:

- To have a thorough understanding of the various Packet Switched Networks.
- To learn the overview of circuit switched networks
- To understand in detail about the concepts of ATM and Frame relay.
- To discuss in detail about the Optical networks, Wi-MAX and UWB.

COURSE OUTCOMES:

At the end of the course, the students will be able to

- CO1 : Students will have a strong foundation of OSI model and various protocols used in each layer
- CO2 : Be familiar with ATM networks and its layers.
- CO3 : Able to analyze various memory hierarchies both internal and external.
- CO4 : Students will have a thorough knowledge in Wi-MAX and UWB.
- CO5 : Analyze various protocols used in Bluetooth technology .

UNIT I: PACKET SWITCHED NETWORKS (9)

OSI and IP models – Ethernet (IEEE 802.3) – Token ring (IEEE 802.5) –FDDI – DQDB – SMDS: Internetworking with SMDS. Wireless LAN (IEEE 802.11).

UNIT II: CIRCUIT SWITCHED NETWORKS (9)

SONET - Dense Wave Division Multiplexing (DWDM) – Digital Subscriber Line (DSL) – Intelligent Network Architecture- CATV.

UNIT III: ATM NETWORKS (9)

ATM: Main Features of ATM– Addressing, Signaling and Routing– ATM Header Structure– Adaptation Layer– Management and control– Internetworking with ATM.

UNIT IV: OPTICAL NETWORKS (9)

Optical Links - WDM Systems – Optical Cross Connects - Optical LANs. Optical Paths and Networks- Ring Networks – Hierarchical Mesh Networks – Optical Networks.

UNIT V: ULTRA WIDEBAND (UWB) AND WIMAX (9)

UWB: Introduction– Time-Hopping Ultra wide band– Direct Sequence Ultra wideband– Multiband– Other Types of UWB.

WiMAX: Introduction– WiMAX Overview– Competing Technologies– Overview of the Physical Layer– PMP Mode– Mesh Mode– Multi hop Relay Mode.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Walrand .J. Varatya, “High performance communication network”, Morgan Kauffman – Harcourt Asia Pvt.Ltd. 2nd Edition, 2000.
2. David tung chong wong, Peng-yong kong, Ying-chang liang, Kee chaing chua and Jon W. Mark, “Wireless Broadband Networks,” John Wiley & Sons, 2009.

REFERENCE BOOKS:

1. William Stallings,"ISDN and Broadband ISDN with Frame Relay and ATM", 4th edition, Pearson education Asia, 2002
2. Jennifer Bray and Charles F.Sturman,"Blue Tooth" Pearson education Asia, 2001 Shahin Farahani, "ZigBee Wireless Networks and Transceivers", Elsevier Ltd,2008.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x						x	x		x	x
2	x	x						x	x			x
3	x	x	x		x	x		x	x			x
4	x	x	x		x	x		x	x	x	x	x
5	x		x		x			x	x	x	x	x



13CSX06 TCP/IP DESIGN AND IMPLEMENTATION

L	T	P	C
3	0	0	3

OBJECTIVES:

- To understand the design of internetworking, IP and TCP
- To Interpret TCP/IP application services
- Understand the fundamentals of network design and implementation.
- Learn to design and implement network applications.

COURSE OUTCOMES:

At the end of the course, the students will be able to

- CO1 : To gain practical experience in designing communication protocols
- CO2 : To outline the various ways of connecting a network
- CO3 : To gain practical experience of IP addresses, and the fundamentals of IP routing
- CO4 : To build the trade-offs between UDP and TCP and its uses.
- CO5 : To get an insight of congestion avoidance and control.

UNIT I : INTRODUCTION

(9)

Internetworking concepts and architecture model – classful Internet address – CIDR – Subnetting and Supernetting – ARP – RARP- IP- IP Routing – ICMP – IPv6.

UNIT II : TCP

(9)

Services – header – connection establishment and termination – interactive data flow – bulk data flow – timeout and retransmission – persist timer – keep alive timer.

UNIT III : IP IMPLEMENTATION

(9)

IP global software organization –routing table–routing algorithms – fragmentation and reassembly – error processing (ICMP) – Multicast Processing (IGMP).

UNIT IV : TCP IMPLEMENTATION I

(9)

Data structure and input processing – transmission control blocks – segment format – comparison–finite state machine implementation – Output processing – mutual exclusion –the computing the TCP Data length.

UNIT V : TCP IMPLEMENTATION II

(9)

Timers – events and messages – timer process – deleting and inserting timer event – flow control and adaptive retransmission– congestion avoidance and control – urgent data processing and push function.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Douglas E Comer, “Internetworking with TCP/IP Principles, Protocols and Architecture”, Vol V edition 2006.
2. Douglas E Comer, “Internetworking with TCP/IP Vol. II: ANSI C Version: Design, Implementation, and Internals:2”, III Edition, 1999

REFERENCE BOOKS:

1. W.Richard Stevens “TCP/IP Illustrated” Vol 1. Pearson Education, 2012.
2. W.Richard Stevens “TCP/IP Illustrated” Volume 2, Pearson Education 2003.
3. Forouzan, “TCP/IP Protocol Suite” Second Edition, Tata MC Graw Hill, 2003.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x									x
2	x	x	x		x				x			x
3	x	x	x		x	x	x		x			x
4	x											x
5	x		x		x	x	x		x			x



Approved by Fourth Academic council

13CSX07 DISTRIBUTED COMPUTING

L	T	P	C
3	0	0	3

OBJECTIVES:

- To study the core ideas behind modern coordination and communication paradigms and distributed data structures
- To realize not only the basic principles but also the best practice engineering techniques of concurrent and distributed computing
- To present the techniques to formally study the safety and progress properties of concurrent and distributed algorithms
- To analyze the performance of synchronization in distributed systems
- To handle transactions and deadlocks in distributed systems in engineering applications

COURSE OUTCOMES:

At the end of the course, the students will be able to

- CO1 : Understand the differences among: concurrent, networked, distributed, and mobile systems.
- CO2 : Use communication between distributed objects by Remote procedure calls in real time applications.
- CO3 : Design distributed systems based on security, file systems architecture in distributed operating system.
- CO4 : Understand the event synchronization and distributed mutual exclusion problems.
- CO5 : Apply transactions and deadlock handling techniques in distributed systems in engineering applications.

UNIT I: BASIC CONCEPTS

(9)

Characterization of Distributed Systems – Examples – Resource Sharing and the Web – Challenges – System Models – Architectural and Fundamental Models – Networking and Internetworking – Types of Networks – Network Principles – Internet Protocols – Case Studies

UNIT II: PROCESSES AND DISTRIBUTED OBJECTS

(9)

Inter-process Communication – The API for the Internet Protocols – External Data Representation and Marshalling – Client –Server Communication – Group Communication – Case Study – Distributed Objects and Remote Invocation – Communication Between Distributed Objects – Remote Procedure Call – Events and Notifications – Java RMI

UNIT III: OPERATING SYSTEM ISSUES I

(9)

The OS Layer – Protection – Processes and Threads – Communication and Invocation – OS Architecture – Security – Overview – Cryptographic Algorithms – Digital Signatures – Cryptography Pragmatics – Case Studies – Distributed File Systems – File Service Architecture – Sun Network File System – The Andrew File System

UNIT IV: OPERATING SYSTEM ISSUES II

(9)

Name Services – Domain Name System – Directory and Discovery Services – Global Name Service – X.500 Directory Service – Clocks – Events and Process States – Synchronizing Physical Clocks – Logical Time And Logical Clocks – Global States – Distributed Debugging – Distributed Mutual Exclusion – Elections – Multicast Communication Related Problems

UNIT V: DISTRIBUTED TRANSACTION PROCESSING**(9)**

Transactions – Nested Transactions – Locks – Optimistic Concurrency Control – Timestamp Ordering – Comparison – Flat and Nested Distributed Transactions – Atomic Commit Protocols – Concurrency Control in Distributed Transactions – Distributed Deadlocks – Transaction Recovery – Overview of Replication And Distributed Multimedia Systems

TOTAL: 45 PERIODS**TEXT BOOKS:**

1. George Coulouris, Jean Dollimore and Tim Kindberg, “Distributed Systems Concepts and Design”, 3rd Edition, Pearson Education, 2002.
2. Andrew S. Tanenbaum, Maarten van Steen, Distributed Systems, “Principles and Paradigms”, Pearson Education, 2002.

REFERENCE BOOKS:

1. Sape Mullender, “Distributed Systems”, 2nd Edition, Addison Wesley, 1993.
2. Albert Fleishman, Distributed Systems, “Software Design and Implementation”, Springer, Verlag, 1994.
3. M. L. Liu, “Distributed Computing Principles and Applications”, Pearson Education, 2004.
4. Mugesh Singhal, Niranjana G Shivaratri, “Advanced Concepts in Operating Systems”, Tata McGraw Hill Edition, 2001.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x								x
2	x	x	x	x	x							x
3	x	x	x	x	x							x
4	x	x	x	x	x							x
5	x	x	x	x	x							x



13CSX08 NETWORK ANALYSIS AND MANAGEMENT

L	T	P	C
3	0	0	3

OBJECTIVES:

- To understand and learn the network analysis and flow analysis with a network tool.
- To evaluate the performance of the design issues and architecture to meet the network communication requirements.
- To understand the network management technology to manage the real world entity.

COURSE OUTCOMES:

At the end of the course, the students will be able to

- CO1 : Analyze the issues and challenges pertaining to management of emerging network technologies in the networks and use SNMP for managing the network.
- CO2 : Use RMON for monitoring the behaviour of the network
- CO3 : Apply a range of techniques for characterizing network structure.
- CO4 : Apply network management techniques
- CO5 : Demonstrate knowledge of recent research in the area and exhibit technical writing and presentation skills.

UNIT I : INRODUCTION (9)

Network Topology, LAN, Network node components- Hubs, Bridges, Routers, Gateways, Switches, WAN, ISDN Transmission Technology, Communications protocols and standards. Network Management: Network management systems – SNMP, Future of Network.

UNIT II: FLOW ANALYSIS (9)

Background- Flows- Data sources and sinks- Flow models- Flow boundaries- Flow distributions- Flow specifications- Identifying and Developing flows–examples of applying flow specific.

UNIT III: NETWORK MANAGEMENT ARCHITECTURE (9)

Defining network management- Network management mechanisms-Architectural considerations- Performance Architecture-Developing goals for performance- Performance mechanism-Architectural considerations.

UNIT IV: NETWORK MANAGEMENT DESIGN (9)

Design concepts-Design process, Vendor, Equipment and Service-Provider evaluation, Network layout, Design traceability, and Design metrics.

UNIT V: MANAGEMENT INTEGERATION (9)

Network and System management, Network management system platform; Current SNMP Broadband and TMN management, Network management standards. SNMPV1, SNMPV2 system architecture, SNMPV2, structure of management information. SNMPV2 – MIB – SNMPV2 protocol, SNMPV3- Architecture, Application, – Remote monitoring – RMON SMI and MIB, user based security model, access control RMON.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. James D.McCabe, Network Analysis, Architecture and Design, 3rd Edition, Elsevier, 2007.
2. Behrouz A Forouzan, Data Communications and Networking, 4th Edition, McGraw-Hill companies.
3. Alexander Clemm, Network Management Fundamentals, 1st Edition, Cisco Press, 2006.

REFERENCE BOOKS:

1. Larry Walsh, SNMP MIB Handbook, 2008.
2. Laura Chappell and Gerald Combs, Wireshark Network Analysis, 1st Edition, 2010.
3. William Stallings, SNMP, SNMPV2, SNMPV3, AND RMON 1&2, 3rd Edition, 1999.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x				x						x
2	x			x								x
3	x		x			x						x
4	x	x	x		x	x						x
5	x	x	x		x		x	x				x



13CSX09 WIRELESS COMMUNICATION AND NETWORKS

L	T	P	C
3	0	0	3

OBJECTIVES:

- To introduce the concepts of wireless medium.
- To make the students know about wireless medium access.
- To understand the wireless network operation.
- To enhance the understanding on network generations.

COURSE OUTCOMES:

At the end of the course, the students will be able to

- CO1 : Learn the terms used in wireless communication.
- CO2 : Derive the right of entry about wireless medium.
- CO3 : Design wireless network with the concept of cell and mobility.
- CO4 : Apply various wireless IEEE standards to the real world network entity.
- CO5 : Compare the generations for network communication.

UNIT I: WIRELESS MEDIUM

(9)

Air Interface Design – Radio propagation mechanism – Path loss modeling and Signal Coverage– Effect of Multipath and Doppler – Channel Measurement and Modeling – Simulation of Radio Channel.

UNIT II: WIRELESS MEDIUM ACCESS

(9)

Fixed Assignment Access for Voice Networks – Random Access for Data Networks –Integration of Voice and Data Traffic.

UNIT III: WIRELESS NETWORK OPERATION

(9)

Wireless Network Topologies – Cellular Topology – Cell fundamentals – Signal to Interference Ratio – Capacity Expansion – Mobility Management – Resources and Power Management –Security in Wireless Networks.

UNIT IV: WIRELESS WAN

(9)

GSM and TDMA Technology – Mobile Environment – Communication in the Infrastructure –CDMA Technology – IS95 – IMT2000 – Mobile Data Networks – CDPD Networks – GPRS –Mobile Application Protocol.

UNIT V: WIRELESS LANS AND HIPERLANS

(9)

Introduction to wireless LANs – IEEE 802.11 – WPAN IEEE 802.15 – Wireless Home Networking – Wireless Geolocation – Introduction to 1G and 2G– 3G Overview: Migration path to UMTS and 3GPP– UMTS Services–3GPP Network Architecture overview– 4G– convergent devices.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Kaveth Pahlavan, K.Prasanth Krishnamurthy, “Principles of Wireless Networks”, Pearson Education Asia, 2002.
2. Clint Smith. P.E., and Daniel Collins, “3G Wireless Networks”, 2nd Edition, Tata McGraw Hill, 2007.

REFERENCE BOOKS:

1. Andrea Goldsmith, "Wireless Communications", Cambridge University Press, 2007.
2. William Stallings, "Wireless Communications and networks", Pearson/Prentice Hall of India, 2nd Ed., 2007.
3. T.S.Rappaport, "Wireless Communications: Principles & Practice", Second Edition, Prentice Hall of India, 2002.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x									x	x
2	x	x	x	x	x							x
3	x	x	x	x								x
4	x	x	x	x	x	x		x				x
5	x	x	x	x	x	x	x	x				x



SEMESTER VII

13GEC07 ENGINEERING ECONOMICS AND FINANCIAL ACCOUNTING

L	T	P	C
3	0	0	3

OBJECTIVES:

- To manage an Organization; to describe principles of macroeconomics to have the understanding of economic environment of Business.
- To acquire a reasonable knowledge in Accounts.
- To analyse and evaluate Financial Statements.

COURSE OUTCOMES:

At the end of the course, the students will be able to

- CO1 : Know the importance of Engineering Economics and Principles of Micro and Macro Economics.
- CO2 : Estimate the Market Position with the Knowledge in Demand Forecasting and Supply.
- CO3 : Develop and Estimate Cost for any Project.
- CO4 : Fix the Price of the Product with the Knowledge in different Market Structure.
- CO5 : Analyze the Financial Statement to determine the optimal Managerial Decisions.

UNIT - I INTRODUCTION (5)

Managerial Economics – Relationship with other disciplines, Firms – Types, Objectives and Goals, Managerial Decisions, Decision Analysis.

UNIT - II DEMAND AND SUPPLY ANALYSIS (10)

Demand – Types of Demand, Determinants of Demand, Demand Function, Demand Elasticity, Demand Forecasting. Supply – Determinants of Supply, Supply Function, Supply Elasticity.

UNIT - III PRODUCTION AND COST ANALYSIS (10)

Production Function – Returns to scale, Production Optimization, Isoquants, and Managerial uses of Production Function. Cost Concepts – Cost Function, Determinants of Cost, Estimation of Cost.

UNIT - IV PRICING (10)

Determinants of Price, Pricing under different Objectives and different Market Structures, Price Discrimination, Pricing methods in practice.

UNIT - V FINANCIAL ACCOUNTING AND CAPITAL BUDGETING (10)

Introduction to Financial, Cost and Management Accounting, Accounting Concepts and Conventions, Final Accounts, Investments – Evaluation of Investment Decision – Average Rate of Return, Payback Period, Net Present Value.

TOTAL = 45 PERIODS

TEXT BOOKS:

1. Anjali Bagad, “Engineering Economics and Financial Accounting”, Technical Publications 2nd Revised Edition, 2011.
2. B. Senthil Arasu, J. Praveen Paul, “Engineering Economics and Financial Accounting”, SchiTech Publication (India) Pvt. Ltd.

REFERENCES:

1. McGuigan, Moyer and Harris, "Managerial Economics; Applications, Strategy and Tactics", Thomson South Western, 10th Edition, 2005.
2. Paresh Shah, "Basic Financial Accounting for Management", Oxford University Press, New Delhi, 2007.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x							x				
2	x	x	x	x					x	x		x
3		x		x					x	x	x	x
4	x	x		x			x			x		x
5		x		x						x	x	



13CS701 PRINCIPLES OF CLOUD COMPUTING

L	T	P	C
3	0	0	3

OBJECTIVES:

- To understand the basic concepts of the cloud.
- To understand the architecture and virtualization of cloud.
- To describe the key elements of Cloud Platform and Thread Programming.
- To understand the concepts of Map Reduce Programming.
- To design intelligent Cloud services and Applications.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Recall and describe Cloud Platform and Technology.

CO2 : Describe and Implement Virtualization Technologies.

CO3 : Develop and manage Cloud Applications using Aneka.

CO4 : Create a Hadoop Environment and Generate a Map- Reduce Programming.

CO5 : Design a Web Based Applications of various Corporate.

UNIT I INTRODUCTION

(9)

Introduction: Cloud computing at a Glance – Historical Development – Building Cloud Computing Environments – Computing Platform and Technologies – Principles of Parallel and Distributed Computing: Elements of parallel Computing – Distributed Computing –Technologies of Distributed Computing.

UNIT II VIRTUALIZATION AND CLOUD COMPUTING ARCHITECTURE

(9)

Virtualization: Introduction – Characteristics of Virtualized Environments – Taxonomy of Virtualization Techniques – Virtualization and Cloud Computing – Pros and Cons of Virtualization – Technology Examples – Cloud Computing Architecture: Cloud reference model – Types of the Clouds – Open Challenges.

UNIT III PROGRAMMING ENTERPRISE CLOUDS USING ANEKA

(9)

Aneka: Cloud Application Platform – Anatomy of the Aneka Container – Building Aneka Clouds – Cloud Programming and Management – Concurrent Computing: Thread Programming – Programming Applications with Threads – Multi Threading and Programming applications with Aneka Threads.

UNIT IV HIGH THROUGHPUT COMPUTING AND MAP REDUCE PROGRAMMING

(9)

High Throughput Computing: Task Programming – Task Computing – Task Based Application Models – Aneka Task-Based Programming – Data Intensive Computing: Map-Reduce Programming – Data Intensive Computing – Technologies for Data-Intensive Computing – Aneka Map-Reduce Programming.

UNIT V CLOUD PLATFORMS AND APPLICATIONS

(9)

Cloud Platforms in Industry: Amazon Web Services – Google AppEngine – Microsoft Azure – Cloud Application: Scientific Applications – Business and consumer Applications – Case Study – Cloud Deployment Tools: Eucalyptus, open Nebula.

TOTAL = 45 PERIODS

TEXT BOOK:

1. Rajkumar Buyya, Christian Vecchiola and Thamari Selvi S, “Mastering in Cloud Computing”, McGraw Hill Education (India) Private Limited, 2013.

REFERENCES:

1. Anthony T Velte, “Cloud Computing: A practical Approach”, Tata McGraw Hill, 2009.
2. Halper Fern, Kaufman Marcia, Bloor Robin, Hurwit Judith, “Cloud Computing for Dummies”, Wiley India, 2009.
3. Rajkumar Buyya, James Broberg, Andrzej M. Goscinski, “Cloud Computing Principles Books and Paradigms”, Wiley, 2014.
4. Michael Miller , “Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online”, Que Publishing ,2009
5. Dr. Kumar Saurabh, “Cloud Computing – Unleashing Next Gen Infrastructure to Application”, Willey, 2014.

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Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x				x			x			x	x
2	x	x		x	x	x					x	x
3	x	x	x	x	x		x		x		x	x
4	x	x	x	x	x	x	x		x		x	x
5	x	x	x	x	x	x	x	x	x		x	x



13CS702 C# AND .NET FRAMEWORK

L	T	P	C
3	0	0	3

OBJECTIVES:

- To impart the fundamental concepts of C# and .NET.
- To know the object oriented aspects of C#.
- To learn about Application development in .NET.
- To learn about the database connectivity for applications with ADO.NET.
- To know the working of distributed applications.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Implement the basic and advanced features of C# and .NET.

CO2 : Understand the object oriented aspects of C#.

CO3 : Develop windows applications using .NET.

CO4 : Design web based applications using .NET.

CO5 : Comprehend CLR and the .Net framework.

UNIT - I BASICS OF C# and .NET

(9)

Introducing C# – Understanding .NET – Overview of C# – Literals – Variables – Data Types – Operators – Expressions – Control statements – Methods – Arrays – Strings – Structures – Enumerations.

UNIT - II OBJECT ORIENTED ASPECTS OF C#

(9)

Classes – Objects – Inheritance – Properties – Indexers – Polymorphism – Interfaces – Operator Overloading – Delegates – Events – Collections – Errors and Exceptions.

UNIT - III APPLICATION DEVELOPMENT ON .NET

(9)

Building Windows Applications – Windows Form Controls – Common Dialog Box – Creating User Controls – Components – ADO.NET Architecture – Accessing Data with ADO.Net – Storage and Retrieval of BLOB Objects – Crystal Report.

UNIT - IV WEB BASED APPLICATION DEVELOPMENT ON .NET

(9)

Programming Web Applications With Web Forms – Web Controls and Properties – Cascading Style Sheet – Web User Controls – Data Bound Controls – Programming Web Services – Introduction to Windows Communication Foundation Services.

UNIT - V CLR AND THE .NET FRAMEWORK

(9)

Assemblies – Versioning – Attributes – Reflection – Viewing Meta Data – Type Discovery – Reflection on Type – Marshalling – Remoting – Garbage Collection – Security in .NET.

TOTAL = 45 PERIODS

TEXT BOOKS:

1. Herbert Schildt, “The Complete Reference: C# 4.0”, Tata Mc Graw Hill, 2012.
2. Christian Nagel et al. “Professional C# 2012 with .NET 4.5”, Wiley India, 2012.

REFERENCES:

1. Andrew Troelsen , “Pro C# 2010 and the .NET 4 Platform, Fifth edition, A Press, 2010.
2. Ian Griffiths, Matthew Adams, Jesse Liberty, “Programming C# 4.0”, Sixth Edition, O’Reilly, 2010.
3. E. Balagurusamy, “Programming in C# - A Primer”, Third Edition, Tata McGraw-Hill, 2010.

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Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x	x						x	x
2				x	x						x	x
3	x	x	x	x	x						x	x
4	x	x	x		x						x	x
5	x	x	x	x	x						x	x



Approved by Fourth Academic council

13CS711 CLOUD LABORATORY

L	T	P	C
3	0	0	2

OBJECTIVES:

- To be exposed to tool kits of cloud environment.
- Learn to run virtual machines of different configuration.
- Learn to use Hadoop.
- Apply Map-Reduce concept to applications.
- To build Private Cloud.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Use the cloud tool kit.

CO2 : Design and Implement applications on the Cloud.

CO3 : Create virtual machines from available physical resources.

CO4 : Implement Map-Reduce concept.

CO5 : Setup a private cloud.

Use Open Nebula to set up the cloud and demonstrate.

1. Find procedure to run the virtual machine of different configuration. Check how many virtual machines can be utilized at particular time.
2. Find procedure to attach virtual block to the virtual machine and check whether it holds the data even after the release of the virtual machine.
3. Install a C compiler in the virtual machine and execute a sample program.
4. Show the virtual machine migration based on the certain condition from one node to the other.
5. Find procedure to install storage controller and interact with it.
6. Find procedure to set up the one node Hadoop cluster.
7. Mount the one node Hadoop cluster using FUSE.
8. Write a program to use the API's of Hadoop to interact with it.
9. Write a wordcount program to demonstrate the use of Map and Reduce tasks
10. Setup a Private Cloud Using Open Nebula. Develop a simple application and make it available to the intended user

TOTAL = 45 PERIODS

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x	x		x	x	x		x	
2	x	x	x				x	x	x		x	
3	x	x	x		x		x	x	x		x	
4	x	x	x		x			x			x	x
5	x	x	x		x		x	x	x		x	x



13CS712 C# & .NET FRAMEWORK LABORATORY

L	T	P	C
0	0	3	2

OBJECTIVES:

- To Understand the basics and object oriented aspects of C#
- To Understand the .Net Framework Architecture
- To Learn about Application development in .NET
- To Learn about the database connectivity for applications with ADO.NET
- To Learn to develop ASP.NET web services

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Develop simple C# programs using basic programming constructs.

CO2 : Gain knowledge about the object oriented aspects of C#.

CO3 : Design simple applications using .NET.

CO4 : Implement the database connectivity with ADO.NET.

CO5 : Design web services.

LIST OF EXPERIMENTS:

1. C# program using Branching and Looping statements.
2. C# program using Arrays and Strings.
3. C# program using Structures and Enumerations
4. C# program using Inheritance.
5. C# program using Polymorphism.
6. C# program using Interfaces.
7. C# program using Delegates, Events, Errors and Exceptions.
8. C# program using Multi module Assembly.
9. Developing Windows Application using C#.
10. Developing Application using ADO.NET that illustrates the use of Datareader, DataAdapter, Data Row.
11. Developing ASP.NET application using web controls
12. Creating Simple Web Service using ASP.NET.

TOTAL = 45 PERIODS

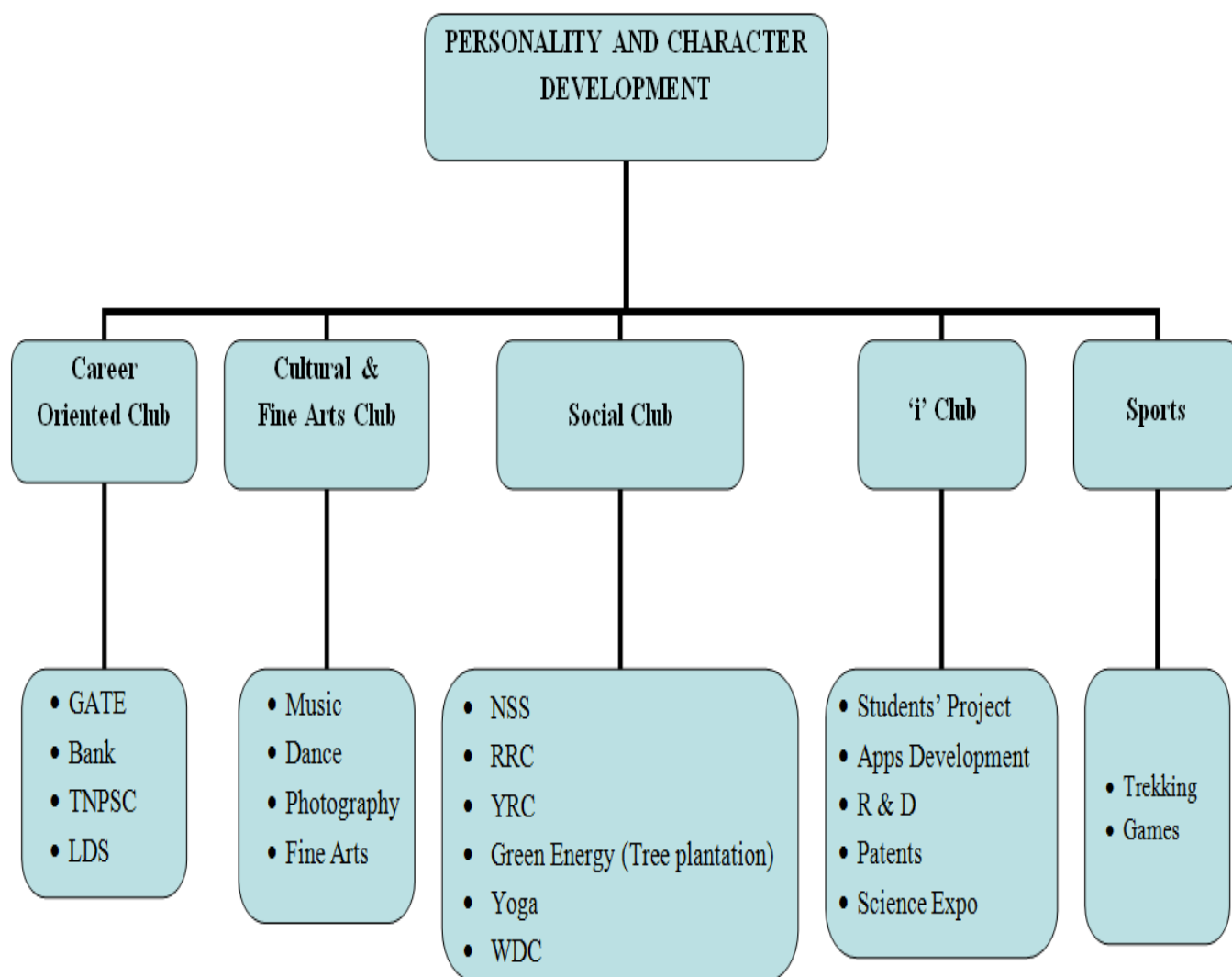
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COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x	x						x	x
2	x			x	x						x	x
3	x	x	x	x	x						x	x
4	x	x	x		x						x	x
5	x	x	x	x	x						x	x



13GE711 PERSONALITY AND CHARACTER DEVELOPMENT

L T P C
0 0 1 0



***LDS - Leadership Development Skills**

OBJECTIVES :				
Career Oriented Club	Cultural & Fine Arts Club	Social Club	'i' club	Sports
<ul style="list-style-type: none"> •To provide support for identifying specific career field of interests and career path •To provide support for preparing for competitive exams 	<ul style="list-style-type: none"> •To bring out the hidden talent of students in music, dance and other fine arts. •To promote photography skill among the students •To develop and enhance the performance of students by participating in various events •To inculcate managerial capabilities such as event management and stage organization 	<ul style="list-style-type: none"> •To create social awareness and develop a sense of social and civic responsibility •To inculcate socially and environmentally sound practices and be aware of the benefits •To encourage the students to work along with the people in rural areas, thereby developing their character, social consciousness, commitment, and discipline and being helpful towards the community. 	<ul style="list-style-type: none"> •To inculcate the basic concepts of innovation •To foster the networking between students, build teams, exchange ideas, do projects and discuss entrepreneurial opportunities •To enrich the academic experience, build competencies and relationships beyond the classroom 	<ul style="list-style-type: none"> •To provide opportunities to excel at sports •To promote an understanding of physical and mental well-being through an appreciation of stress, rest and relaxation. •To develop an ability to observe, analyze and judge the performance of self and peers in sporting activities. •To develop leadership skills and nurture the team building qualities. <p><u>Trekking:</u></p> <ul style="list-style-type: none"> •To provide opportunities to explore nature and educating about the purity of nature •To improve physical and mental health.

OUTCOMES : At the end of this course, the students will be able to				
<ul style="list-style-type: none"> •Find a better career of their interest. •Make use of their knowledge during competitive exams and interviews. 	<ul style="list-style-type: none"> •Take part in various events •Develop team spirit, leadership and managerial qualities 	<ul style="list-style-type: none"> •Develop socially responsive qualities by applying acquired knowledge •Build character, social consciousness, commitment and discipline 	<ul style="list-style-type: none"> •Apply the acquired knowledge in creating better solutions that meet new requirements and market needs •Develop skills on transforming new knowledge or new technology into viable products and services on commercial markets as a team 	<ul style="list-style-type: none"> •Demonstrate positive leadership skills that contribute to the organizational effectiveness •Take part an active role in their personal wellness (emotional, physical, and spiritual) that supports a healthy lifestyle •Create inclination towards outdoor activity like nature study and Adventure.

TOTAL [4 x (P:15)]: 60 PERIODS

(Cumulatively for Four Semesters)



Approved by Fourth Academic council

13CSX10 MOBILE APPLICATION DEVELOPMENT

L	T	P	C
3	0	0	3

OBJECTIVES:

- To understand system requirements for mobile applications.
- To learn suitable design using specific mobile development frameworks.
- To create mobile application design.
- To understand the design using specific mobile development frameworks.
- To know the latest technologies available in mobile application.

COURSE OUTCOMES:

At the end of the course, the students will be able to

- CO1 : Describe the requirements for mobile applications.
- CO2 : Explain the challenges in mobile application design and development.
- CO3 : Develop design for mobile applications for specific requirements.
- CO4 : Implement the design using Android SDK and using Objective C and iOS.
- CO5 : Deploy mobile applications in Android and iPhone.

UNIT - I INTRODUCTION

(9)

Introduction to mobile applications – Importance of mobile strategies – Cost of development – Mobile myths – Market and business drivers for mobile applications – Mobile web presence e-Mobile applications – Benefits of a mobile app.

UNIT - II BASIC DESIGN

(9)

Introduction – Mobile user interface design – Understanding mobile application users – Understanding mobile information design – Understanding mobile platforms – Using the tools of mobile interface design.

UNIT- III ADVANCED DESIGN

(9)

Choosing a mobile web option – Adaptive mobile websites – Dedicated mobile websites – Mobile web apps with HTML5 – Design patterns for mobile applications – Advanced web service techniques for mobile devices.

UNIT - IV DEVELOPMENT ENVIRONMENT

(9)

Android development practices – Android fundamentals – Android SDK – Common interactions – Offline storage – iOS SDK – Debugging iOS apps – Objective – C basics – iOS features.

UNIT - V TECHNOLOGY

(9)

Using google maps – GPS – WiFi and WiMAX – Integration with social media applications – Foldable displays – Centralized storage – Mobile commerce.

TOTAL = 45 PERIODS

TEXT BOOK:

1. Jeff McWherter and Scott Gowell, "Professional Mobile Application Development", Wrox, 2012.

REFERENCES:

1. Charlie Collins, Michael Galpin and Matthias Kappler, "Android in Practice", DreamTech, 2012.
2. James Dovey and Ash Furrow, "Beginning Objective C", Apress, 2012.
3. David Mark, Jack Nutting, Jeff LaMarche and Frederic Olsson, "Beginning iOS6 Development: Exploring the iOS SDK", Apress, 2013.
4. <http://developer.android.com/develop/index.html>.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x		x		x							x
2			x	x							x	
3		x	x		x							x
4	x	x	x		x							x
5	x			x					x		x	x



13CSX11 HUMAN COMPUTER INTERACTION

L	T	P	C
3	0	0	3

OBJECTIVES:

- To understand fundamentals of human computer interaction.
- To design various models for interaction.
- To Learn design techniques and fundamentals of Human Computer Interaction.
- To know various types of existing interfaces and evaluation techniques.
- To understand applications of HCI in emerging trends.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Understand the requirements and specifications for the interaction design.

CO2 : Analyze the evaluation techniques of human interaction.

CO3 : Determine the most appropriate HCI methods to meet the needs of a practical software development Project.

CO4 : Identify, analyzes, formulate and solve engineering problems.

CO5 : Understand the impact of engineering solutions in a global, economic, environmental, and societal context.

UNIT- I INTRODUCTION:THE HUMAN AND COMPUTER (9)

The Human: Introduction – Input – output Channels – Human memory – Thinking: reasoning and problem – solving – Individual differences – Psychology and the design of interactive systems –The computer: Introduction – Text entry devices – Positioning – pointing and drawing – Paper: printing and scanning – Memory – Processing and networks.

UNIT - II INTERACTION AND INTERFACES (9)

The Interaction: Introduction – Models of interaction – Frameworks and HCI – Ergonomics – Interaction styles – Elements of the WIMP interface – Interactivity –The context of the interaction – Experience – Engagement and fun – Paradigms: Introduction – Paradigm for interaction – Expressive interfaces – models of emotions – interface types.

UNIT - III DESIGNING RULES (9)

Interaction design basics: Introduction –The process of design – User focus–Scenarios – Navigation design – Screen design and layout – Iteration and Prototyping – HCI in the software process: Introduction – The software life cycle – Usability engineering – Iterative design and prototyping – Design rationale – Design rules: Introduction – Principles to support usability – Standards – Guidelines – Golden rules and heuristics –HCI patterns.

UNIT - IV MODELS AND EVALUATION FRAMEWORK (9)

Cognitive models: Introduction – Goal and task hierarchies – Linguistic models – The challenge of display – based systems – Physical and device models – cognitive architecture – Communication and collaboration model: Introduction – Face-to-face communication – Conversation – Text-based communication – Group working –Models of the system: Introduction – Standard Formalism – Interactive models – Continuous behavior.

UNIT - V INTERFACING APPLICATIONS (9)

Groupware: Introduction – Groupware systems – Computer – mediated communication – Meeting and decision support systems – Shared applications and artifacts – Frameworks for groupware – Implementing synchronous groupware – Hypertext – multimedia and the World Wide Web: Introduction – Understanding hypertext – Finding things – Web technology and issues – Static web content – Dynamic web content.

TOTAL = 45 PERIODS

TEXT BOOK:

1. Alan Dix, Janet Finlay, Gregory D. Abowd and Russell Beale, "Human-Computer Interaction", Prentice Hall, Third edition, 2009.

REFERENCES:

1. J. Preece, Y. Rogers, H. Sharp, D. Benyon, S. Holland and T. Carey, "Human-Computer Interaction", Addison Wesley, 1994.
2. Andrew Sears, Julie A. Jacko, "The Human-Computer Interaction Handbook Fundamentals, Evolving Technologies and Emerging Applications", Second Edition, Taylor & Francis Group, 2008.
3. Claude Ghaoui, "Encyclopaedia of Human Computer Interaction", Wiley, 2000.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x		x	x	x			x	x	x		x
2	x	x		x	x				x	x		x
3			x		x			x			x	x
4					x			x		x		x
5			x	x	x		x				x	x



13CSX12 GREEN COMPUTING

L	T	P	C
3	0	0	3

OBJECTIVES:

- To acquire knowledge to adopt green computing practices.
- To learn about green environment architecture.
- To minimize energy consumption.
- To understand how to reduce the requirements for the disposal of equipment.
- To manage improved environmental sustainability.

COURSE OUTCOMES:

At the end of the course, the students will be able to

- CO1 : Determine green computing technology to reduce paper wastage and carbon footprint.
- CO2 : Describe behaviour and capabilities of green assets and processes.
- CO3 : Conserve natural resources.
- CO4 : Utilize the resources in a socio economic manner.
- CO5 : Implement the environmental impacts of green activities.

UNIT - I FUNDAMENTALS (9)

Green IT Fundamentals: Business, IT, and the Environment – Green IT Strategies: Drivers, Dimensions, and Goals – Environmentally Responsible Business: Policies, Practices, and Metrics – Green computing: Carbon Foot Print, Scoop on Power.

UNIT - II GREEN ASSETS AND MODELING (9)

Green Assets: Buildings, Data Centers, Networks, and Devices – Green Business Process Management: Modeling, Optimization, and Collaboration – Green Enterprise Architecture, Environmental Intelligence and Green Supply Chains – Green Information Systems: Design and Development Models.

UNIT - III RECYCLING AND TELECOMMUTING (9)

Choosing Your Green PC Path: Buying a Green Computer – Recycling Your Computer – Greener Under the Hood: Optimize Your Computer Power Management – Greening Mobile Devices – Telecommuting, Teleconferencing and Teleporting: Making the Case for Telecommuting – Telecomm Central: The Green Home Office – Collaborating and Cloud Computing.

UNIT - IV GREEN COMPLIANCE (9)

Sociocultural Aspects of Green IT – Green Enterprise Transformation Roadmap – Green Compliance: Protocols, Standards, and Audits – Emergent Carbon Issues: Technologies and Future.

UNIT - V CASE STUDIES (9)

The Environmentally Responsible Business Strategies Research Survey – Case Study Scenarios for Trial Runs – Case Studies in Applying Green IT Strategies and Applications to a Hospital, Packaging Industry and Telecom Sector.

TOTAL = 45 PERIODS

TEXT BOOKS:

1. Bhuvan Unhelkar, “Green IT Strategies and Applications – Using Environmental Intelligence”, CRC Press, June 2011.
2. Woody Leonhard, Katherrine Murray, “Green Home computing for dummies”, August 2009.

REFERENCES:

1. John Lamb, "The Greening of IT", Pearson Education, 2009.
2. Jason Harris, "Green Computing and Green IT- Best Practices on regulations & industry", Lulu.com, 2008.
3. Carl Speshocky, "Empowering Green Initiatives with IT", John Wiley & Sons, 2010.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x		x	x	x	x		x	x	x		x
2	x	x		x	x	x			x	x		x
3			x		x	x		x			x	x
4					x	x		x		x		x
5			x	x	x	x	x				x	x



13ITX12 INFORMATION STORAGE MANAGEMENT

L	T	P	C
3	0	0	3

OBJECTIVE :

- To learn basic concepts of storage concepts.
- To learn about cloud storage
- To learn about security in storage technology.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Understand the concepts of Storage technology.

CO2 : Understand the storage system architecture.

CO3 : Understand network storage concepts.

CO4 : Understand Virtualization.

CO5 : Understand the concepts of information storage on cloud.

UNIT I INTRODUCTION TO STORAGE TECHNOLOGY (9)

Data creation and The value of data to a business, Information Lifecycle, Challenges in data storage and data management, Solutions available for data storage, Core elements of a Data Centre infrastructure, role of each element in supporting business activities.

UNIT II STORAGE SYSTEMS ARCHITECTURE (9)

Hardware and software components of the host environment, Key protocols and concepts used by each component, Physical and logical components of a connectivity environment ,Major physical components of a disk drive and their function, logical constructs of a physical disk, access characteristics, and performance Implications, Concept of RAID and its components, Different RAID levels and their suitability for different application environments: RAID 0, RAID 1, RAID 3, RAID 4, RAID 5, RAID 0+1, RAID 1+0, RAID 6, Integrated and Modular storage systems, high-level architecture and working of an intelligent storage system.

UNIT III INTRODUCTION TO NETWORKED STORAGE (9)

Evolution of networked storage, Architecture, components, and topologies of FC-SAN, NAS, and IP-SAN, Benefits of the different networked storage options, Understand the need for long-term archiving solutions and describe how CAS fulfil the need, Understand the appropriateness of the different networked storage options for different application environments.

UNIT IV Securing Storage and Storage Virtualization (9)

Information Security, Critical security attributes for information systems, Storage security domains, Analyze the common threats in each domain. Storage Virtualization: Forms, Configurations and Challenges. Types of Storage Virtualization: Block-level and File-Level.

UNIT V INFORMATION STORAGE ON CLOUD (9)

Introduction – Cloud computing models – Benefits – Challenges – Storage on cloud – Vocabulary – Applications and Services on Cloud – Architectural Framework – Applications in Cloud computing Architecture – Cloud Security and Integration.

TOTAL: 45 HOURS

TEXT BOOK:

1. Pankaj Sharma, “Information Storage & Management”, S.K Kataria & Sons, 2012.

REFERENCES:

1. G.Somasundaram, Alok Shrivastava, EMC Education Series, “Information Storage and Management”, Wiley, Publishing Inc., 2011.
2. Robert Spalding, “Storage Networks: The Complete Reference”, Tata McGraw Hill, Osborne, 2003.
3. Marc Farley, “Building Storage Networks”, Tata McGraw Hill, Osborne. 2001.
4. Meeta Gupta, “Storage Area Network Fundamentals”, Pearson Education Limited, 2002

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x		x				x	x			x	x
2	x		x				x	x			x	x
3	x		x				x	x			x	x
4	x		x				x	x			x	x
5	x		x				x	x			x	x



13CSX13 KNOWLEDGE MANAGEMENT

L	T	P	C
3	0	0	3

OBJECTIVES:

- To perceive knowledge on the quality of management decision.
- To learn the major challenges and benefits of each phase of the KM cycle.
- To understand the general taxonomic approaches used in classifying knowledge.
- To study the knowledge codification tools and procedures.
- To know the role of internet and data mining in knowledge transfer.

COURSE OUTCOMES:

At the end of the course, the students will be able to

- CO1 : Analyze the technical components and use of decision support systems.
- CO2 : Link the KM frameworks to key KM concepts and the major phases of the KM cycle.
- CO3 : Apply general approaches to classify knowledge.
- CO4 : Apply tools, techniques, processes used for knowledge codification.
- CO5 : Explain the knowledge transfer process.

UNIT - I KNOWLEDGE MANAGEMENT (9)

KM Myths – KM Life Cycle – Understanding Knowledge – Knowledge, Intelligence – Experience – Common Sense – Data, Information, and Knowledge – Types of Knowledge – Expert Knowledge – Human Thinking and Learning.

UNIT - II KNOWLEDGE MANAGEMENT SYSTEM LIFE CYCLE (9)

Challenges in Building KM Systems – KM System Life Cycle – Knowledge Creation and Knowledge Architecture – Nonaka's Model of Knowledge Creation and Transformation – Knowledge Architecture.

UNIT - III CAPTURING KNOWLEDGE (9)

Evaluating the Expert – Developing a Relationship with Experts – Fuzzy Reasoning and the Quality of Knowledge – The Interview as Tool – Guide to a Successful Interview – Knowledge Capturing Techniques, Brain Storming – Protocol Analysis – Consensus Decision making – Delphi Method – Nominal Group Technique – Concept Mapping – Black Boarding.

UNIT - IV KNOWLEDGE CODIFICATION (9)

Modes of Knowledge Conversion – Codification Tools and Procedures – Knowledge Developer's Skill Sets – System Testing and Deployment – Knowledge Testing – Approaches to Logical Testing, User Acceptance Testing – Managing the Testing Phase – User Training – Post Implementation.

UNIT - V KNOWLEDGE TRANSFER AND SHARING (9)

Transfer Methods – Role of the Internet – Knowledge Transfer in E-World – E-Business – KM System Tools – Neural Network – Association Rules – Classification Trees – Data Mining and Business Intelligence – Data Management – Role of Data Mining in Customer Relationship.

TOTAL = 45 PERIODS

TEXT BOOK:

1. Elias. M. Awad & Hassan M. Ghaziri , “Knowledge Management” Pearson Education 2007.

REFERENCES:

1. Guus Schreiber, Hans Akkermans, Anjo Anjewierden, Robert de Hoog, Nigel Shadbolt, Walter Van de Velde and Bob Wielinga, “Knowledge Engineering and Management”, Universities Press, 2001.
2. C.W. Holsapple, “Handbooks on Knowledge Management”, International Handbooks on Information Systems, Vol 1 and 2, 2003.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x		x	x	x	x	x	x	x
2	x	x		x	x							x
3	x	x	x	x	x	x	x	x	x	x	x	x
4	x	x	x	x	x	x	x	x	x	x	x	x
5	x				x						x	x



SEMESTER VIII

13CS831 PROJECT WORK

L **T** **P** **C**
0 **0** **20** **10**

OBJECTIVES:

- To develop the ability to solve a specific problem right from its identification and literature review till the successful solution of the same.
- To enhance the management skills to achieve the project goal by working as a team and also improve technical writing skills.
- To apply the technical skills to provide feasible solutions for real-life problems.

COURSE OUTCOMES:

At the end of the course, the students will be able to

- CO1 : Formulate a problem definition in the field of Computer Science and Engineering through literature survey.
- CO2 : Identify the objectives of the project by thorough understanding of the problem.
- CO3 : Develop methodology using appropriate tools for the problem.
- CO4 : Analyze the problem based on the methodology and tabulate the results.
- CO5 : Conclude the results and submit the project report.

The students in a group of maximum 4 students per batch on a topic approved by the head of the department under the guidance of a faculty member and prepare a comprehensive project report after completing the work to the satisfaction of the supervisor. The progress of the project is evaluated based on a minimum of three reviews. The review committee may be constituted by the Head of the Department. A project report is required at the end of the semester. The project work is evaluated based on oral presentation and the project report jointly by external and internal examiners.

TOTAL: 300 PERIODS

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x	x	x								
2		x	x					x	x	x		
3	x		x				x	x	x			x
4			x						x			x
5			x				x	x	x			x



13CSX14 SOFTWARE DESIGN AND ARCHITECTURE

L	T	P	C
3	0	0	3

OBJECTIVES:

- To understand the fundamentals of software architecture.
- To perceive knowledge on software architecture process.
- To be familiar with architectural models for emerging technologies.
- To gain knowledge about software quality models.
- To learn the software design approaches and conformance.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Explain influence of key architectural structures on business and technical activities.

CO2 : Define software architecture process.

CO3 : Design software architecture model for large scale software systems.

CO4 : Design and understand various software quality models.

CO5 : Recognize major software architectural styles, design patterns, and frameworks.

UNIT - I FUNDAMENTALS OF ARCHITECTURE AND DESIGN (9)

Software Architecture – Elements, Stakeholders, and Architectural Descriptions – Architectural Views – Viewpoints – Viewpoint Pitfalls – Architectural Perspectives – Role of Software Architect – Design Concepts – Design Characteristics – Design Elements – Design Factors.

UNIT - II PROCESS OF SOFTWARE ARCHITECTURE (9)

Introduction to Architecture – Architecture Definition Process – Guiding Principles - Process Outcomes – Process Context – Supporting Activities – Architecture Definition Activities – Process Exit Criteria – Architectural Scope – Architectural Scope and Concerns – Architectural Principles and Constraints – Identifying and Engaging Stakeholders – Identifying and Using Scenarios – Types of Scenarios – Uses for Scenarios – Identifying and Prioritizing Scenarios – Capturing Scenarios – Applying and Use of Scenarios – Software Styles, Patterns, and Idioms.

UNIT- III ARCHITECTURE MODELS AND DESCRIPTION (9)

Producing Architectural Models – Need for Models – Types of Models – Modeling Languages – Guidelines for Creating Effective Models – Agile Modeling Techniques – Creating Architectural Description – Properties of Effective Architectural Description – Glossaries – IEEE Standard – Contents of Architectural Description – Validating the Architecture– Validation Techniques – Scenario Based Evaluation Methods – Introduction to View Point Catalog – Functional View Point.

UNIT - IV DESIGN QUALITY (9)

Software Quality Models – Effect of Design on Software Quality – Quality Attributes of Software Design – Design Principles: Design Roles, Design Processes, and Design Methods – Notion of Software Architecture – Software Architecture Style – Description of Software Architectures: Visual Notation and Client-Server Pair.

UNIT - V APPROACHES, ARCHITECTURAL AND DESIGN STYLES (9)

Typical Architecture Styles – Data Flow – Independent Components – Call & Return – Data Centred and Virtual Machine – Design Styles – Choices of Styles – Combinations of Styles – Case Study on Keyword Frequency Vector – Architectural Design Space – Theory Of Design Spaces – Design Space of Architectural Elements – Design Space of Architectural Styles.

TOTAL = 45 PERIODS

TEXT BOOKS:

1. Nick Rozanski, Eoin Woods, “Software Systems Architecture – Working with Stakeholders Using Viewpoints and Perspectives”, Pearson Education, Second Edition, 2012.
2. Hong Zhu, “Software Design Methodology – From Principles to Architectural Styles”, Elsevier, 2005.

REFERENCES:

1. David Budgen, “Software Design”, Pearson Education, 2003.
2. Len Bass, Paul Clements, Rick Kazman, “Software Architecture in Practice”, Pearson Education, Third Edition, 2012.
3. Eric J. Braude, “Software Design: From Programming to Architecture”, John Wiley & Sons, 2004

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x							x	x		x	x
2	x							x	x		x	x
3	x		x	x	x			x	x		x	x
4	x		x	x	x			x	x		x	x
5	x		x	x	x			x	x		x	x



13CSX15 SOFTWARE TESTING METHODOLOGIES

L	T	P	C
3	0	0	3

OBJECTIVES:

- To understand the basics of software testing.
- To learn the various test design strategies.
- To understand the levels of testing.
- To learn the test plan and test management.
- To understand the software testing tools and testing reviews.

COURSE OUTCOMES:

At the end of the course, the students will be able to

CO1 : Summarize software testing principles and defects.

CO2 : Differentiate various test case design strategies.

CO3 : Outline different levels of testing.

CO4 : Develop a software test plan.

CO5 : Determine suitable testing tool for a particular application.

UNIT-I INTRODUCTION

(9)

Testing as an Engineering Activity – Role of Process in Software Quality – Testing as a Process – Basic Definitions – Software Testing Principles – The Tester's Role in a Software Development Organization – Origins of Defects – Defect Classes – The Defect Repository and Test Design – Defect Examples – Developer/Tester Support for Developing a Defect Repository.

UNIT-II TEST CASE DESIGN

(9)

Test Case Design Strategies – Using Black Box Approach to Test Case Design – Random Testing – Equivalence Class Partitioning – Boundary Value Analysis – Cause and Effect Graphing – State Transition Testing – Error Guessing – Using White Box Approach to Test design – Test Adequacy Criteria – Coverage and Control Flow Graphs – Covering Code Logic – Paths: Their Role in White box Test Design – Static Vs Structural testing – Evaluating Test Adequacy Criteria.

UNIT-III TYPES OF TESTING

(9)

The Need for Levels of Testing – Unit Test – Unit Test Planning – Designing the Unit Tests– The Test Harness – Running the Unit tests and Recording results – Integration tests – Designing Integration Tests – Integration Test Planning – System Testing – Types of system testing – Acceptance testing – Performance testing – Regression Testing – Internationalization testing – Ad hoc testing.

UNIT-IV TEST PLAN AND MANAGEMENT

(9)

People and Organizational Issues in Testing – Organization Structures for Testing Teams – Testing services –Test Planning – Test Plan Components – Test Plan Attachments – Locating Test Items – Test Management – Test Process – Reporting Test Results – The role of three groups in Test Planning and Policy Development – Introducing the Test Specialist – Skills needed by a Test Specialist – Building a Testing Group.

UNIT-V TOOLS AND MONITORING

(9)

Software Test Automation – Skills needed for Automation – Scope of Automation – Design and Architecture for Automation – Requirements and Selecting a test tool – Challenges in Automation – Status Meetings, Reports and Control Issues – Criteria for Test Completion – Types of reviews – Components of Review Plans – Reporting Review Results – Test Metrics and Measurements – Case study: Using Java JUnit.

TEXT BOOKS:

1. Ilene Burnstein, “Practical Software testing- A Process-Oriented Approach”, Springer, 2009.
2. Srinivasan Desikan and Gopalaswamy Ramesh, “Software Testing–Principles and Practices”, Pearson education, 2006.

REFERENCES:

1. Aditya P.Mathur, “Foundations of Software Testing”, Pearson Education,2008.
2. Boris Beizer, “Software Testing Techniques”, Second Edition, Dreamtech, 2003
3. Elfriede Dustin, “Effective Software Testing”, First Edition, Pearson Education, 2003.
4. Renu Rajani, Pradeep Oak, “Software Testing – Effective Methods, Tools and Techniques”, Tata McGraw Hill, 2004.
5. <https://dzone.com/articles/junit-tutorial-beginners>

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x		x						x		x	x
2	x	x	x	x					x		x	x
3	x	x	x	x			x		x		x	x
4	x	x	x	x			x		x	x	x	x
5	x	x		x	x				x	x	x	x



13CSX16 SOFTWARE AGENTS

L	T	P	C
3	0	0	3

OBJECTIVES:

- To understand the software agents that reduces information overhead.
- To gain knowledge in use of software agents for cooperative learning and personal assistance.
- To know how agent can communicate and share knowledge using agent communication language.
- To gain knowledge in design of an agent interpreter and intelligent agent.
- To understand the concept of mobile technology and mobile agents and its security.

COURSE OUTCOMES:

At the end of the course, the students will be able to

- CO1 : Define the characteristics of an intelligent agent.
- CO2 : Identify agents for learning and assistance.
- CO3 : Describe the communication and collaboration among agents.
- CO4 : Understand Agent architectures.
- CO5 : Use Agent Development Environment to develop the project.

UNIT - I AGENT AND USER EXPERIENCE (9)

Agent Characteristics – Agent Types – Interacting with Agents – Agent from Direct Manipulation to Delegation – Interface Agent, Metaphor with Character – Designing Agents – Direct Manipulation versus Agent Path to Predictable.

UNIT - II AGENTS FOR LEARNING AND ASSISTANCE (9)

Agents for Information Sharing and Coordination – Agents that Reduce Work Information Overhead – Agents without Programming Language – Life like Computer Character – S/W Agents for Cooperative Learning – The M system.

UNIT - III AGENT COMMUNICATION AND COLLABORATION (9)

Overview of Agent Oriented Programming – Agent versus Object Oriented Programming – A Generic Agent Interpreter – Agent Communication Language – KQML – Applications – Agent Based Framework of Interoperability.

UNIT - IV AGENT ARCHITECTURE (9)

Agents for Information Gathering – Agent Organization – Knowledge of an Agent – Communication Language and Protocol – Query Processing – Open Agent Architecture – Communicative Action for Artificial Agent.

UNIT - V MOBILE AGENTS (9)

Mobile Agent Paradigm – Mobile Agent Concepts – Mobile Agent Technology – Programming Mobile Agents – Application of Mobile Agents – Teleshopping – Mobile Agent Security – Trust, Reliability and Reputation.

TOTAL = 45 PERIODS

TEXT BOOK:

1. Jeffrey M. Bradshaw, "Software Agents", PHI Learning Private Limited, 2010.

REFERENCES:

1. Lin, Fuhua Oscar (Ed.), "Designing Distributed Learning Environments with Intelligent Software Agents", Information Science Publishing, 2004.
2. Knapik, Michael and Jay Johnson "Developing Intelligent Agents for Distributed Systems: Exploring Architecture, Technologies, and Applications", McGraw-Hill, 1998.
3. William R. Cockayne, Michael Zyda, "Mobile Agents", Prentice Hall, 1998.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x									x	
2	x	x		x	x							
3			x	x							x	
4	x		x									
5	x	x		x							x	



13CSX17 SOFTWARE QUALITY ASSURANCE

L	T	P	C
3	0	0	3

OBJECTIVES:

- To know the role and planning of quality assurance.
- To study the importance of standards in the quality management process.
- To understand the software metrics for software quality and maintenance.
- To illustrate the software quality program concepts.
- To learn about software quality assurance standards.

COURSE OUTCOMES:

At the end of the course, the students will be able to

- CO1 : Understand the quality and configuration management processes.
- CO2 : Manage the quality of software by applying standards.
- CO3 : Analyze the software metrics and apply the quality tools in software development.
- CO4 : Demonstrate the various activities of quality planning and quality control.
- CO5 : Compare the ISO 9000 Model with SEI's CMM Level 5.

UNIT - I FUNDAMENTALS OF SOFTWARE QUALITY ASSURANCE (9)

The Role of SQA – SQA Plan – SQA considerations – SQA people – Quality Management – Software Configuration Management.

UNIT - II MANAGING SOFTWARE QUALITY (9)

Managing Software Organizations – Managing Software Quality – Defect Prevention – Software Quality Assurance Management – IT Infrastructure Library.

UNIT- III SOFTWARE QUALITY ASSURANCE METRICS (9)

Software Quality – Total Quality Management (TQM) – Quality Metrics – Software Quality Metrics: Product, In-Process – Metrics for Software Maintenance – Defect Removal Effectiveness – Applying the Seven Basic Quality Tools in Software Development.

UNIT - IV SOFTWARE QUALITY PROGRAM (9)

Software Quality Program Concepts – Establishment of a Software Quality Program – Software Quality Assurance Planning – An Overview – Purpose and Scope.

UNIT- V SOFTWARE QUALITY ASSURANCE STANDARDIZATION (9)

Software Standards – ISO 9000 Quality System Standards – Capability Maturity Model and the Role of SQA in Software Development Maturity – SEI CMM Level 5 – Comparison of ISO 9000 Model with SEI's CMM.

TOTAL = 45 PERIODS

TEXT BOOKS:

1. Watts S Humphrey, "Managing the Software Process", Fifth Indian Impression, Pearson Education, 2008.
2. Stephen H. Khan, "Metrics and Models in Software Quality Engineering", Pearson Education, Second Edition, 2003.
3. Mordechai Ben-Menachem / Garry S Marliss, "Software Quality", BS Publications, Hyderabad, 2014.

REFERENCES:

1. Gordon G Schulmeyer, "Handbook of Software Quality Assurance", Fourth Edition, Artech House Publishers, 2008
2. Nina S Godbole, "Software Quality Assurance: Principles and Practice", Alpha Science International Ltd, 2004.
3. Ian Sommerville, "Software Engineering", 10th Edition, Pearson Education, 2015.

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x							x		x	x
2	x	x			x				x		x	x
3	x	x		x	x		x	x	x		x	x
4	x	x		x	x		x	x	x		x	x
5	x		x		x			x	x		x	



Approved by Fourth Academic council

13CSX18 SOFTWARE PROJECT MANAGEMENT

L	T	P	C
3	0	0	3

OBJECTIVES:

- To recognize software project planning.
- To learn the cost estimation techniques during the analysis of the project.
- To differentiate the quality concepts for ensuring the functionality and estimation of the software.
- To understand the risk management techniques and resource allocation process.
- To manage the people behavioral aspects in the organization.

COURSE OUTCOMES:

At the end of the course, the students will be able to

- CO1 : Evaluate the activities carried out during the project scheduling.
- CO2 : Acquire knowledge to create reliable cost estimation.
- CO3 : Apply the software effort estimation and recent quality standards for evaluation of the software projects.
- CO4 : Determine the risk management activities and the resource allocation.
- CO5 : Obtain character based project learning.

UNIT - I SOFTWARE PROJECT MANAGEMENT CONCEPTS (9)

Introduction to Software Project Management – An Overview of Project Planning: Select Project – Identifying Project Scope and Objectives – Infrastructure – Project Products and activities – Estimate Efforts for Activity – Identify Activity Risks and Allocate Resources.

UNIT - II SOFTWARE EVALUATION AND COSTING (9)

Project Evaluation: Strategic Assessment – Technical Assessment – Cost-Benefit Analysis –Cash Flow Forecasting – Cost-Benefit Evaluation Techniques – Risk Evaluation – Selection of an Appropriate Project Approach: Choosing Technologies – Software Processes and Process Models – Choice of Process Models – Structured Versus Speed of Delivery.

UNIT- III SOFTWARE ESTIMATION TECHNIQUES & ACTIVITY PLANNING (9)

Software Effort Estimation: Problems With Over and Under Estimates – Basis for Software Estimation – Software Effort Estimation Techniques – Expert Judgment – Estimation by Analogy – Activity Planning: Project Schedules – Projects and Activities – Sequencing and Scheduling Activities – Networks Planning Models – Formulating a Network Model.

UNIT - IV RISK MANAGEMENT (9)

Risk Management: Introduction – Categories of Risk – A Framework for Dealing With Risk – Risk Identification – Assessment – Planning – Management – Evaluating Risk to Schedule – Resource Allocation: Scheduling Resources – Creating Critical Paths – Cost Schedules – Monitoring and Control: Creating the Framework – Cost Monitoring – Prioritizing Monitoring.

UNIT- V MANAGING PEOPLE AND ORGANIZING TEAMS (9)

Introduction – Understanding Behavior – Organizational Behavior – Selecting The Right Person for the Job – Instruction In The Best Methods – Motivation – The Oldham – Hackman Job Characteristics Model – Stress – Health and Safety – Working in Teams – Becoming a Team – Decision Making – Organizational Structures – Leadership – Case Studies.

TOTAL = 45 PERIODS

TEXT BOOK:

1. Bob Hughes & Mike Cotterell, “Software Project Management”, Tata McGraw – Hill Publications, Fifth Edition, 2012.

REFERENCES:

1. S.A. Kelkar, “Software Project Management”, PHI, New Delhi, Third Edition, 2013.
2. Richard H. Thayer, “Software Engineering Project Management”, IEEE Computer Society.
3. Web reference: <http://www.mhhe.com/engcs/compsci/pressman/student/olc/cases.mhtml>

Mapping of Course Outcomes (COs) and Programme Outcomes (POs)

Mapping of COs and POs												
COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
1	x	x								x	x	
2	x	x		x	x					x		
3			x	x						x	x	
4	x							x		x		
5				x						x	x	



Approved by Fourth Academic council

13CEZ01 INDUSTRIAL SAFETY ENGINEERING

(Common to All branches except Civil Engineering)

L	T	P	C
3	0	0	3

OBJECTIVES:

- To achieve an understanding of principles of safety engineering.
- To enable the students to learn about various functions and activities of safety department.
- To have knowledge about various hazard identification and risk assessment techniques.

COURSE OUTCOMES:

At the end of the course, the students will be able to

- CO1: Understand the functions and activities of safety engineering department.
- CO2: Prepare an accident investigation report.
- CO3: Estimate the accident cost using supervisors report and data.
- CO4: Evaluate the safety performance of an organization from accident records.
- CO5: List out requirements mentioned in factories act for the prevention of accidents.

UNIT I : CONCEPTS OF SAFETY MANAGEMENT AND ACCIDENT PREVENTION (10)

History of Safety movement – Evolution of modern safety concept - safety management functions –safety organization & safety department- safety committee - line and staff functions for safety - budgeting for safety - safety policy – accident causes - unsafe act and condition - principles of accident prevention – accident investigation and analysis – records for accidents - cost of accident.

UNIT II : HAZARD IDENTIFICATION, RISK ASSESSMENT AND CONTROL (10)

Hazard - classification - chemical, physical, mechanical, ergonomic & biological hazards - hazard evaluation techniques - job safety analysis, safety survey, safety inspection, safety sampling, - fault tree analysis – event tree analysis – failure modes and effect analysis and relative ranking techniques – past accident analysis - estimation of likelihood - consequence analysis – risk estimation – Hierarchy of Hazard control.

UNIT III : SAFETY IN ENGINEERING INDUSTRY (10)

Safety in use of machinery - turning machines, boring machines, milling machine, planning machine and grinding machines, CNC machines & wood working machinery - Principles of machine guarding -Guarding during maintenance, zero mechanical state (ZMS), definition, policy for ZMS – safety in welding and gas cutting- safety in cold forming and hot working of metals - safety in finishing, inspection and testing - occupational diseases - Lead –Nickel, Chromium &Manganese toxicity.

UNIT IV : SAFETY PERFORMANCE MONITORING (8)

Work injury experience – permanent total disabilities, permanent partial disabilities & temporary total disabilities - Calculation of accident indices, frequency rate, severity rate, frequency severity incidence, incident rate, accident rate & safety “t” – Total Injury score, illness incidence rate & Lost workday cases –Incidence rate (LWDI) & Number of lost workdays rate – problems - safety audit.

UNIT V : SAFETY AND HEALTH REGULATION (7)

History of legislations related to safety - Factories act 1948 with special reference to safety, Health and welfare provisions - Indian boiler act – smpv rules -The environmental protection act – Electricity act –Explosive act - Health and Safety at work act (HASAWA)UK, - Occupational Safety health act (OSHA) - OHSAS 18001:2007.

TOTAL: 45 PERIODS

Approved by third Academic council

TEXT BOOKS:

1. RayAsfahl.C, David W. Rieske “Industrial Safety and Health management”, Prentice Hall, 5th ed., 2009.
2. Mishra.R.K., “Safety Management ”, AITBS Publishers, 2012

REFERENCE BOOKS:

1. Dan Petersen, “Techniques of Safety Management”, McGraw-Hill Company, Tokyo, 2001.
2. Blake R.B., “Industrial Safety” Prentice Hall, Inc., New Jersey, 2003.

13CEZ02 HUMAN BEHAVIOURS AT WORK
(Common to All branches except Civil Engineering)

L	T	P	C
3	0	0	3

OBJECTIVES:

- This course will help the student to understand about ergonomics and Human behaviour.
- To know the importance of anthropometry and designing the machine for man.

COURSE OUTCOMES:

At the end of the course, the students will be able to

- CO1: Understand about ergonomics, anthropometry, designing a job for the worker.
- CO2: Student will have a deep knowledge about human behaviour.
- CO3: Know the fundamental aspects of standing and sitting, an ergonomics approach.
- CO4: Gain knowledge about man Vs machine handling task
- CO5: Know about a general information about human skill and performance

UNIT I : ERGONOMICS AND ANATOMY

(9)

Introduction to ergonomics: - The focus of ergonomics, ergonomics and its areas of application in the work system, a brief history of ergonomics, attempts to humanize work, modern ergonomics, future directions for ergonomics. Anatomy, Posture and Body Mechanics: - Some basic body mechanics, anatomy of the spine and pelvis related to posture, posture stability and posture adaptation, low back pain, risk factors for musculoskeletal disorders in the workplace, behavioral aspects of posture, effectiveness and cost effectiveness, research directions.

UNIT II : HUMAN BEHAVIOR

(9)

Individual differences - Factors contributing to personality - Fitting the man to the job - Influence of difference on safety - Method of measuring characteristics - Accident Proneness – Motivation - Complexity of motivation - Job satisfaction - Management theories of motivation - Job enrichment theory - Frustration and Conflicts - Reaction to frustration - Emotion and Frustration - Attitudes-Determination of Attitudes - Changing attitudes Learning - Principles of Learning – Forgetting - Motivational requirements.

UNIT III : ANTHROPOMETRY AND WORK DESIGN FOR STANDING AND SEATED WORKS

(9)

Designing for a population of users, percentile - sources of human variability, anthropometry and its uses in ergonomics - principals of applied anthropometry in ergonomics - application of anthropometry in design, design for everyone - anthropometry and personal space, effectiveness and cost effectiveness - Fundamental aspects of standing and sitting, an ergonomics approach to work station design - design for standing workers, design for seated workers - work surface design - visual display units, guidelines for design of static work.

UNIT IV : MAN MACHINE SYSTEM AND REPETITIVE WORKS AND MANUAL HANDLING TASK

(9)

Applications of human factors engineering, man as a sensor, man as information processor, man as controller – Man vs Machine - Ergonomics interventions in Repetitive works, handle design, key board design measures for preventing in work related musculoskeletal disorders (WMSDs) - reduction and controlling - training Anatomy and biomechanics of manual handling - prevention of manual handling injuries in the work place - design of manual handling tasks - carrying, postural stability.

UNIT V : HUMAN SKILL AND PERFORMANCE

(9)

A general information-processing model of the users - cognitive system, problem solving – effectiveness - Principles for the design of visual displays - auditory displays - design of controls combining displays and controls- virtual (synthetic) environments - research issues.

TOTAL: 45 PERIODS

TEXTBOOKS:

1. Bridger.R.S, “Introduction to Ergonomics”, CRC Press, Third Edition, 2012.

REFERENCES :

1. Michael O’Neill. “Ergonomic design for organizational effectiveness”, CRC Press, 2004.
2. Mark S Sanders, Ernest J. McCormick. “Human factors in engineering and design”, Tata McGraw Hill 2006.
3. Dan Macleod, Roderick MacLeod. “The Ergonomics Edge: Improving Safety, Quality and Productivity”, John Wiley and Sons, 2008.

13CEZ03 AIR POLLUTION MANAGEMENT
(Common to All branches except Civil Engineering)

L	T	P	C
3	0	0	3

OBJECTIVES:

- This subject covers the sources, characteristics and effects of air and noise pollution and the methods of controlling the same.
- The student is expected to know about source inventory and control mechanism.

COURSE OUTCOMES:

At the end of the course, the students will be able to

- CO1: Understand about nature and characteristics of air pollutants.
- CO2: Understand the basic elements of atmosphere and its stability.
- CO3: An ability to design stacks and particulate air pollution control devices to meet applicable standards.
- CO4: Understand the basic concepts of air quality management.
- CO5: An ability to identify, formulate and solve air and noise pollution problems.

UNIT I : SOURCES AND EFFECTS OF AIR POLLUTANTS

(9)

Classification of air pollutants – Particulates and gaseous pollutants – Sources of air pollution – Source inventory – Effects of air pollution on human beings, materials, vegetation, animals – global warming-ozone layer depletion, Sampling and Analysis – Basic Principles of Sampling – Source and ambient sampling – Analysis of pollutants – Principles.

UNIT II : DISPERSION OF POLLUTANTS

(9)

Elements of atmosphere – Meteorological factors – Wind roses – Lapse rate - Atmospheric stability and turbulence – Plume rise – Dispersion of pollutants – Dispersion models – Applications.

UNIT III : AIR POLLUTION CONTROL

(12)

Concepts of control – Principles and design of control measures – Particulates control by gravitational, centrifugal, filtration, scrubbing, electrostatic precipitation – Selection criteria for equipment - gaseous pollutant control by adsorption, absorption, condensation, combustion – Pollution control for specific major industries.

UNIT IV : AIR QUALITY MANAGEMENT

(8)

Air quality standards – Air quality monitoring – Preventive measures - Air pollution control efforts – Zoning – Town planning regulation of new industries – Legislation and enforcement – Environmental Impact Assessment and Air quality.

UNIT V : NOISE POLLUTION

(7)

Sources of noise pollution – Effects – Assessment - Standards – Control methods – Prevention.

TOTAL: 45 PERIODS

TEXTBOOKS:

1. Anjaneyulu, D., “Air Pollution and Control Technologies”, Allied Publishers, Mumbai, 2002.
2. Rao, C.S. Environmental Pollution Control Engineering, Wiley Eastern Ltd., New Delhi, 1996.
3. Rao M.N., and Rao H. V. N., Air Pollution Control, Tata McGraw Hill, New Delhi, 1996.

REFERENCES:

1. Heumann. W.L., "Industrial Air Pollution Control Systems", McGraw Hill, New York, 1997.
2. Mahajan S.P., "Pollution Control in Process Industries", Tata McGraw Hill Publishing Company, New Delhi, 1991.
3. Peavy S.W., Rowe D.R. and Tchobanoglous G. "Environmental Engineering", McGraw Hill, New Delhi, 1985.
4. Garg, S.K., "Environmental Engineering Vol. II", Khanna Publishers, New Delhi, 1998
5. Mahajan, S.P., "Pollution Control in Process Industries", Tata McGraw Hill, New Delhi, 1991.
6. Thod Godesh, "Air Quality, Lewis India Edition, 2013.

13CEZ04 BUILDING SERVICES
(Common to All branches except Civil Engineering)

L	T	P	C
3	0	0	3

OBJECTIVES:

- This course will help the student to understand about ergonomics and Human behaviour.
- To know the importance of anthropometry and designing the machine for man.
- Planning and scheduling the frequency of inspection and maintenance of building

COURSE OUTCOMES:

At the end of the course, the students will be able to

- CO1: Student will know about the basic electrical systems in buildings
- CO2: Gain knowledge about the modern lighting systems.
- CO3: Study about the HVAC systems.
- CO4: know the concept of planning considerations and fire safety installation in buildings
- CO5: Study about the concepts of plumbing and drainage in building.

UNIT I : ELECTRICAL SYSTEMS IN BUILDINGS

(9)

Basics of electricity – Single / Three phase supply – Protective devices in electrical installations – Earthing for safety – Types of earthing – ISI specifications – Types of wires, wiring systems and their choice – Planning electrical wiring for building – Main and distribution boards – Transformers and switch gears – Layout of substations.

UNIT II : PRINCIPLES OF ILLUMINATION & DESIGN

(9)

Visual tasks – Factors affecting visual tasks – Modern theory of light and colour –Synthesis of light – Additive and subtractive synthesis of colour – Luminous flux – Candela – Solid angle illumination – Utilisation factor – Depreciation factor – MSCP – MHCP – Lanes of illumination – Classification of lighting – Artificial light sources – Spectral energy distribution – Luminous efficiency – Colour temperature – Colour rendering. Design of modern lighting – Lighting for stores, offices, schools, hospitals and house lighting. Elementary idea of special features required and minimum level of illumination required for physically handicapped and elderly in building types.

UNIT III : REFRIGERATION PRINCIPLES & APPLICATIONS

(9)

Thermodynamics – Heat – Temperature, measurement transfer – Change of state – Sensible heat – Latent heat of fusion, evaporation, sublimation – saturation temperature – Super heated vapour – Sub cooled liquid – Pressure temperature relationship for liquids – Refrigerants – Vapour compression cycle – Compressors – Evaporators – Refrigerant control devices – Electric motors – Starters – Air handling units – Cooling towers – Window type and packaged air-conditioners – Chilled water plant – Fan coil systems – Water piping – Cooling load – Air conditioning systems for different types of buildings – Protection against fire to be caused by A.C. Systems.

UNIT IV FIRE SAFETY INSTALLATION

(9)

Causes of fire in buildings – Safety regulations – NBC – Planning considerations in buildings like non-combustible materials, construction, staircases and lift lobbies, fire escapes and A.C. systems. Special features required for physically handicapped and elderly in building types – Heat and smoke detectors – Fire alarm system, snorkel ladder – Fire lighting pump and water storage – Dry and wet risers – Automatic sprinklers.

UNIT V PLUMBING AND DRAINAGE

(9)

Plumbing fixtures and fixture fittings – Water conserving fittings – Over flows – Strainers and connectors – Prohibited fixtures – Special fixtures – Installation of water closet – Urinals - Flushing devices – Floor drains – Shower stall – Bath tub – Bidets – Minimum plumbing facilities – Rain water harvesting systems – Necessity – Construction – Different types .

Total: 45 PERIODS

Approved by third Academic council

REFERENCES:

1. E.R.Ambrose, "Heat Pumps and Electric Heating", John and Wiley and Sons, Inc., New York, 1968.
2. Handbook for Building Engineers in Metric systems, NBC, New Delhi, 1968.
3. Philips Lighting in Architectural Design, McGraw-Hill, New York, 1964.
4. R.G.Hopkinson and J.D.Kay, "The Lighting of buildings", Faber and Faber, London,
5. 1969.
6. William H.Severns and Julian R.Fellows, "Air-conditioning and Refrigeration", John
7. Wiley and Sons, London, 1988.
8. A.F.C. Sherratt, "Air-conditioning and Energy Conservation", the Architectural Press, London, 1980.

13CSZ01 COMPUTER NETWORKS
(Common to All branches except CSE Branch)

L	T	P	C
3	0	0	3

OBJECTIVES:

- To understand the division of network functionalities into layers.
- To be familiar with the components required to build different types of networks.
- To be exposed to the required functionality at each layer.
- To learn the flow control and congestion control algorithms.

COURSE OUTCOMES:

At the end of the course, the student should be able to:

- CO1: Identify the components required to build different types of networks
- CO2: Choose the required functionality at each layer for given application
- CO3: Identify solution for each functionality at each layer.

UNIT I : FUNDAMENTALS & PHYSICAL LAYER (9)

Building a network – Requirements - Layering and protocols - Network software – Performance –Encoding schemes-Ethernet (802.3) –Wireless LANs – 802.11.

UNIT II : DATA LINK LAYER (9)

Link layer Services – Framing – Error Detection –Flow control –Media access control –Flow and error control Protocols– Connecting LANS: Connecting devices.

UNIT III : NETWORK LAYER (9)

Internetworking-IPV4 – Address Mapping – ARP – RARP – ICMP – IGMP – Forwarding –Routing – Unicast and multicast routing – RIP – OSPF – DVR–LSR.

UNIT IV : TRANSPORT LAYER (9)

Overview of Transport layer - UDP - Reliable byte stream (TCP) - Connection management – Flow control - Retransmission – TCP Congestion control - Congestion avoidance (DECbit, RED) – QoS – Application requirements

UNIT V : APPLICATION LAYER (9)

Traditional applications –Electronic Mail (SMTP, POP3, IMAP, MIME) – HTTP – FTP – Web Services – DNS .

TOTAL: 45 PERIODS

TEXT BOOK:

1. Behrouz A. Forouzan, “Data communication and Networking”, Fourth Edition, Tata McGraw Hill,2011.

REFERENCE BOOKS:

1. Larry L. Peterson, Bruce S. Davie, “Computer Networks: A Systems Approach”, Fifth Edition, Morgan Kaufmann Publishers, 2011.
2. James F. Kurose, Keith W. Ross, “Computer Networking - A Top-Down Approach Featuring the Internet”, Fifth Edition, Pearson Education, 2009.
3. Nader. F. Mir, “Computer and Communication Networks”, Pearson Prentice Hall Publishers, 2010.

13CSZ02 SOFTWARE ENGINEERING
(Common to All branches except CSE Branch)

L	T	P	C
3	0	0	3

OBJECTIVES:

- To Understand the life cycle models of software process
- To Understand fundamental concepts of requirements engineering and Analysis Modeling
- To learn the systematic procedure for software design
- To Implement the strategies for software testing
- To explore the significance of project planning and management.

COURSE OUTCOMES:

At the end of the course, the student should be able to:

- CO1: Identify the key activities in managing a software project.
- CO2: Compare different process models.
- CO3: Implement the Concepts of requirements engineering and Analysis Modeling.
- CO4: Apply systematic procedure for software design and deployment.
- CO5: Compare and contrast the various testing and maintenance.

UNIT I: SOFTWARE PROCESS

(9)

Introduction –Software Engineering Paradigm – life cycle models (water fall, incremental, spiral, WINWIN spiral, evolutionary, prototyping, object oriented) - system engineering – computer based system – verification – validation.

UNIT II: SOFTWARE REQUIREMENTS

(9)

Functional and non-functional - user – system –requirement engineering process – feasibility studies – requirements – elicitation – validation and management – software prototyping – prototyping in the software process – rapid prototyping techniques – user interface prototyping -Software document. Analysis and modeling – data, functional and behavioral models – structured analysis and data dictionary.

UNIT III: SOFTWARE DESIGN

(9)

Design process – Design Concepts-Design Model– Design Heuristic – Architectural Design – Architectural styles, Architectural Design, Architectural Mapping using Data Flow- User Interface Design: Interface analysis, Interface Design –Component level Design: Designing Class based components, traditional Components.

UNIT IV: SOFTWARE TESTING

(9)

Taxonomy of software testing – levels – test activities – types of software test – black box testing – testing boundary conditions – structural testing – test coverage criteria based on data flow mechanisms – regression testing – testing in the large - software testing strategies - testing using extreme programming.

UNIT V: SOFTWARE PROJECT MANAGEMENT

(9)

Estimation – FP Based, LOC Based, Make/Buy Decision, COCOMO II - Planning – Project Plan, Planning Process, RFP Risk Management – Identification, Projection, RMMM - Scheduling and Tracking –Relationship between people and effort, Task Set & Network, Scheduling, EVA – Process and Project Metrics

TOTAL: 45 PERIODS

TEXT BOOK:

1. Roger S. Pressman, “Software Engineering – A Practitioner’s Approach”, 7th ed., Mc Graw-Hill International Edition, 2010.

REFERENCES :

1. Ian Sommerville, “Software Engineering”, 9th ed., Pearson Education Asia, 2011.
2. Rajib Mall, “Fundamentals of Software Engineering”, Third Edition, PHI COURSE Private Limited, 2009.
3. Pankaj Jalote, “Software Engineering - A Precise Approach”, Wiley India, 2010.
4. Kelkar S.A., “Software Engineering”, Prentice Hall of India Pvt Ltd, 2007.
5. Stephen R.Schach, “Software Engineering”, Tata McGraw-Hill Publishing Company.

13CSZ03 DATA STRUCTURES
(Common to All branches except CSE Branch)

L	T	P	C
3	0	0	3

OBJECTIVES :

- To learn the basics of abstract data types.
- To learn the principles of linear and non linear data structures.
- To learn various searching and sorting techniques.
- To learn different tree traversals.

COURSE OUTCOMES:

At the end of the course, the student should be able to:

- CO1: Demonstrate the concept of linear and non linear data structures.
CO2: Determine the efficiency of algorithms.
CO3: Design of algorithms for various searching and sorting techniques.

UNIT I: INTRODUCTION

(9)

Pseudo code–Abstract data types-Model for an ADT-ADT Implementations-Algorithm efficiency-Time complexity and space complexity-Designing recursive algorithms-Recursive examples.

UNIT II: STACKS, QUEUES AND LISTS

(9)

Arrays – Basic stack operation- Stack ADT - Applications of stack – Queues operations- Queue ADT – Queue applications -List ADT - Circular - Doubly linked list.

UNIT III: SORTING AND SEARCHING TECHNIQUES

(9)

Sorting: Insertion Sort- Selection Sort- Bubble Sort - Merge sort – Quick sort –Heap sort-shell sort-Searching: Sequential search- Binary Search – Hashed list searches.

UNIT IV: NON LINEAR LIST

(9)

Basic Tree concepts - Binary Trees – Tree Traversals – Expression Trees - Binary Search Trees – AVL Search Trees- Splay Trees.

UNIT V: GRAPHS

(9)

Definitions – Traverse Graph: Depth first Traversal-Breadth first Traversal-Shortest Path Algorithms: Unweighted Shortest Paths – Dijkstra's Algorithm. Minimum Spanning Tree: Prim's Algorithm– Kruskal's Algorithm.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Richard F. Gilberg, and Behrouz A. Forouzan, Data Structures – A Pseudocode Approach with C, Thomson 2009.
2. M.A.Weiss, Data Structures and Algorithm Analysis in C, Pearson Education Asia, 2007.

REFERENCE BOOKS:

1. Y.Langsam, M.J.Augenstein and A.M.Tenenbaum, Data Structures using C, PHI, 2004
2. Aho, J.E.Hopcroft and J.D.Ullman, Data Structures and Algorithms, Pearson education, Asia, 2010
3. Ellis Horowitz, Sartaj Sahni and Susan Anderson-Freed, Fundamentals of Data Structures in C, Silicon Press, 2007.

13CSZ04 OPEN SOURCE SOFTWARE
(Common to All branches except CSE Branch)

L	T	P	C
3	0	0	3

OBJECTIVES:

- To understand the basics of open source operating systems.
- To gain the knowledge of working with Linux platform and open source database.
- To be familiar with programming languages PHP, Perl, Python.

COURSE OUTCOMES:

At the end of the course, the student should be able to:

- CO1: Ability to install and run open-source operating systems.
- CO2: Ability to gather information about Free and Open Source Software projects from software releases and from sites on the internet.
- CO3: Develop programs using PHP, Perl, Python and MySQL.

UNIT I: INTRODUCTION

(9)

Introduction to Open sources – Need of Open Sources – Advantages of Open Sources –Application of pen Sources. Open source operating systems: LINUX: Introduction – General Overview – Kernel Mode and user mode – Process – Advanced Concepts – Scheduling – Personalities – Cloning – Signals –Development with Linux.

UNIT II: OPEN SOURCE DATABASE

(9)

MySQL: Introduction – Setting up account –Starting, terminating and writing your own SQL programs – Record selection Technology – Working with strings –Date and Time – Sorting Query Results – Generating Summary – Working with metadata – Using sequences –MySQL and Web.

UNIT III: OPEN SOURCE PROGRAMMING LANGUAGES

(9)

PHP: Introduction – Programming in web environment – variables – constants – data types – operators – Statements – Functions – Arrays – OOP –String Manipulation and regular expression – File handling and data storage – PHP and SQL database – PHP and LDAP – PHP Connectivity – Sending and receiving E-mails – Debugging and error handling – Security –Templates.

UNIT IV: PYTHON

(9)

Syntax and Style – Python Objects – Numbers – Sequences – Strings –Lists and Tuples – Dictionaries – Conditionals and Loops – Files – Input and Output –Errors and Exceptions – Functions – Modules – Classes and OOP –Execution Environment.

UNIT V: PERL

(9)

Perl backgrounder – Perl overview – Perl parsing rules – Variables and Data –Statements and Control structures –Subroutines, Packages, and Modules- Working with Files –Data Manipulation.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Remy Card, Eric Dumas and Frank Mevel, “The Linux Kernel Book”, Wiley Publications, 2003.
2. Steve Suchring, “MySQL Bible”, John Wiley, 2002

REFERENCE BOOKS:

1. Rasmus Lerdorf and Levin Tatroe, “Programming PHP”, O’Reilly, 2002
2. Wesley J. Chun, “Core Python Programming”, Prentice Hall, 2001
3. Martin C. Brown, “Perl: The Complete Reference”, 2nd Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint 2009.
4. Steven Holzner, “PHP: The Complete Reference”, 2nd Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint 2009.

13CSZ05 INFORMATION SECURITY
(Common to All branches except CSE branch)

L	T	P	C
3	0	0	3

OBJECTIVES:

- To understand the basics of Information Security
- To know the legal, ethical and professional issues in Information Security
- To know the aspects of risk management
- To become aware of various standards in this area
- To know the technological aspects of Information Security

COURSE OUTCOMES:

At the end of the course, the student should be able to:

- CO1: Understand the basics of Information Security
- CO2: Know the legal, ethical and professional issues in Information Security
- CO3: Know the aspects of risk management
- CO4: Become aware of various standards in this area
- CO5: Know the technological aspects of Information Security

UNIT I: INTRODUCTION

(9)

History, What is Information Security?, Critical Characteristics of Information, NSTISSC Security Model, Components of an Information System, Securing the Components, Balancing Security and Access, The SDLC, The Security SDLC.

UNIT II: SECURITY INVESTIGATION

(9)

Need for Security, Business Needs, Threats, Attacks, Legal, Ethical and Professional Issues.

UNIT III: SECURITY ANALYSIS

(9)

Risk Management: Identifying and Assessing Risk, Assessing and Controlling Risk

UNIT IV: LOGICAL DESIGN

(9)

Blueprint for Security, Information Security Policy, Standards and Practices, ISO 17799/BS 7799, NIST Models, VISA International Security Model, Design of Security Architecture, Planning for Continuity

UNIT V: PHYSICAL DESIGN

(9)

Security Technology, IDS, Scanning and Analysis Tools, Cryptography, Access Control Devices, Physical Security, Security and Personnel

TOTAL: 45 PERIODS

TEXT BOOK:

1. Michael E Whitman and Herbert J Mattord, "Principles of Information Security", Vikas Publishing House, New Delhi, 2003

REFERENCES:

1. Micki Krause, Harold F. Tipton, "Handbook of Information Security Management", Vol 1-3 CRC Press LLC, 2004.
2. Stuart Mc Clure, Joel Scrambray, George Kurtz, "Hacking Exposed", Tata McGraw Hill, 2003
3. Matt Bishop, "Computer Security Art and Science", Pearson/PHI, 2002.

13ECZ01 - AVIONICS (OE)
(Common to All Branches except ECE branch)

L	T	P	C
3	0	0	3

OBJECTIVES:

- To understand the needs for avionics for both Civil and military aircraft.
- To introduce various digital electronic principles and working operations of digital circuit.
- To integrate the digital electronics with cockpit equipments.
- To understand the various principles in flight disk and cockpit panels.

COURSE OUTCOMES:

At the end of this course, the students will be able to

- CO1 : Describe the hardware required for aircraft.
CO2 : Explain the communication and navigation techniques used in aircrafts.
CO3 : Discuss about the autopilot and cockpit display related concepts.

UNIT- I INTRODUCTION TO AVIONICS (9)

Definition and origin of robotics – different types of robotics – various generations of robots – degrees of freedom – Asimov’s laws of robotics – dynamic stabilization of robots.

UNIT- II DIGITAL AVIONICS BUS ARCHITECTURE (9)

Hydraulic, pneumatic and electric drives – determination of HP of motor and gearing ratio – variable speed arrangements – path determination – micro machines in robotics – machine vision – ranging – laser – acoustic – magnetic, fiber optic and tactile sensors.

UNIT- III AVIONICS SYSTEMS (9)

Construction of manipulators – manipulator dynamics and force control – electronic and pneumatic manipulator control circuits – end effectors – U various types of grippers – design considerations.

UNIT- IV ON BOARD NAVIGATION SYSTEMS (9)

Solution of inverse kinematics problem – multiple solution Jacobian work envelop – hill Climbing Techniques – robot programming languages.

UNIT- V CASE STUDY (9)

Multiple robots – machine interface – robots in manufacturing and non- manufacturing applications – robot cell design – selection of robot.

TOTAL: 45 PERIODS

TEXT BOOK:

1. R.P.G. Collinson, “Introduction to Avionics”, Chapman & Hall Publications, 1996. Ghosh, Control in Robotics and Automation: Sensor Based Integration, Allied Publishers, Chennai, 1998.

REFERENCES:

1. Cary R .Spitzer, “The Avionics Handbook”, CRC Press, 2000.
2. Middleton, D.H. “Avionics Systems”, Longman Scientific and Technical, Longman Group UK.Ltd., England, 1989.
3. Spitzer, C.R. “Digital Avionics Systems”, Prentice Hall, Englewood Cliffs, N.J., U.S.A., 1987.
4. Brain Kendal, “Manual of Avionics”, The English Book House, 3rd Edition, New Delhi, 1993
5. Jim Curren, “Trend in Advanced Avionics”, IOWA State University, 1992.

13ECZ02 SENSORS AND TRANSDUCERS

(Common to All Branches except ECE branch)

L	T	P	C
3	0	0	3

OBJECTIVES:

- To impart knowledge on various types of sensors and transducers for Automation in science, Engineering and medicine.

COURSE OUTCOMES:

At the end of this course, the students will be able to

CO1 : Know basic concepts of various sensors and transducers.

CO2 : Develop knowledge in selection of suitable sensor based on requirement and applications.

UNIT- I INTRODUCTION (9)

Definition, classification, static and dynamic parameters, Characterization – Electrical, mechanical, thermal, optical, biological and chemical, Classification of errors – Error analysis, Static and dynamic characteristics of transducers, Performance measures of sensors.

UNIT-II MECHANICAL AND ELECTROMECHANICAL SENSORS (9)

Resistive Potentiometer, strain gauge, Inductive sensors and transducer, capacitive sensors, ultrasonic sensors.

UNIT-III THERMAL SENSOR (9)

Thermal Sensors: Gas thermometric sensors, acoustic temperature sensors, magnetic thermometer, resistance change -type thermometric sensors, thermo emf sensors, junction semiconductor types.

UNIT-IV MAGNETIC SENSOR (9)

Magnetic Sensors: Force and displacement measurement, magneto resistive sensors, Hall Effect sensor, Inductance and eddy current sensors, Angular/rotary movement transducer, Electromagnetic flow meter, squid sensor.

UNIT-V SENSORS AND THEIR APPLICATIONS (9)

Automobile sensor, Home appliance sensor, Aerospace sensors, sensors for manufacturing, medical diagnostic sensors, environmental monitoring.

TOTAL: 45 PERIODS

TEXT BOOK:

1. Patranabis D, “Sensor and Actuators”, Prentice Hall of India (Pvt) Ltd., 2006

Approved by third Academic council

REFERENCES:

1. Ian Sinclair, "Sensor and Transducers", Elsevier India Pvt Ltd, 3rd Edition, 2011.
2. A.K. Sawhney, Puneeth sawhney, "A Course in Electrical and Electronic Measurements and Instrumentation", Dhanpat Rai Publications, 2012.
3. Ernest O. Doebelin, "Measurement System, Application and Design", Tata McGraw Hill Publishing Company Ltd., 5 th Edition, 2008.

13ECZ03 MODERN WIRELESS COMMUNICATION SYSTEMS (OE)
(Common to All Branches except ECE branch)

L	T	P	C
3	0	0	3

OBJECTIVES:

- This course is to provide comprehensive background knowledge of wireless and mobile communication.
- This course is intended for anyone who wants to learn about the new wave of wireless networks.

COURSE OUTCOMES:

At the end of this course, the students will be able to

- CO1 : Discuss the fundamentals of cellular mobile wireless networks.
CO2 : Provide an overview of various approaches to communication networks.
CO3 : Study the numerous different-generation technologies
CO4 : Know about the principles of operation of the different access technologies like FDMA, TDMA, SDMA and CDMA

UNIT- I TRANSMISSION FUNDAMENTALS (9)

Cellphone Generations: 1G, 2G, 2.5G, 3G & 4G Transmission Fundamentals: Time domain & Frequency domain concepts, Radio, Analog Vs Digital, channel capacity, transmission media, carrier-based signaling, spread-spectrum signaling.

UNIT –II NETWORK CONCEPTS (9)

Communication Networks: LANs, MANs, WANs, circuit switching, packet switching, ATM Cellular Networks: Cells, duplexing, multiplexing, voice coding Multiple Access Techniques: FDMA, TDMA, SDMA, CDMA, spectral efficiency.

UNIT- III PERSONAL COMMUNICATION SERVICES (9)

GSM, HSCSD, GPRS, D-AMPS, CDMA One, CDMA Two, Packet Data Systems.

UNIT- IV 3G & BEYOND (9)

IMT-2000, W-CDMA, CDMA 2000, EDGE, Wi-Fi, WiMAX, OFDM.

UNIT- V MOBILE DATA SERVICES & SHORT-RANGE NETWORKS (9)

Mobile Data Services: Messaging, wireless web, WAP, site design Short-Range Wireless Networks: Unlicensed spectrum, WLANs, cordless telephony, IrDA, Bluetooth .Smart Phones: Future phones, mobile OSs, smart phone applications.

TOTAL : 45PERIODS

TEXT BOOKS:

1. Andy Dornan, “The essential guide to wireless communications applications: from cellular systems to Wi-Fi”, 2nd Edition, Prentice Hall, 2002.
2. Misra, “Wireless Communications and Networks: 3G & Beyond”, Tata McGraw-Hill, 2013.

REFERENCES:

1. Theodore S. Rappaport, “Wireless Communications: Principles and Practice”, 2nd Edition, Pearson Education, 2009.
2. William Stallings, “Wireless communications and networking”, Prentice Hall, 2005.

13ECZ04 RADAR AND NAVIGATIONAL AIDS (OE)
(Common to All Branches except ECE branch)

OBJECTIVES:

L	T	P	C
3	0	0	3

- To make the student understand the principles of Radar and its use in military and civilian environment
- Also to make the student familiar with navigational aids available for navigation of aircrafts and ships.

COURSE OUTCOMES:

At the end of this course, the students will be able to

- | | | |
|-----|---|--|
| CO1 | : | Derive and discuss the Range equation and the nature of detection. |
| CO2 | : | Apply Doppler principle to radars and hence detect moving targets, cluster, also to understand tracking radars |
| CO3 | : | Refresh principles of antennas and propagation as related to radars, also study of transmitters and receivers. |
| CO4 | : | Understand principles of navigation, in addition to approach and landing aids as related to navigation |

UNIT I INTRODUCTION TO RADAR (9)

Basic Radar –The simple form of the Radar Equation- Radar Block Diagram- Radar Frequencies –Applications of Radar – The Origins of Radar

UNIT II MTI AND PULSE DOPPLER RADAR (9)

Introduction to Doppler and MTI Radar- Delay –Line Cancelers- Staggered Pulse Repetition Frequencies –Doppler Filter Banks - Digital MTI Processing - Moving Target Detector - MTI from a Moving Platform (AMIT) – Pulse Doppler Radar

UNIT III DETECTION OF SIGNALS IN NOISE (9)

Radar Transmitters- Introduction –Linear Beam Power Tubes - Solid State RF Power Sources - Magnetron - Crossed Field Amplifiers - Other RF Power Sources – Other aspects of Radar Transmitter. Radar Receivers - The Radar Receiver - Receiver noise Figure – Superheterodyne Receiver

UNIT IV HYPERBOLIC SYSTEMS OF NAVIGATION (9)

Loran-A - Loran-A Equipment- Range and precision of Standard Loran - Loran-C - The Decca Navigation System
-Decca Receivers - Range and Accuracy of Decca - The Omega System

UNIT V DME AND TACAN (9)

Distance Measuring Equipment - Operation of DME - TACAN - TACAN Equipment Aids to Approach and Landing - Instrument Landing System - Ground Controlled Approach System - Microwave Landing System
Satellite Navigation System - The Transit System - Navstar Global Positioning System(GPS)

TOTAL : 45 PERIODS

TEXTBOOKS:

1. Merrill I. Skolnik, " Introduction to Radar Systems", Tata McGraw-Hill (3rd Edition) 2003.
2. N.S.Nagaraja, Elements of Electronic Navigation Systems, 2nd Edition, TMH, 2000.

REFERENCES:

1. Peyton Z. Peebles:, "Radar Principles", Johnwiley, 2004
2. J.C Toomay, " Principles of Radar", 2nd Edition –PHI, 2004

13EEZ01 RENEWABLE ENERGY TECHNOLOGY

(Common to All Branches except EEE branch)

L	T	P	C
3	0	0	3

OBJECTIVES:

- To emphasize the current energy status and role of renewable energy
- To know about the various concept of solar and wind energy
- To know about the various concept of biomass and other renewable energy sources

COURSE OUTCOMES:

At the end of this course, the students will be able to

CO1: Plan appropriate kind of energy for the future development

CO2: Know basics of solar energy

CO3: Understand the concepts of wind energy

CO4: Understand and apply concepts of biomass energy

CO5: Understand other renewable energy sources

UNIT I : INTRODUCTION

(9)

World energy status, Current energy scenario in India, Environmental aspects of energy utilization, Environment-Economy - Energy and Sustainable Development, Energy planning. Reserves of Energy resources - Renewable energy resources - Potentials - Achievements - applications - Technical and social implications, issues in grid integration of power from renewable energy sources.

UNIT II : SOLAR ENERGY

(9)

Basic concepts, Solar radiation – Measurement, Solar thermal systems – Flat plate and concentrating collectors, Solar passive space – Solar heating and cooling techniques – Solar desalination – Solar Pond – Solar cooker – Solar dryers – Solar furnaces – Solar pumping – Solar green house- Solar thermal electric power plant – Solar photo voltaic conversion – Solar cells – PV applications – Hybrid systems.

UNIT III : WIND ENERGY

(9)

Introduction – Availability- Wind power plants, Power from the wind, Wind energy conversion systems, site characteristics – Wind turbines types – Horizontal and vertical axis – Design principles of wind turbine – Blade element theory - Magnus effect – Performance – Wind energy Applications – Hybrid systems – Wind energy storage – Safety and environmental aspects.

UNIT IV : BIOMASS ENERGY

(9)

Biomass – Usable forms- composition – Fuel properties – Applications – Biomass resource – Biomass conversion technologies – Direct combustion – Pyrolysis – Gasification – Anaerobic digestion – Bioethanol and Biodiesel Production – Economics – Recent developments – Energy farming – Biogas technology – Family biogas plants – Community and institutional biogas plants – design consideration – Applications

UNIT V : OTHER RENEWABLE ENERGY SOURCES

(9)

Tidal energy – Wave energy – Open and closed OTEC Cycles – Small hydro – Geothermal energy – Social and environmental aspects – Fuel cell technology: Types, principle of operation, applications – Hydrogen energy production – Storage – Transportation – Utilization.

TOTAL: 45 PERIODS

TEXTBOOKS:

1. Godfrey Boyle, "Renewable Energy", Power for a Sustainable Future, Oxford University Press, U.K, 1996.
2. Twidell.J.W & Weir.A, "Renewable Energy Sources", EFN Spon Ltd., UK, 1986.
3. Tiwari.G.N, "Solar Energy - Fundamentals Design", Modelling and applications, Narosa PublishingHouse, NewDelhi, 2002.

REFERENCES:

1. Kothari P, K C Singal and Rakesh Ranjan, "Renewable Energy Sources and Emerging Technologies", PHI Pvt. Ltd.,New Delhi, 2008.
2. G.D. Rai, "Non Conventional Energy Sources", Khanna Publishers, New Delhi, 1999.
3. S.P. Sukhatme, "Solar Energy", Tata McGraw Hill Publishing Company Ltd., New Delhi, 1997.

13EEZ02 PLC AND AUTOMATION
(Common to All Branches except EEE branch)

L	T	P	C
3	0	0	3

OBJECTIVES:

- To impart knowledge on Programmable Logic Controller and Automation
- To design controller for industrial automation system

COURSE OUTCOMES:

At the end of this course, the students will be able to

CO1: Select the right hardware for a given application

CO2: Consider such aspects of the automation system as network communication and human machine interface

UNIT I : PROGRAMMABLE LOGIC CONTROLLERS (9)

Basics of PLC - Architecture of PLC - Advantages - Types of PLC - Introduction to PLC Networking- Networking standards - Protocols - Field bus - Process bus and Ethernet IEEE Standard.

UNIT II : PROGRAMMING OF PLC & HMI SYSTEMS PROGRAMMING OF PLC (9)

Types of Programming - Simple process control programs using Relay Ladder Logic and Boolean logic methods - PLC arithmetic functions - Introduction to advanced programming methods.

HMI systems: Necessity and Role in Industrial Automation, Text display - Operator panels - Touch panels - Panel PCs – Integrated displays (PLC & HMI).

UNIT III : DISTRIBUTED CONTROL SYSTEMS (DCS) (9)

Difference between SCADA system and DCS - Architecture - Local control unit - Programming language – communication facilities - Operator interface - Engineering interfaces.

UNIT IV : APPLICATIONS OF PLC & DCS (9)

Case studies of Machine automation - Process automation - Introduction to SCADA - Comparison between SCADA and DCS.

UNIT V : AUTOMATION (9)

Factory Automation: Flexible Manufacturing Systems concept – Automatic feeding lines, ASRS, transfer lines, automatic inspection – Computer Integrated Manufacture – CNC - Intelligent automation - Industrial networking, - Bus standards - HMI Systems - DCS and SCADA - Wireless controls.

TOTAL: 45 PERIODS

TEXTBOOK:

1. John.W.Webb & Ronald A. Reis, “Programmable logic controllers: Principles and Applications”, Prentice Hall of India, 2003.

REFERENCES:

1. Michael P. Lukas, “Distributed Control systems”, Van Nostrand Reinhold Company, 1995.
2. Gary Dunning, “Introduction to Programmable Logic Controllers”, Thomson Press, USA, 2005.
3. W. Bolton, “Programmable Logic Controllers”, Elsevier India Private Limited, New Delhi, 2008.
4. Mikell P. Groover, “Automation Production systems and Computer Integrated Manufacturing”, Prentice Hall of India, New Delhi, 2007.

13EEZ03 AUTOMOTIVE ELECTRONICS
(Common to All Branches except EEE branch)

L	T	P	C
3	0	0	3

OBJECTIVES:

- To study the electronic instruments for automobiles
- To study the advanced electronics instruments for ignition and braking systems

COURSE OUTCOMES:

At the end of this course, the students will be able to

- CO1: Provide an introduction and a deep knowledge in various ignition and instrumentation systems in vehicles
- CO2: Model and stimulate the various modern electronics automotive systems by using various numerical analysis and simulation tools
- CO3: Formulate and solves electronic engineering challenges related to the most representative automotive systems using the classical and modern methodologies in electronics engineering

UNIT I : INTRODUCTION

(9)

Automotive component operation - Electrical wiring terminals and switching - Multiplexed wiring systems - Circuit diagrams and symbols - Charging Systems and Starting Systems: Charging systems principles, alternations and charging circuits - Basic starting circuit.

UNIT II : IGNITION SYSTEMS

(9)

Ignition fundamental, Electronic ignition systems - Programmed ignition distribution less ignition direct ignition spark plugs - Electronic Fuel Control - Basics of combustion Engine fuelling and exhaust emissions - Electronic control of carburetion - Petrol fuel injection Diesel fuel injection.

UNIT III : INSTRUMENTATION SYSTEMS

(9)

Introduction to instrumentation systems - Various sensors used for different parameters sensing - Driver instrumentation systems - Vehicle condition monitoring trip - Different types of visual display

UNIT IV : ELECTRONIC CONTROL OF BRAKING AND TRACTION

(9)

Introduction and description control elements - control methodology - electronic control of automatic transmission - Introduction and description Control of gear shift and torque converter lockup - Electric power steering - Electronic clutch.

UNIT V : ENGINE MANAGEMENT SYSTEMS

(9)

Combined ignition and fuel management systems - Exhaust emission control - Digital control techniques - Complete vehicle control systems - Artificial intelligence and engine management - Automotive microprocessor uses.

Lighting and Security Systems:

Vehicles lighting Circuits - Signaling Circuit Central locking and electric windows security systems - Airbags and seat belt tensioners - Miscellaneous safety and comfort systems.

TOTAL: 45 PERIODS

TEXT BOOK:

1. Tom Denton, "Automobile Electrical and Electronic Systems", Edward Arnold publications, 1995

REFERENCES:

1. Don Knowles, Don Knowles, Prentice Hall, Englewood Cliffs, “Automotive Electronic and Computer controlled Ignition Systems”, New Jersey 1988.
2. William, T.M., “Automotive Electronic Systems”, Heiemann Ltd., London ,1978.
3. Ronald K Jurgen, “Automotive Electronics Handbook”, McGraw Hill, Inc, 1999.

13EEZ04 UTILIZATION AND CONSERVATION OF ELECTRICAL ENERGY

(Common to All Branches except EEE branch)

L	T	P	C
3	0	0	3

OBJECTIVES:

- To impart knowledge on Generation of electrical power by conventional and non – conventional methods
- To expose students to the main aspects of generation, utilization and conservation
- Electrical energy conservation, energy auditing and power quality
- Principle and design of illumination systems and methods of heating and welding

COURSE OUTCOMES:

At the end of this course, the students will be able to

- CO1: De
sign the wiring circuits and protection schemes for various types of electrical installations
- CO2: Ap
ply the electric drives and their power supply systems used in various types of electric traction applications
- CO3: Ac
quire software development skills and experience in the usage of standard packages necessary for analysis

UNIT I : ILLUMINATION, HEATING AND WELDING (9)

Nature of radiation – definition – laws – Photometry – Lighting calculations – Design of illumination systems (for residential, industrial, commercial, health care, street lightings, sports, administrative complexes) - Types of lamps - energy efficiency lamps. Methods of heating, requirement of heating material – Design of heating element –Furnaces – Welding generator – Welding transformer and its characteristics.

UNIT II : ELECTRIC TRACTION (9)

Introduction – requirements of an ideal traction system – Supply systems – Mechanics of train movement – Traction motors and control – Multiple units – Braking – Current collection systems – Recent trends in electric traction.

UNIT III : DRIVES AND THEIR INDUSTRIAL APPLICATIONS (9)

Introduction – motor selection and related factors – Loads – Types – Characteristics – Steady state and transient characteristics – Load equalization – Industrial applications – Modern methods of speed control of industrial drives.

UNIT IV : CONSERVATION (9)

Economics of generation – definitions – load curves – number and size of units – cost of electrical energy – tariff – need for electrical energy conservation – methods – energy efficient equipment – energy management – energy auditing. Economics of power factor improvement – design for improvement of power factor using power capacitors – power quality – effect on conservation.

UNIT V : DEMAND SIDE MANAGEMENT (9)

Introduction - Automated demand response - Peak saving - Load Leveling - Load control- Issues Involving the Implementation Demand Side Management Solutions - Public Benefits Programs, Rate Schedules, Time-of-Use Rates, Power Factor Charges, and Real - Time Pricing - Solar investment tax credit.

TOTAL : 45 PERIODS

TEXT BOOKS:

1. E. Openshaw Taylor, Utilization of Electrical Energy in SI Units, Orient Longman Pvt.Ltd, 2003.
2. B.R. Gupta, Generation of Electrical Energy, Eurasia Publishing House (P) Ltd, New Delhi, 2003.

REFERENCES:

1. H. Partab, "Art and Science of Utilisation of Electrical Energy", Dhanpat Rai and Co, New Delhi, 2004.
2. Gopal.K.Dubey, "Fundamentals of Electrical Drives", Narosa Publishing House, New Delhi, 2002.
3. C.L. Wadhwa, Generation, "Distribution and Utilization of Electrical Energy", New Age International Pvt.Ltd, 2003.
4. J.B. Gupta, "Utilization of Electric Power and Electric Traction", S.K.Kataria and Sons, 2002.

13EIZ01 AUTOTRONIX
(Common to All Branches except EIE branch)

L	T	P	C
3	0	0	3

OBJECTIVES:

- This course focuses on the extent and nature of electronic circuitry in automotive systems including monitoring and control circuits for engines, emission control system, ignition systems and fuel systems.
- The course imparts applications of sensors on automotive systems

COURSE OUTCOMES:

At the end of the course, students will be able to

- CO1: Understand the application of electronics in automotive industry.
- CO2: Identify different control systems in automotives and their control.
- CO3: Design and implement various control algorithms in automotives.
- CO4: Demonstrate different instrumentation systems in automotives.
- CO5: Identify, formulate and solve real time engineering problems.

UNIT I : FUNDAMENTALS OF AUTOMOTIVE ELECTRONICS (9)

Electronic Engine Management System – Components – Open and Closed Loop Control Strategies – PID Control – Look Up Tables – Introduction – Modern Control Strategies Like Fuzzy Logic and Adaptive Control – Controlled Parameters – SI and CI Engines.

UNIT II : SENSORS AND ACTUATORS (9)

Introduction – Basic Sensor Arrangement – Types Of Sensors – Hall Effect Sensor – Hot Wire Anemometer – Thermistor – Piezo-Electric Sensor – Piezo-Resistive Sensors – Oxygen Concentration Sensor – Lambda Sensor – Crankshaft Angular Position Sensor – Cam Position Sensor – Mass Air Flow (MAF) Rate – Manifold Absolute Pressure (MAP) – Throttle Plate Angular Position – Engine Oil Pressure Sensor – Vehicle Speed Sensor – Stepper Motors – Relays – Detonation Sensor – Emission Sensors .

UNIT III : SPARK IGNITION ENGINE MANAGEMENT (9)

Feedback Carburetor System – Throttle Body Injection – Multi Point Fuel Injection System – Injection System Controls –Advantage of Electronic Ignition Systems – Three Way Catalytic Converter – Conversion Efficiency Versus Lambda – Group and Sequential Injection Techniques – Fuel System Components – Advantages of Electronic Ignition Systems –Solid State Ignition Systems – Principle Of Operation – Types – Contact Less Electronic Ignition System – Electronic Spark Timing Control.

UNIT IV : COMPRESSION IGNITION ENGINE MANAGEMENT (9)

Fuel Injection System – Parameters Affecting Combustion – Noise and Emissions in CI Engines – Pilot, Main, Advanced – Post Injection and Retarded Post Injection – Electronically Controlled Unit Injection System – Layout of the Common Rail Fuel Injection System – Fuel Injector – Fuel Pump – Rail Pressure Limiter – Flow Limiter – Working Principle – EGR Valve Control in Electronically Controlled Systems.

UNIT V : DIGITAL ENGINE CONTROL SYSTEM (9)

Open Loop and Closed Loop Control System – Engine Cooling and Warm Up Control – Idle Speed Control – Acceleration and Full Load Enrichment – Deceleration Fuel Cut-off – Fuel Control Maps – Open Loop Control of Fuel Injection – Closed Loop Lambda Control – Exhaust Emission Control – On Board Diagnostics: Diagnostics – Future Automotive Electronic Systems.

TOTAL:45 PERIODS

TEXT BOOKS:

1. Arthur Primrose Young, Leonard Griffiths, “Automobile Electrical and Electronic Equipment”, London Butterworths, 9th ed, 1986.
2. William Ribbens, “Understanding Automotive Electronics: An Engineering Perspective”, Butterworth-Heinemann, 7th ed., 2013.

REFERENCES:

1. Allan Bonnick, “Automotive Computer Controlled Systems” Taylor & Francis, Fifth Edition, 2001.
2. Tom Denton, “Automobile Electrical and Electronics Systems”, Butterworth-Heinemann, Fourth Edition, 2004.
3. Robert Bosch GmbH, “Diesel-Engine Management”, John Wiley & Sons, Fourth Edition, 2006.
4. Robert Bosch GmbH and Horst Bauer, “Gasoline-Engine Management”, Bentley Publishers, Second Edition, 2006.
5. Robert. N, Brady, “Automotive Computers and Digital Instrumentation”, Prentice Hall, First Edition, 1988.
6. V.A.W Hillier, “Fundamentals of Automotive Electronics”, Nelson Thornes Limited, Sixth Edition, 2012.

OBJECTIVES:

- This course introduces fundamental physical principles of both classical and modern optics as well as principles of optical design used in the engineering of optical systems.
- The course also provides exposure to practical aspects of optical materials and devices.
- The intention of the course is to provide foundation of basic principles, design methodology, and practical considerations needed to design or use optical and laser instruments in engineering practice.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1: Understand the basic concepts of optical fibres and their properties.

CO2: Have adequate knowledge about the Industrial applications of optical fibres.

CO3: Relate and identify different types interferometric optical fibre sensors and their applications.

CO4: Demonstrate fibre components.

CO5: Understand fibre optic sensor multiplexing.

UNIT I : OPTICAL SOURCES AND DETECTORS

(9)

Light-emitting diode-Principles, Structures, LED characteristics, Modulation of LED. Lasers-Principles, Laser diode structures and radiation pattern, Laser characteristics, Modulation of Semiconductor Laser. Photo detectors-Principles, Quantum efficiency, Responsivity of P.I.N photodiode, and Avalanche photodiode.

UNIT II : OPTICAL FIBER SENSORS AND DEVICES

(9)

Overview of fibre optic sensors – advantages over conventional sensors, broadband classification. Intensity Modulated Optical Fibre Sensors-Introduction, intensity modulation through light interruption shutter/ schlieren multimode fibre optic sensors – reflective fibre optic sensors, evanescent wave fibre sensors -microbend optical fibre sensors – fibre optic refractometers, intensity modulated fibre optic thermometers, distributed sensing with fibre optics.

UNIT III : INTERFEROMETRIC OPTICAL FIBRE SENSORS

(9)

Introduction, basic principles of interferometric optical fibre sensors, components and applications of interferometric sensors. Fused Single Mode Optical Fibre Couplers-Introduction, physical principles (coupling coefficient) polarization effect, experimental properties, theoretical modelling, and comparison with experiment.

UNIT IV : SINGLE MODE ALL FIBRE COMPONENTS

(9)

Introduction, directional couplers, polarizes, polarization splitters polarization controllers, optical isolators, single mode fibre filters wave length multiplexers and demultiplexers, switches and intensity modulators, phase and frequency modulators.

UNIT V : FIBRE OPTIC SENSOR MULTIPLEXING

(9)

Introduction, general topological configuration, and incoherent and coherent detection. Signal Processing in Monomode Fibre Optic Sensor Systems-Introduction, Transduction mechanisms, Optical Signal Processing, Electronic Processing.

TOTAL:45 PERIODS

TEXT BOOKS:

1. Dr. M. Arumugam, “Optical Fiber Communications and Sensors”. Anuradha Publications, 3rd ed., 2014.

REFERENCES:

1. Gerd Keiser, “ Optical Fiber Communications” , McGraw Hill, 3rd ed., 2001
2. Bishnu, P PAL “Fundamentals of Fibre Optics in Telecommunication and Sensor Systems” Wiley Eastern Ltd, 1994.

13EIZ03- INDUSTRIAL AUTOMATION
(Common to All Branches except EIE branch)

L	T	P	C
3	0	0	3

OBJECTIVES:

- This course produces students who can use their multidisciplinary skills to meet growing demand from an industry that is pushing the limits of technology by exploiting the growing convergence of these fields.
- The course aims to provide knowledge on fundamentals of robots, robot programming, and its vision system and apply to demonstrate their knowledge in real time application.

COURSE OUTCOMES:

At the end of this course, the students will be able to

- CO1: Demonstrate the concepts of robotic principles and various robot configurations.
- CO2: Develop solutions for the robot position and orientation for given application.
- CO3: Identify the appropriate configuration for the application.
- CO4: Design intelligence systems incorporating real time data capturing using vision systems.
- CO5: Understand robotic programming and develop simple robotic systems.

UNIT I : BASIC CONCEPTS

(9)

Definition and origin of robotics –different types of robotics–various generations of robots –degrees of freedom – Asimov’s laws of robotics – dynamic stabilization of robots.

UNIT II : POWER SOURCES AND SENSORS

(9)

Hydraulic, pneumatic and electric drives–determination of HP of motor and gearing ratio–variable speed arrangements –path determination –micro machines in robotics–machine vision–ranging –laser –acoustic–magnetic, fiber optic and tactile sensors.

UNIT III : MANIPULATORS, ACTUATORS AND GRIPPERS

(9)

Construction of manipulators–manipulator dynamics and force control–electronic and pneumatic manipulator control circuits–end effectors–U various types of grippers–design considerations.

UNIT IV : KINEMATICS AND PATH PLANNING

(9)

Solution of inverse kinematics problem–multiple solution jacobian work envelop–hill climbing Techniques – robot programming languages

UNIT V : CASE STUDIES

(9)

Mutiple robots–machine interface–robots in manufacturing and non-manufacturing applications –robot cell design–selection of robot.

TOTAL : 45 PERIODS

TEXT BOOKS:

1. Industrial Robotics (SIE): Technology, Programming and Applications Nicholas Odrey, Mitchell Weiss, Mikell Groover, Roger Nagel, Ashish Dutta , Mcgrawhill, 2012.
2. Ghosh, Control in Robotics and Automation: Sensor Based Integration, Allied Publishers, Chennai, 1999.

REFERENCES:

1. S.R. Deb, Robotics technology and flexible Automation, John Wiley, USA 1992.
2. C.R. Asfahl., Robots and manufacturing Automation, John Wiley, USA 1992.
3. R.D. Klafter, T.A. Chimielewski, M. Negin, Robotic Engineering –An integrated approach, Prentice Hall of India, New Delhi, 1994.
4. P.J. Mc Kerrow, Introduction to Robotics, Addison Wesley, USA, 1991.
5. Issac Asimov I Robot, Ballantine Books, New York, 1986.

13EIZ04 ULTRASONIC INSTRUMENTATION
(Common to All Branches except EIE branch)

L	T	P	C
3	0	0	3

OBJECTIVES:

- This course provides adequate knowledge about the properties of ultrasonic wave and the method of generation.
- It also gives the knowledge about the testing and applications of ultrasonic waves.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1: Demonstrate properties and characteristics of ultrasonic wave.

CO2: Generate and test ultrasonic waves using different methods.

CO3: Measure the properties of ultrasonic wave and apply to various real time applications

CO4: Analyze Gyroscopic Instruments and engine Instruments.

UNIT I : ULTRASONIC WAVES CHARACTERISTICS

(9)

Ultrasonic waves – Principle and propagation of various waves – Characterization of ultrasonic transmission – Reflection and transmission coefficients – Intensity and attenuation of sounds beam Power level – Medium parameters.

UNIT II : ULTRASONIC WAVE GENERATION

(9)

Generation of ultrasonic waves – Magnetostrictive and piezoelectric effects – Search unit types – Construction and characteristics

UNIT III : ULTRASONIC TEST METHODS

(9)

Ultrasonic test methods – Pulse echo – Transit time – Resonance – Direct contact and immersion type – Ultrasonic methods of flaw detection.

UNIT IV : ULTRASONIC MEASUREMENTS

(9)

Ultrasonic measurements – Ultrasonic methods of measuring thickness, depth and flow – Variables affecting ultrasonic testing in various applications.

UNIT V : ULTRASONIC APPLICATIONS

(9)

Ultrasonic applications – Ultrasonic applications in medical diagnosis and therapy, acoustical holography.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. J David and N Cheeke, “ Fundamentals and Applications of Ultrasonic Waves”, CRC Press 2002.
2. Dale Ensminger, “ Ultrasonic: Fundamentals, Technology and Applications”, CRC press 1988.

REFERENCES:

1. Baldev Raj Palanichamy and V Rajendran, “Science and Technology of Ultrasonic”, Alpha Science 2004.
2. Emmanuel P Papadakis, “ Ultrasonic Instruments and Devices: Reference for Modern Instrumentation Techniques, and Technology”, Academic Press, 1999.

13ITZ01 PC HARDWARE AND TROUBLE SHOOTING
(Common to All Branches except IT branch)

L	T	P	C
3	0	0	3

OBJECTIVES:

- This course will provide participant a much needed knowledge of computer hardware and networking, enabling them to identify and rectify the onboard computer hardware, software and network related problems.
- upgrading of existing hardware / software as and when required. The main aspect of this program is to eliminate cost for the computer engineer boarding the vessel for troubleshoot, install / configure the application program and network related problems and there by charging exorbitant fees to ship owners / managers.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1: Disassemble and reassemble a working computer Handle and repair

CO2: Establish a local computer network & Load and configure a working Windows Operating System

CO3: Make minor repairs and upgrades to a laptop computer& evaluate a computer system for individual customers, making suggestions to optimize the system for the individual

CO4: Implement the design using Objective C and iOS

CO5: Configure the power management features on a computer system,Troubleshoot, configure and repair printers

UNIT I : INTRODUCTION

(9)

Introduction - Computer Organization – Number Systems and Codes – Memory – ALU – CU – Instruction prefetch – Interrupts – I/O Techniques – Device Controllers - Error Detection Techniques – Microprocessor – Personal Computer Concepts – Advanced System Concepts – Microcomputer Concepts – OS – Multitasking and Multiprogramming – Virtual Memory – Cache Memory – Modern PC and User.

UNIT II : PERIPHERAL DEVICES

(9)

Introduction – Keyboard – CRT Display Monitor – Printer – Magnetic Storage Devices – FDD – HDD – Special Types of Disk Drives – Mouse and Trackball – Modem – Fax Modem – CD ROM Drive – Scanner – Digital Camera – DVD – Special Peripherals.

UNIT III : PC HARDWARE OVERVIEW

(9)

Introduction – Hardware BIOS DOS Interaction – The PC family – PC hardware – Inside the System Box – Motherboard Logic – Memory Space – Peripheral Interfaces and Controllers – Keyboard Interface – CRT Display interface – FDC – HDC.

UNIT IV : INSTALLATION AND PREVENTIVE MAINTENANCE

(9)

Introduction – system configuration – pre installation planning – Installation practice – routine checks – PC Assembling and integration – BIOS setup – Engineering versions and compatibility – preventive maintenance – DOS – Virus – Data Recovery.

UNIT V : TROUBLESHOOTING

(9)

Introduction – computer faults – Nature of faults – Types of faults – Diagnostic programs and tools – Microprocessor and Firmware – Programmable LSI's – Bus Faults – Faults Elimination process – Systematic Troubleshooting – Symptoms observation and analysis – fault diagnosis – fault rectification – Troubleshooting levels – FDD, HDD, CD ROM Problems.

TOTAL: 45 PERIODS

TEXT BOOK:

1. B. Govindarajalu, "IBM PC Clones Hardware, Troubleshooting and Maintenance", 2/E, TMH, 2002.

REFERENCES:

1. Peter Abel, Niyaz Nizamuddin, "IMB PC Assembly Language and Programming", Pearson Education, 2007.
2. Scott Mueller, "Repairing PC's", PHI, 1992

13ITZ02 ESSENTIALS OF INFORMATION TECHNOLOGY
(Common to All Branches except IT branch)

L	T	P	C
3	0	0	3

OBJECTIVES:

- To provide extensive knowledge on IT Essentials including client-server modeling, designing data store, and working with Internet.
- To document artifacts using common quality standards.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1: Understand fundamentals computer hardware and operating system concepts.

CO2: Use techniques, skills and apply algorithmic principles to Identify, formulate and solve problems.

CO3: Understand and apply object oriented concepts.

UNIT : I :

(9)

Fundamentals of Computer architecture-introduction-organization of a small computer-Central Processing Unit - Execution cycle – Instruction categories – measure of CPU performance Memory – Input/output devices - BUS-addressing modes. System Software –Assemblers – Loaders and linkers – Compilers and interpreters. Operating system – introduction – memory management schemes Process management Scheduling – threads.

UNIT : II

(9)

Problem solving with algorithms- Programming styles – Coding Standards and Best practices - Introduction to C Programming Testing and Debugging. Code reviews System Development Methodologies – Software development Models User interface Design – introduction – The process – Elements of UI design and reports.

UNIT : III

(9)

RDBMS- data processing – the database technology – data models. ER modeling concept – notations – Extended ER features. Logical database design – normalization SQL – DDL statements – DML statements – DCL statements. Writing Simple queries – SQL Tuning techniques – Embedded SQL – OLTP.

UNIT : IV

(9)

Objected oriented concepts – object oriented programming. UML Class Diagrams– relationship – Inheritance – Abstract classes – polymorphism Object Oriented Design methodology - Common Base class Alice Tool – Application of OOC using Alice tool.

UNIT : V

(9)

Client server computing - Internetworking – Computer Networks – Working with TCP/IP – IP address – Sub netting – DNS – VPN – proxy servers World Wide Web – Components of web application - browsers and Web Servers URL – HTML – HTTP protocol – Web Applications - Application servers – Web Security.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Andrew Tanenbaum, Modern Operating Systems, Pearson Education, Third Edition, 2007.
2. Elmasri, Navathe, Fundamentals of Database Systems, Addison Wesley, Fifth Edition, 2006.

REFERENCES:

1. Sivasubramanyam Y, Deepak Ranjan Shenoy, Foundation Program - Computer Hardware & System Software Concepts, version 1.0 Vol-1, Infosys: Campus Connect 2008.
2. Hanumesh V.J.,Seema Acharya, Foundation Program - Relational Database Management System, Client Server Concepts, Introduction to Web technologies version 1.0 Vol-2, Infosys: Campus Connect 2008.
3. Sundar K.S., Foundation Program - Analysis of Algorithms, Object Oriented Concepts, System Development Methodology, User Interface Design version 1.0 Vol-3, Infosys: Campus Connect 2008.

13ITZ03 DEVELOPING MOBILE APPS
(Common to All Branches except IT branch)

L	T	P	C
3	0	0	3

OBJECTIVES:

- Understand system requirements for mobile applications.
- Generate suitable design using specific mobile development frameworks .
- Generate mobile application design.
- Implement the design using specific mobile development frameworks .
- Deploy the mobile applications in marketplace for distribution.

COURSE OUTCOMES:

At the end of the course, students will be able to

- CO1: Describe the requirements for mobile applications
- CO2: Explain the challenges in mobile application design and development
- CO3: Implement the design using Android SDK
- CO4: Implement the design using Objective C and iOS
- CO5: Deploy mobile applications in Android and iPone marketplace for distribution

UNIT I : INTRODUCTION

(5)

Introduction to mobile applications – Embedded systems - Market and business drivers for mobile applications – Publishing and delivery of mobile applications – Requirements gathering and validation for mobile applications

UNIT II : BASIC DESIGN

(8)

Introduction – Basics of embedded systems design – Embedded OS - Design constraints for mobile applications, both hardware and software related – Architecting mobile applications – User interfaces for mobile applications – touch events and gestures – Achieving quality constraints – performance, usability, security, availability and modifiability.

UNIT III : ADVANCED DESIGN

(8)

Designing applications with multimedia and web access capabilities – Integration with GPS and social media networking applications – Accessing applications hosted in a cloud computing environment – Design patterns for mobile applications.

UNIT IV : TECHNOLOGY I - ANDROID

(12)

Introduction – Establishing the development environment – Android architecture – Activities and views – Interacting with UI – Persisting data using SQLite – Packaging and deployment – Interaction with server side applications – Using Google Maps, GPS and Wifi – Integration with social media applications.

UNIT V : TECHNOLOGY II - IOS

(12)

Introduction to Objective C – iOS features – UI implementation – Touch frameworks – Data persistence using Core Data and SQLite – Location aware applications using Core Location and Map Kit – Integrating calendar and address book with social media application – Using Wifi - iPhone marketplace.

TOTAL : 45 PERIODS

TEXT BOOKS:

1. <http://developer.android.com/develop/index.html>
2. Jeff McWherter and Scott Gowell, "Professional Mobile Application Development", Wrox, 2012

REFERENCES :

1. Charlie Collins, Michael Galpin and Matthias Kappler, "Android in Practice", DreamTech, 2012
2. James Dovey and Ash Furrow, "Beginning Objective C", Apress, 2012
3. David Mark, Jack Nutting, Jeff LaMarche and Frederic Olsson, "Beginning iOS 6 Development: Exploring the iOS SDK", Apress, 2013.

13ITZ04 SOFTWARE PROJECT MANAGEMENT

(Common to All Branches except IT branch)

L	T	P	C
3	0	0	3

OBJECTIVES :

- To plan and manage projects at each stage of the software development life cycle (SDLC).
- To train software project managers and other individuals involved in software project planning and tracking and oversight in the implementation of the software project management process.
- To understand successful software projects that support organization's strategic goals.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1: Evaluate and select the most desirable projects & Identify desirable characteristics of effective project managers.

CO2: Apply appropriate approaches to plan a new project.

CO3: Apply appropriate methodologies to develop a project schedule.

CO4: Develop a suitable budget for a new project & Identify important risks facing a new project.

UNIT I : INTRODUCTION TO SOFTWARE PROJECT MANAGEMENT

(9)

Project Definition – Contract Management – Activities Covered By Software Project Management – Overview Of Project Planning – Stepwise Project Planning.

UNIT II : PROJECT EVALUATION

(9)

Strategic Assessment – Technical Assessment – Cost Benefit Analysis –Cash Flow Forecasting – Cost Benefit Evaluation Techniques – Risk Evaluation.

UNIT III : ACTIVITY PLANNING

(9)

Objectives – Project Schedule – Sequencing and Scheduling Activities –NetworkPlanning Models – Forward Pass – Backward Pass – Activity Float – Shortening Project Duration – Activity on Arrow Networks – Risk Management – Nature Of Risk – Types Of Risk – Managing Risk – Hazard Identification – Hazard Analysis – Risk Planning And Control.

UNIT IV : MONITORING AND CONTROL

(9)

Creating Framework – Collecting The Data – Visualizing Progress – Cost Monitoring – Earned Value – Prioritizing Monitoring – Getting Project Back To Target – Change Control – Managing Contracts – Introduction – Types Of Contract – Stages In Contract Placement – Typical Terms Of A Contract – Contract Management – Acceptance.

UNIT V : MANAGING PEOPLE AND ORGANIZING TEAMS

(9)

Introduction – Understanding Behavior – Organizational Behaviour: A Background –Selecting The Right Person For The Job – Instruction In The Best Methods – Motivation– The Oldman – Hackman Job Characteristics Model – Working In Groups – Becoming A Team –Decision Making – Leadership – Organizational Structures – Stress – Health And Safety – Case Studies.

TOTAL: 45 PERIODS

TEXT BOOK:

1. Bob Hughes, Mikecoterrell, “Software Project Management”, Third Edition, Tata McGraw Hill, 2004.

REFERENCES:

1. Ramesh, Gopaldaswamy, "Managing Global Projects", Tata McGraw Hill, 2001.
2. Royce, “Software Project Management”, Pearson Education, 1999.
3. Jalote, “Software Project Management in Practice”, Pearson Education, 2002.

13MEZ01 SIX SIGMA
(Common to All Branches except Mechanical Engineering)

L	T	P	C
3	0	0	3

OBJECTIVES:

- To develop a comprehensive set of skills that will allow the engineers to function effectively as six sigma team members.
- To introduce the techniques and various phases of six sigma for professionals

COURSE OUTCOMES:

At the end of the course, the students will be able to,

CO1: Understand and apply the five-step DMAIC model as a framework to organize process or business improvement activity

CO2: Employ Six Sigma skills to lead a successful process or business improvement project.

UNIT I : INTRODUCTION

(9)

Overview of Six Sigma and Lean Manufacturing - 6 sigma, TQM & MBNQA - common terms - organizational success factors - leadership, strategic initiative - internal communication - launching of 6 sigma - organizational structure - six sigma training plan - project selection - assessing organizational readiness - common pitfalls - work as a process - vertical functions and horizontal processes

UNIT II : PREPARATION PHASE

(9)

Voice of the customer - importance, identify the customer, collect VOC data, Critical-to-Quality customer requirements - project management - challenges - project culture - project management processes - team typing- team stages - understanding team dynamics - forming, storming, norming, performing, characteristics of effective teams

UNIT III : DEFINE AND MEASURE PHASE

(9)

DMAIC Phases - define phase overview - project charter - voice of the customer - high level process map - project team - measure phase overview - statistical methods - normal distribution - Population Parameters Vs Sample Statistics - sampling plan - data collection plan - choosing statistical software - measure tools - measurements - cost of poor quality - probability distributions - measurement system analysis - Process Capability

UNIT IV : ANALYZE AND IMPROVE PHASE

(9)

Overview - process analysis - hypothesis testing - statistical tests and tables - tools for analyzing relationships among variables - survival analysis - improve phase overview - process redesign - generating improvement alternatives - design of experiments - pilot experiments - Cost/Benefit Analysis - implementation plan - card one case study improve phase results

UNIT V : CONTROL PHASE, DESIGN FOR SIX SIGMA AND LEAN SERVICING

(9)

Control phase overview - control plan - process scorecard - failure mode and effects analysis - SPC Charts - final project report and documentation - design for six sigma overview - DFSS Tools - Quality Function Deployment – TRIZ - Lean Production Overview - lean servicing concepts - getting started with lean - continuous flow production - case study

TOTAL: 45 PERIODS

TEXT BOOK:

1. Betsi Harris Ehrlich, “Transactional Six Sigma and Lean Servicing”, St. Lucie Press, 2002

REFERENCES:

1. Michael L George, David T Rowlands, and Bill Kastle, “What is Lean Six Sigma”, McGraw Hill, New York, 2004.
2. Kai Yang and Basem El Haik, “Design for Six Sigma”, McGraw Hill, New York, 2004.
3. Thomas Pyzdek, “Six Sigma Handbook: Complete Guide for Green belts, Black belts and Managers at All Levels”, Tata McGraw Hill Companies Inc, 2003.
4. Donald W Benbow and Kubiak T M, “Certified Six Sigma Black Belt Handbook”, Pearson Education, 2007.

13MEZ02 ESSENTIALS OF RADIO FREQUENCY IDENTIFICATION
(Common to All Branches except Mechanical Engineering)

L	T	P	C
3	0	0	3

OBJECTIVES:

- To understand the physical principle of RFID system.
- To get knowledge on information processing through RFID system.

COURSE OUTCOMES:

At the end of the course, the students will be able to,

CO1: Demonstrate various components of RFID system

CO2: Apply the methodology in engineering applications like inventory management, material handling etc.,

UNIT I : INTRODUCTION AND RFID ARCHITECTURE (9)

Case for RFID - Eras of RFID - applications - RFID Architecture - confluence of technologies - key functionalities- system components - systemic quality considerations - architecture guidelines - System Management

UNIT II : TAGS AND PROTOCOLS (9)

Basic tag capabilities - physical characteristics - power source - air interface - information storage and processing capacity - standards - protocol terms and concepts - how tags store data - singulation and anti-collision procedures- tag features for security and privacy - learn to troubleshoot tag communications

UNIT III : READERS, PRINTERS AND READER PROTOCOLS (9)

Physical and logical components of RFID reader - parts of RFID printer and applicator - types of readers - layout for readers and antennas - configuring readers - parts of a reader protocol - vendor protocols - EPC global protocol overview - simple lightweight RFID reader protocol - future protocols

UNIT IV : MIDDLEWARE AND INFORMATION SERVICE (9)

Motivations - logical architecture - application level events specification - commercial RFID middleware - RFID Data - EPC global network - object naming service - EPC information services

UNIT V : MANAGEABILITY, PRIVACY AND SECURITY (9)

Edge deployment options - capabilities needed for edge management - standards and technologies - privacy and security issues - RFID Privacy - RFID Security - EPC identity encodings

TOTAL : 45 PERIODS

TEXT BOOK:

1. Himanshu Bhatt, Bill Glover, "RFID Essentials", O'Reilly Media publications, 2006

REFERENCES:

1. Klaus Finkenzeller, "RFID Handbook", John Wiley & Sons, Ltd, 2010
2. Stephen B. Miles, Sanjay E. Sarma, John R. Williams, "RFID Technology and Applications", Cambridge University Press, 2008
3. Patrick J Sweeney, "RFID for DUMMIES", Wiley India Publications, 2005
4. Elaine Cooney, "RFID + The Complete review of Radio Frequency Identification", 1st ed., Delmar Cengage Learning 2007

13MEZ03 ELECTRIC VEHICLE TECHNOLOGY
(Common to All Branches except Mechanical Engineering)

L	T	P	C
3	0	0	3

OBJECTIVES:

- To know the various components of electric vehicles and their working principles.
- To get knowledge on types of batteries and fuel cell

COURSE OUTCOMES:

At the end of the course, the students will be able to,

CO1: Identify the elements of an electric vehicle for a particular application.

CO2: Apply the knowledge on mathematical modelling to find out the operating characteristics of an electric vehicle.

UNIT I : INTRODUCTION AND BATTERIES

(9)

Types of electric vehicle - battery parameters - lead acid batteries - nickel based batteries - battery charging - designer's choice of battery - use of batteries in hybrid vehicles - battery modelling

UNIT II : ALTERNATIVE ENERGY SOURCES AND FUEL CELLS

(9)

Solar photovoltaics - wind power - flywheels - super capacitors - supply rails - hydrogen fuel cells - fuel cell thermodynamics - connecting cells in series - water and thermal management in PEM fuel cell

UNIT III : HYDROGEN SUPPLY AND STORAGE

(9)

Introduction - fuel reforming - fuel cell requirements, steam reforming, partial oxidation and autothermal reforming, further fuel processing, mobile applications - storage as hydrogen - chemical methods

UNIT IV : ELECTRIC MACHINES AND CONTROLLERS

(9)

Brushed DC electric motor - DC regulation and voltage conversion - brushless electric motors - motor cooling, efficiency, size and mass - electrical machines for hybrid vehicles

UNIT V : ELECTRIC VEHICLE MODELLING AND DESIGN CONSIDERATIONS

(9)

Introduction - tractive effort - modelling vehicle acceleration and electric vehicle range - simulations - aerodynamic considerations - rolling resistance - transmission efficiency - vehicle mass - general issues

TOTAL : 45 PERIODS

TEXT BOOK:

1. James Larminie, John Lowry, "Electric Vehicle Technology Explained", John Wiley & Sons Ltd 2012

REFERENCES:

1. Mehrdad Ehsani, Yimin Gao, Ali Emadi, "Modern Electric, Hybrid Electric, and Fuel Cell Vehicles", 2nd ed., CRC Press 2009
2. Chau.K.T, "Electric vehicle machines and drives", Wiley-IEEE Press, 2015
3. James D Halderman, "Hybrid and Alternative Fuel Vehicles", 3rd Revised edition, Pearson Education, 2012
4. Jingyu Yan , Huihuan Qian , Yangsheng Xu, "Hybrid Electric Vehicle Design and Control", McGraw-Hill Professional Publishing, 2013

13MEZ04 VALUE ENGINEERING
(Common to All Branches except Mechanical Engineering)

L	T	P	C
3	0	0	3

OBJECTIVES:

- To know the concept of value engineering and its applications.
- To get knowledge on various stages of value engineering implementation

COURSE OUTCOMES:

At the end of the course, the students will be able to,

CO1: Identify and prioritize functions of the products.

CO2: Apply the techniques of cost reduction to minimize the product cost by maintaining the required performance

UNIT I : VALUE AND FUNCTION

(9)

Seven types values - economic value - cost, use, esteem and exchange values - mathematical model of value - types and levels of functions - function identification - method of finding functions of a product - case study - vocabulary of verbs and nouns

UNIT II : COST AND WORTH

(9)

Cost and price - elements of cost - direct material, direct labour, direct expenses, overheads - calculation of cost - case study - method of determining function cost - evaluation of worth - guidelines to find out worth - value gap and value index

UNIT III : VALUE ENGINEERING TECHNIQUES

(9)

Brainstorming and Gordon techniques - feasibility ranking - morphological analysis technique - ABC analysis - probabilistic approach - make or buy - function-cost-worth analysis - FAST - weighted evaluation method - evaluation matrix - life cycle cost

UNIT IV : TEAM DYNAMICS AND JOB PLAN

(9)

Team structure - team building - physical, intellectual, spiritual transformations - job plan - orientation phase – information phase - function phase - creative phase - evaluation phase - recommendation phase - implementation phase - audit phase

UNIT V : FINANCIAL ASPECTS AND HUMAN RELATION

(9)

Break-even point - payback period - return on investment - discounted cash flows - balance sheet and profit and loss account - human aspects in value engineering - individual ego states - techniques of transactions - human interactions - Managerial grid

TOTAL : 45 PERIODS

TEXT BOOK:

1. Mukhophadhyaya A K, “Value Engineering”, Sage Publications Pvt. Ltd., New Delhi, 2003

REFERENCES:

1. Mukhophadhyaya A K, “Value Engineering Mastermind”, Sage Publications Pvt. Ltd., New Delhi, 2009
2. Richard J Park, “Value Engineering – A plan for inventions”, St.Lucie Press, London, 1998.
3. Larry W Zimmesman. P E , “VE –A Practical approach for owners designers and contractors”, CBS Publishers, Delhi, 1992
4. Arthus E Mudge, “Value Engineering”, McGraw Hill book company, 1971

Approved by third Academic council

GROUP II OPEN ELECTIVES LIST

13GEZ01- SUSTAINABLE DEVELOPMENT

(Common to All branches)

L	T	P	C
2	0	0	2

OBJECTIVES:

- To understand the principle of sustainable development and resource degradation.
- To know the concepts of international contribution on sustainable engineering & legal system in sustainable development.
- To gain knowledge on public participation on economic growth and resource protection management.

COURSE OUTCOMES:

At the end of the course, the students will be able to,

- CO1: Know the principle of sustainable development and resource degradation.
- CO2: Know the concepts of legal system in sustainable development.
- CO3: Gain knowledge on international contribution on sustainable engineering.
- CO4: Identify the public participation on economic growth.
- CO5: Understand the approach on resource protection and management.

UNIT I : PRINCIPLES OF SUSTAINABLE DEVELOPMENT (6)

History and emergence of the concept of Sustainable Development – Definitions – Environmental issues and crisis – Resource degradation – green house gases – desertification – social insecurity – Industrialization – Globalization and Environment.

UNIT II : INDIAN JUDICIARY SYSTEM & SUSTAINABLE DEVELOPMENT (6)

Judicial System in India – Induction of sustainability concepts through legal systems – concepts – principles – doctrines – case laws.

UNIT III : SUSTAINABLE DEVELOPMENT AND INTERNATIONAL CONTRIBUTION (6)

Components of sustainability – Complexity of growth and equity – International Summits – Conventions – Agreements – Trans boundary issues – Action plan for implementing sustainable development – Moral obligations and Operational guidelines.

UNIT IV : SOCIO-ECONOMIC SUSTAINABLE DEVELOPMENT SYSTEMS (6)

Socio-economic policies for sustainable development – Strategies for implementing eco-development programmes – Sustainable development through trade – Economic growth – Carrying Capacity – Public participation.

UNIT V : AGENDA FOR FUTURE GLOBAL SUSTAINABLE DEVELOPMENT (6)

Role of developed countries in the sustainable development of developing countries – Demographic dynamics and sustainability – Integrated approach for resource protection and management.

TOTAL: 30 PERIODS

REFERENCES:

1. Kirkby, J., O' Keefe, P. and Timberlake, Sustainable Development, Earth scan Publication, London, 1996.
2. Mackenthun, K.M., Basic Concepts in Environmental Management, Lewis Publication, London, 1998.
3. Bowers, J., Sustainability and Environmental Economics – an alternative text, Longman, London, 1997.
4. Revelle CS, Whitlatch EE & Wright JR. *Civil & Environmental Systems Engineering*, 1st or 2nd Edition, Prentice Hall of India.

13GEZ02 - WASTE MANAGEMENT

(Common to All branches)

L	T	P	C
2	0	0	2

OBJECTIVES:

- To understand of the basic principles of waste and resource management will be supplemented, where appropriate, by practical problem-solving exercises.
- To provide detailed knowledge and skills in the management, treatment, disposal and recycling options for solid wastes.
- To provide details on resource efficiency plays in conserving resources and contributing to a low carbon economy.

COURSE OUTCOMES:

At the end of the course, the students will be able to,

- CO1: Understand and apply the basic for solving practical waste management challenges.
- CO2: Understand the collection of waste and recycling.
- CO3: Understand the fundamental principles of existing and emerging technologies for the treatment of waste.
- CO4: Appreciate the role of decision-making tools in the critical assessment of major waste issues.
- CO5: Understand the economy and financial aspects of waste management.

UNIT I : INTRODUCTION & TYPES OF SOURCES

(6)

Problems and need of solid and hazardous waste management - Waste management planning - Toxicology and risk assessment - Legislations on management and handling of different types of wastes.

UNIT II : WASTE GENERATION RATES

(6)

Composition - Hazardous Characteristics – TCLP tests – waste sampling- reduction of wastes at source – Recycling and reuse. Handling and segregation of wastes at source – storage and collection of municipal solid wastes – Analysis of Collection systems - Need for transfer and transport – Transfer stations -labeling and handling of hazardous wastes.

UNIT III : WASTE PROCESSING

(6)

Processing technologies – biological and chemical conversion technologies – Composting - thermal conversion technologies - energy recovery – incineration – solidification and stabilization of hazardous wastes - treatment of biomedical wastes.

UNIT IV : DISPOSAL

(6)

Site selection - design and operation of sanitary landfills - secure landfills and landfill bioreactors – leachate and landfill gas management – landfill closure and environmental monitoring – landfill remediation

UNIT V : ECONOMY AND FINANCIAL ASPECTS

(6)

Elements of integrated waste management - Economy and financial aspects of waste management. Other Waste Types: Nuclear and Radio Active Wastes.

TOTAL: 30 PERIODS

REFERENCES:

1. Hilary Theisen and Samuel A, Vigil, George Tchobanoglous, Integrated Solid Waste Management, McGraw- Hill, New York, 1993
2. CPHEEO, Manual on Municipal Solid waste management, Central Public Health and Environmental Engineering Organization, Government of India, New Delhi, 2000
3. Michael D. LaGrega, Philip L Buckingham, Jeffrey C. E vans and Environmental Resources Management, Hazardous waste Management, Mc-Graw Hill International edition, New York, 2001.
4. Vesilind P.A., Worrell W and Reinhart, Solid waste Engineering, Thomson Learning Inc., Singapore, 2002.
5. Charles A. Wentz, Hazardous Waste Management, Second Edition, Pub: McGraw Hill International Edition, New York, 1995.

Approved by third Academic council

13GEZ03 DESIGN THINKING
(Common to All branches)

L	T	P	C
2	0	0	2

OBJECTIVES:

- To acquire Design Thinking skills.
- To learn by doing projects.
- To solve so called “wicked problems” (problems for which neither question nor answer is well defined)

COURSE OUTCOMES:

At the end of the course, the students will be able to,

CO1: Have a sense of self-efficacy & creative confidence

CO2: Know how to manage a Design Thinking workshop: Layout, roles, times and process.

CO3: Apply Design thinking tools to increase research output.

UNIT I : INTRODUCTION TO DESIGN THINKING

(6)

Overview - Use of Design Thinking – Design Process. Getting Started: Define Challenges – Create a Project Plan. Design Thinking Tools.

UNIT II : DISCOVERY

(6)

Understand the Challenge: Review the Challenge - Build your Team - Refine your Plan. Prepare Research: Identify Sources of Inspiration - Select Research Participants - Prepare For Fieldwork. Gather Inspiration: Immerse Yourself in Context - Seek Inspiration In Analogous Settings - Learn From Experts - Learn From Users.

UNIT III : INTERPRETATION

(6)

Tell Stories: Capture Your COURSEs- Share Inspiring Stories. Search for meaning: Find Themes - Make Sense of Findings - Define Insights. Frame Opportunities: Create a Visual Reminder - Make Insights Actionable.

UNIT IV : IDEATION

(6)

Generate Ideas: Prepare for Brainstorming - Facilitate Brainstorming - Select Promising Ideas - Sketch to Think. Refine Ideas - Do a Reality Check - Describe Your Idea.

UNIT V : EXPERIMENTATION AND EVOLUTION

(6)

Make Prototypes: Create a Prototype. Get Feedback: Identify Sources for Feedback - Select Feedback Participants - Facilitate Feedback Conversations - Capture Feedback COURSEs - Integrate Feedback. Track COURSEs: Define Success - Document Progress. Move Forward: Plan Next.

TOTAL: 30 PERIODS

REFERENCES:

1. <http://www.designthinkingforeducators.com/toolkit>
2. <https://hbr.org/2008/06/design-thinking>
3. <http://asimetrica.org/wp-content/uploads/2014/06/design-thinking.pdf>

13GEZ04 BIG DATA ANALYTICS
(Common to All branches)

L	T	P	C
2	0	0	2

OBJECTIVES:

- To know the fundamentals of big data analytics.
- To learn about Hadoop components and storage
- To understand Hadoop operations.
- To use Map-Reduce programming model for processing large sets of data in parallel.
- To work with tools like HBase and Hive..

COURSE OUTCOMES:

On completion of this course the student will be able to

- C01.** Identify the need for big data analytics for a domain.
- C02.** Explore Hadoop distributed system and its components.
- C03.** Install and utilize Hadoop tool.
- C04.** Design applications using Map Reducing Concepts.
Implement Big Data concepts using tools like HBase and Hive

UNIT - I BIG DATA INTRODUCTION

(6)

Introduction – Characteristics of Big Data – Various V's of Data – Data in Warehouse and Hadoop – Need of Big Data Solution – Use Cases: Patterns for Big Data Deployment, IT for IT Log Analytics, The Fraud Detection Pattern, Social Media Pattern – The Call Center Mantra – Risk –Energy Sector

UNIT - II HADOOP

(6)

History of Hadoop – Components – Distributed File System – Basics of Map Reduce – Hadoop Common Components – HDFS Shell Commands – Application Development in Hadoop – Other Hadoop Components

UNIT- III HADOOP OPERATIONS

(6)

Setting up a Hadoop Cluster – Cluster Specification – Cluster Setup and Installation – Hadoop Configuration – Case Study: Installing Apache Hadoop.

UNIT - IV MAPREDUCE

(6)

The Configuration API – Setting up the Development Environment – Writing a Unit Test With MR Unit – Running Locally on Test Data – Running on a Cluster – Anatomy of a Map Reduce Job Run – Failures – Shuffle and Sort – Task Execution

UNIT- V HBASE AND HIVE

(6)

HBASE: HBasics –Concepts – Installation – Clients – Building an Online Query Application – HBase versus RDBMS – Praxis; HIVE: Installing Hive – Running Hive – Comparison with Traditional Databases – HiveQL – Tables – Querying Data.

TOTAL: 30 PERIODS

REFERENCES:

1. Chris Eaton, Dirk Deroos et al., “Understanding Big Data: Analytics For Enterprise Class Hadoop And Streaming Data”, The McGraw-Hill Companies, 2012.
2. Tom White, “Hadoop: The Definitive Guide “, O'Reilly 2012.
3. Frank J. Ohlhorst, Big Data Analytics ,1st Edition, Wiley, 2012

13GEZ05 ROBO DESIGN
(Common to All branches)

L	T	P	C
2	0	0	2

OBJECTIVES:

- To impart knowledge about the engineering aspects of Robots and their applications.

LEARNING OUTCOMES:

At the end of the course, the students will be able to,

CO1: End effectors and sensors.

CO2: Robots cell design and programming.

CO3: Industrial application of robot

UNIT I : INTRODUCTION

(6)

Basic concepts - Robot anatomy - Manipulators - kinematics: Forward and inverse kinematics - Precision movement, robot specifications and Work volume, Types of Robot drives - Basic robot motions - Point to point control, continuous path control. Robot control - unit control system concept - servo and non-servo control of robot joints, adaptive and optimal control.

UNIT II : END EFFECTORS AND SENSORS

(6)

End effectors - classification - mechanical, magnetic, vacuum and adhesive gripper - gripper force analysis and design. Sensor devices, Types of sensors - contact, position and displacement sensors, Force and torque sensors - Proximity and range sensors - acoustic sensors - Robot vision systems - Sensing and digitizing - Image processing and analysis.

UNIT III : ROBOT CELL DESIGN

(6)

Robot work cell design and control – Safety in Robotics – Robot cell layouts – Multiple. Robots and machine interference – Robot cycle time analysis.

UNIT IV : ROBOT PROGRAMMING

(6)

Robot language classification - programming methods - off and on line programming - Lead through method - Teach pendent method - VAL systems and language, simple program.

UNIT V : INDUSTRIAL APPLICATIONS

(6)

Application of robots - Material handling - Machine loading and unloading, Assembly, Inspection, Welding, Spray painting, Mobile robot, Microbots - Recent developments in robotics- safety considerations.

TOTAL : 30 PERIODS

TEXT BOOKS:

1. Deb .S.R, “Robotics technology and flexible automation”, Tata McGraw Hill publishing company limited, New Delhi, 2010.
2. Mikell P. Groover, “Industrial Robotics Technology Programming and Applications”, McGraw Hill Co., Singapore, 2008.

REFERENCES:

1. Klafter.R.D, Chmielewski.T.A and Noggins,“Robot Engineering: An Integrated Approach”, Prentice Hall of India Pvt. Ltd., New Delhi, 2011.
2. Fu K.S, Gonzalez.R.C,& Lee, C.S.G, “Robotics control, sensing, vision and intelligence”, McGraw Hill Book Co., Singapore, Digitized 2007.
3. Craig.J.J, “Introduction to Robotics mechanics and contro”l, Addison- Wesley, London, 2008.

13GEZ06 CREATIVITY INNOVATION AND NEW PRODUCT DEVELOPMENT
(Common to All branches)

L	T	P	C
2	0	0	2

OBJECTIVES:

- The students should develop their leadership qualities and creative thinking capability in product development.

LEARNING OUTCOMES:

At the end of the course, the students will be able to,

- CO1: Improve their creativity and problem solving methods.
- CO2: Improve their knowledge in project selection.
- CO3: Understand the Patent Laws
- CO4: Know the Quality standards

UNIT I : PROJECT SELECTION

(6)

Collection of ideas and purpose of project - Selection criteria.

UNIT II : PROJECT EVALUATION

(6)

Screening ideas for new products (evaluation techniques).

UNIT III : NEW PRODUCT DEVELOPMENT

(6)

Research and new product development - Patents - Patent search - Patent laws - International code for patents - Intellectual property rights (IPR).

UNIT IV : NEW PRODUCT PLANNING

(6)

Design of proto type - testing - quality standards - marketing research - introducing new products.

UNIT V : LABORATORY

(6)

Creative design - Model Preparation - Testing - Cost evaluation - Patent application.

TOTAL: 30 PERIODS

TEXT BOOKS:

1. Harry Nystrom; Creativity and innovation, John Wiley & Sons, 1979.
2. Brain Twiss; Managing technological innovation, Pitman Publishing Ltd., 1992.
3. Paul Sloane; The leader's guide to lateral thinking skills kogan page india, 2008.

REFERENCES:

1. Harry B, Watton, "New Product Planning", Prentice Hall Inc., 1992.
2. Khandwalla, RN.,- "Fourth Eye (Excellence through Creativity) - Wheeler Publishing",Allahabad, 1992.
I.P.R. Bulletins, TIFAC, New Delhi, 1997.

L	T	P	C
2	0	0	2

- To familiarize the students about energy management and energy audit.

At the end of this course, the students will be able to

CO1:	Familiarize about forms of energy	Familiarization
CO2:	Understand energy management concepts	Understanding
CO3:	Analyze and report the outcome of energy audit	Analysis

Basics of energy and its various forms: Conventional and non-conventional sources - Different fuels and its energy contents - Renewable energy: solar energy, wind energy, bio energy, hydro energy, geothermal energy, wave energy, tidal energy and OTEC.

Energy management: various approaches, cost effectiveness, bench marking, optimization of energy requirement and maximization of system efficiencies - Fuels and energy substitution

Energy audit : need, preliminary audit, detailed audit, methodology and approach - Instruments for audit, monitoring energy and energy savings.

Evaluation of saving opportunities – Determining the savings in INR, Non-economic factors, conservation opportunities, estimating cost of implementation - Energy audit reporting: Plant energy study report, importance, effective organization, report writing and presentation.

Case study: Simple calculations of energy savings and conservation in process equipments like boilers, heat exchangers only.

TOTAL : 30 PERIODS

1. Paul. O. Callaghan., "Energy Management", McGraw-Hill Professional Publishing, 2003.
2. Albert Thumann, "Handbook of energy audits", 6th ed., The Fairmount Press, 2003.

1. Murphy.W.R and McKay.G, “Energy Management” , Butterworths, London, 2007.
2. Steve Doty, Wayne C.Turner, “ Energy Management Handbook”, Fairmont Press, 7th ed., 2009.
3. Barney L. Capehart, Wayne C.Turner, William J.Kennedy, “A Guide to Energy Management”, The Fairmont Press, 6th ed., 2008.

13GEZ08 - ENERGY CONSERVATION

(Common to All branches)

L	T	P	C
2	0	0	2

COURSE OBJECTIVE:

- To enable the students to acquire the knowledge of energy conservation measures in thermal and electrical energy systems.

COURSE OUTCOMES:

At the end of this course, the students will be able to

CO1:	Under
stand the concepts of energy management	
CO2:	Meas
ure the electrical energy conservation	

UNIT I :ENERGY CONSERVATION PRINCIPLES

(6)

Energy scenario - Principles of energy conservation - Resource availability - Energy savings - Current energy consumption in India - Roles and responsibilities of energy managers in industries.

UNIT II : ENERGY CONSERVATION IN STEAM SYSTEMS

(6)

Power plant components - Conservation measures in steam systems, losses in boiler - Methodology of upgrading boiler performance - Blow down control, excess air control - Pressure reducing stations - Condensate recovery - Condensate pumping - Thermo compressor - Recovery of flash steam - Air removal and venting - Steam traps - Cooling towers.

UNIT III : ENERGY CONSERVATION IN FLUID MACHINERY

(6)

Centrifugal pumps - Energy consumption and energy saving potentials - Design consideration - Minimizing over design - Fans and blowers : specification, safety margin, choice of fans, controls and design considerations - Air compressor and compressed air systems: selection of compressed air layout, energy conservation aspects to be considered at design stage.

UNIT IV : ELECTRICAL ENERGY CONSERVATION

(6)

Potential areas for electrical energy conservation in various industries: conservation methods, energy management opportunities in electrical heating, lighting system, cable selection - Energy efficient motors - Factors involved in determination of motor efficiency - Adjustable AC drives - Variable speed drives - Energy efficiency in electrical system.

UNIT V : ENERGY MANAGEMENT

(6)

Organizational background desired for energy management persuasion – Motivation - Publicity role - Tariff analysis - Industrial energy management systems energy monitoring - Auditing and targeting - Economics of various energy conservation schemes – Energy policy and energy labeling.

TOTAL : 30 PERIODS

TEXT BOOKS:

- Reay.D.A, “Industrial energy conservation”, Pergamon Press, 1st ed., 2003.
- White.L.C, “Industrial Energy Management and Utilization”, Hemisphere Publishers, 2002.

REFERENCES:

- Smith.C.B, “Energy Management Principles”, Pergamon Press, 2006.
- Hamies, “Energy Auditing and Conservation; Methods, Measurements, Management and Case study”, Hemisphere, 2003.
- Trivedi. P.R and Jolka .K.R, “Energy Management”, Common Wealth Publication, 2002.

13GEZ09 LAW FOR ENGINEERS

(Common to All branches)

OBJECTIVE

L	T	P	C
2	0	0	2

- To familiarize the students with fundamental knowledge of laws that would be of utility in their profession.
- Enable the students to understand the new areas of law like IPR.

LEARNING OUTCOMES :

CO1: Evaluate and select the most desirable projects & Identify desirable characteristics of effective project managers.

CO2: Apply appropriate approaches to plan a new project.

CO3: Apply appropriate methodologies to develop a project schedule.

CO4: Develop a suitable budget for a new project & Identify important risks facing a new project.

UNIT 1 INTRODUCTION TO INDIAN CONSTITUTION (6)

Introduction to Constitution, Longest known Constitution, Preamble, Importance of Preamble, Justice, Liberty, Equality, Fraternity, Secular, Origin of Secularism.

UNIT 2 FUNDAMENTAL RIGHTS AND DUTIES (6)

Inalienable Human Rights, Fundamental Rights: Definition, Need, History, Suspension, Classification and Amendments, Fundamental Duties: General, Comparison with Directive Principles, List of Duties.

UNIT 3 INTELLECTUAL PROPERTY RIGHTS (IPR) (6)

Introduction to IPR, Main forms of IP, Copyrights, Trademarks, Patents and Designs, Protection in Foreign Countries, Protection inside Country, Patentable inventions, Process of obtaining patent - application, examination, opposition and sealing of patents, Duration of patents.

UNIT 4 COLLECTIVE BARGAINING (6)

Concept and Meaning of Collective Bargaining, Prerequisites of Collective Bargaining, Advantages and Disadvantages, Collective Bargaining in India.

UNIT 5 INDUSTRIAL AND INDIVIDUAL DISPUTE (6)

Industrial Dispute: Overview, Factum of Industrial Dispute, Parties to the Dispute, Subject Matter of the Dispute, Origin of the Dispute, Individual Dispute.

TOTAL : 30 PERIODS

TEXT BOOKS:

1. Brij Kishore Sharma (2011), Introduction to the Constitution of India, PHI Learning Private Limited.
2. S C Srivastava (2008), Industrial Relations and Labour Laws, VIKAS Publishing House Pvt Ltd.

REFERENCE BOOKS:

1. Agarwal H. O.(2008), International Law and Human Rights, Central Law Publications.
2. S.K. Awasthi & R.P. Kataria(2006), Law relating to Protection of Human Rights, Orient Publishing.
3. S.K. Kapur(2001), Human Rights under International Law and Indian Law, Central Law Agency.

13GEZ10 - ADVANCED MATHEMATICS FOR ENGINEERS
(Common to All branches)

L	T	P	C
2	0	0	2

OBJECTIVES:

The main objective of this paper is to gain familiarity with the application of statistics and graph theory. The paper is oriented towards the techniques needed to solve research problems. This paper is intended to help students to build the skill necessary to analyze the research oriented problems in their course of study.

UNIT I: STATISTICS

(6)

Linear Correlation and Regression - Curve fitting - Method of least squares - Multiple Regression.

UNIT II: DISTRIBUTIONS

(6)

Discrete and Continuous distributions: Binomial – Poisson - Geometric Distributions and Uniform – Exponential Distributions.

UNIT III: TEST OF HYPOTHESIS

(6)

Testing hypothesis Involving Means and Proportions - Small Samples t – Test and Chi Square test.

UNIT IV: GRAPH THEORY

(6)

Basic definitions in graphs, walk, path, circuits – Connected and Disconnected - Components - Euler graphs - Operations on graph.

UNIT V: TREES

(6)

Properties of Trees – Distance and Centers in a tree – Rooted and Binary trees, Spanning trees - Adjacency matrix – Incidence matrix.

TOTAL : 30 PERIODS

TEXT BOOKS

1. S.C.Gupta and V.K.Kapoor, “Fundamentals of Mathematical Statistics “, Sultan Chand & Co, 2002.
2. T.Veerarajan, “ Probability and Random Processes”, TMH,2006.
3. NarsinghDeo, “Graph Theory”, Prentice – Hall of India,2004.

REFERENCES

1. P.Kandasamy, K.Thilagavathy,K.Gunavathy,“ Probability and Random Variable and Random Processes”, S.Chand& Co Ltd, 2004.
2. V.K.Balakrishnan, ”Theory and Problems of Graph Theory”, Schaum’s Outlines, Tata McGraw-Hill Publishing Company Ltd, New Delhi,2004.

13GEZ11 - DISASTER MANAGEMENT
(Common to All branches)

L	T	P	C
2	0	0	2

OBJECTIVES:

- Develop an understanding of why and how the modern disaster manager is involved with pre-disaster and post-disaster activities
- Identify the organizations that are involved in natural disaster assistance

LEARNING OUTCOMES:

On completion of this course the students will be able to

CO1: Know the key personnel or specialists related to disaster management and associate them with the types of disasters and phases in which they are useful.

CO2: Understand the six elements of disaster management.

UNIT I : INTRODUCTION

(6)

Introduction – Disaster preparedness – Goals and objectives of ISDR Programme- Risk identification – Risk sharing – Disaster and development: Development plans and disaster management –Alternative to dominant approach – disaster-development linkages -Principle of risk partnership

UNIT II : APPLICATION OF TECHNOLOGY IN DISASTER RISK REDUCTION

(6)

Application of various technologies: Data bases – RDBMS – Management Information systems – Decision support system and other systems – Geographic information systems – Intranets and extranets – video teleconferencing. Trigger mechanism – Remote sensing-an insight – contribution of remote sensing and GIS - Case study.

UNIT III : AWARENESS OF RISK REDUCTION

(6)

Trigger mechanism – constitution of trigger mechanism – risk reduction by education – disaster information network – risk reduction by public awareness

UNIT IV : DEVELOPMENT PLANNING ON DISASTER

(6)

Implication of development planning – financial arrangements – areas of improvement – disaster preparedness – community based disaster management – emergency response.

UNIT V : SEISMICITY

(6)

Seismic waves – Earthquakes and faults – measures of an earthquake, magnitude and intensity – ground damage – Tsunamis and earthquakes

TOTAL: 30 PERIODS

TEXT BOOKS:

1. Pardeep Sahni, Madhavi malalgoda and ariyabandu, “Disaster risk reduction in south asia”, PHI
2. Amita sinvhal, “Understanding earthquake disasters” TMH, 2010.

REFERENCES

1. Pardeep sahani, Alka Dhameja and Uma medury, “Disaster mitigation: Experiences and reflections”, PHI

13GEZ12 - INDUSTRIAL PSYCHOLOGY
(Common to All branches)

L	T	P	C
2	0	0	2

OBJECTIVES:

- To develop an awareness of the history and major perspectives underlying and driving the field of Industrial and Organizational (I/O) Psychology.
- To develop an understanding for the potential I/O Psychology has for society and organizations now and in the future.

LEARNING OUTCOMES:

On completion of this course the students will be able to

CO1: Understand and work effectively with a diversity of individuals and groups.

CO2: Apply theory and research to contemporary problems.

UNIT I : INTRODUCTION (5)

Introduction to Industrial Psychology – Definitions & Scope. Major influences on industrial Psychology- Scientific management and human relations schools Hawthorne Experiments

UNIT II : INDIVIDUAL IN WORKPLACE-I (5)

Motivation and Job satisfaction, stress management. Organizational culture, Leadership & group dynamics.

UNIT III : INDIVIDUAL IN WORKPLACE-II (5)

Performance Management: Training & Development.

UNIT IV : WORK ENVIRONMENT & PSYCHOLOGY (7)

Work Environment & Psychology-fatigue. Boredom, accidents and safety. Job Analysis, Recruitment and Selection – Reliability & Validity of recruitment tests

UNIT V: DYNAMICS OF INDUSTRIAL BEHAVIOUR (8)

Organizational culture and climate – Factors affecting organizational climate – Importance. Job satisfaction – Determinants – Measurements – Influence on behavior. Organizational change – Importance – Stability Vs Change – Proactive Vs Reaction change – the change process – Resistance to change – Managing change. Stress – Work Stressors – Prevention and Management of stress – Balancing work and Life. Organizational development – Characteristics – objectives –. Organizational effectiveness Developing Gender sensitive workplace

TOTAL: 30 PERIODS

REFERENCES:

1. Miner J.B. (1992) Industrial/Organizational Psychology. N Y : McGraw Hill.
2. Blum & Naylor (1982) Industrial Psychology. Its Theoretical & Social Foundations CBS Publication.
3. Aamodt, M.G. (2007) Industrial/Organizational Psychology : An Applied Approach (5th edition) Wadsworth/Thompson : Belmont, C.A.
4. Aswathappa K. (2008). Human Resource Management (fifth edition) New Delhi : Tata McGraw Hill.

13GEZ13 PROJECT MANAGEMENT
(Common to All branches)

L	T	P	C
2	0	0	2

OBJECTIVES:

- To know stages of project management in an organization
- To understand the roles and responsibilities of a project manager

COURSE OUTCOMES:

At the end of the course, the students will be able to,

CO1: Demonstrate the skill set of a project manager

CO2: Apply project management concepts by identifying and carrying out a real time project

UNIT I : PROJECTS, PROJECT MANAGEMENT AND PROJECT MANAGER (6)

Project Management - process context - interpersonal and behavioral context - organizational context - defining project success - responsibilities of project manager - common challenges expected to face - skill requirements and functional competencies - unofficial job duties - value of introspection and self awareness to the soft side

UNIT II : PROJECT DEFINITION, EFFECTIVE TEAM BUILDING (6)

Evolution of projects - understanding the problem - identification of optimum solution - development of solution and preliminary plan - formal launching of project - evaluation of political environment - mechanics of building a team - team leadership - fostering teamwork and synergism - getting the most from team members

UNIT III : PROJECT PLANNING, RISK AND UNCERTAINTY (6)

Project Planning - estimating - scope management - time management - cost management - project management software - understanding risk and uncertainty - managing risk - identifying what can hurt you - quantifying how badly you can get hurt - analyzing the biggest threats - responding to high-threat problems - accommodating uncertainty

UNIT IV : PROJECT CONTROL AND INTERFACES (6)

Project Control - Establishing a Baseline of Measurement - Information Needs - Information Gathering - ensuring Good Information - Analyzing the Information - Reacting to the Information - Project Interfaces - Roles of Internal Stakeholders and External Stakeholders - Other Interfaces - Considerations in Interface Management

UNIT V : PROJECT COMMUNICATION, DOCUMENTATION AND CONCLUSION (6)

Configuration plan - documentation and communication road map - methods of communicating - guidelines for effective communication - conducting high quality meetings - communication skills - key project documentation - early termination - key elements in project closure - punch list approach - project completion checklist

TOTAL : 30 PERIODS

TEXT BOOK:

1. Gary R. Heerkens, "Project Management", 2nd ed., McGraw-Hill Book Company , 2013

REFERENCES:

1. Harold Kerzner, "Project Management", 10th ed., Wiley India Pvt Ltd., 2013
2. John M Nicholas, Herman Steyn, "Project Management for Engineering, Business and Technology", Routledge Publications, 2012
3. Prasanna Chandra, "Projects : Planning, Analysis, Selecting, Financing, Implementation and Review", 7th ed., Tata McGraw Hill Education Private Ltd., 2009
4. Clifford F Gray, Eric W Larson, Gautam V Desai, "Project Management: The Managerial Process", 4th ed., Tata McGraw Hill Education Private Ltd., 2011

13GEZ14 QUALITY MANAGEMENT AND ECONOMICS

(Common to All branches)

L	T	P	C
2	0	0	2

OBJECTIVES:

- To know the stages of quality management in an organization and economic aspects
- To understand the roles and responsibilities of an engineer in quality management.

COURSE OUTCOMES:

At the end of the course, the students will be able to,

CO1: Demonstrate the skill set of engineer in quality management

CO2: Apply quality management concepts in an organization for process improvement

UNIT I : ORGANIZING AND PLANNING FOR QUALITY

(6)

Categorizing duties - breaking categories into classifications - basic functional structure - authority, accountability and responsibility - authority principles - revise and adjust - communication - planning for quality - objectives - setting business metrics - planning - business quality, process and product quality, project, product verification and validation - policies, procedures and objectives - forms and records - blueprints - process flowcharting

UNIT II : CONTROLLING, STAFFING, MOTIVATING FOR QUALITY

(6)

Introduction - organizational responsibility - role of quality management - quality report - activity reporting - journalizing procedure - posting - product performance reporting - analysis - controlling nonconformance identification - segregation - disposition - CAPA methodology - forecasting human resources needs - job descriptions - education and training - lead, coach and guide - leadership styles - rewards based upon performance-praise and censure fairly - motivating environment

UNIT III : SPECIAL TOPICS IN QUALITY

(6)

Overview of statistical methods - risk analysis - reliability engineering - systems analysis - auditing - audit planning and scheduling - sampling plans - audit implementation steps - notification to auditee - opening meeting information, verification and evaluation - audit observations - audit supervision - audit follow up - preparation of the report - content of the report - reporting the audit - cost of quality

UNIT IV : INTRODUCTION TO ECONOMICS AND MARKET EFFICIENCY

(6)

Ten principles of economics - people's interest and decision making - interaction of people - economy - Thinking like an economist - economist as scientist - economist as policy advisor - why economists disagree - consumers, producers and efficiency of markets - consumer and producer surplus - market efficiency - Supply, demand and government policies - controls on prices, taxes, subsidies

UNIT V : SUPPLY AND DEMAND

(6)

Market forces of supply and demand - markets and competition - demand - supply - supply and demand together - elasticity and its applications - the theory of consumer choice - standard economic model, budget constraint, preferences, optimization, Consumer behavior - firms in competitive markets - production and costs - various measures of cost - Costs in the short run and in the long run - competitive market - profit maximization

TOTAL : 30 PERIODS

TEXT BOOKS:

1. Peter D. Mauch, "Quality Management", CRC Press, 2010
2. Gregory Mankiw N and Mark P. Taylor, "Economics", 3rd ed., Cengage Learning, 2010

Approved by third Academic council

REFERENCES:

1. David Hoyle, "Quality Management Essentials", 1st ed., Elsevier, 2007
2. Mohamed Zairi, Total Quality Management for Engineers", Wood Head publishing Limited, 1991
3. Irvin B. Tucker, "Economics for Today", 7th ed., Cengage Learning, 2011

LANGUAGE ELECTIVES

13GEY01 HINDI LANGUAGE *(Common to All branches)*

L	T	P	C
2	0	0	2

OBJECTIVES:

- To impart knowledge in Hindi.
- To introduce the language skills, vocabulary, grammar to the students.
- To introduce themselves and initiate a conversation.
- To develop the ability among the students to read and understand small texts written in Hindi.
- To enable the students to elementary conversational skills.

COURSE OUTCOME:

On completion of this course the students will be able to

CO1: Achieve proficiency in Hindi.

CO2: Develop their different skills in Hindi language.

CO3: Develop their skills in communicative Hindi.

CO4: Express their ideas in Hindi language.

UNIT I : BASIC SOUNDS & LETTERS/LETTER-SOUNDS

(6)

Letters – Consonants & Vowels - Joining Words – Numbers - Gender.

UNIT II : GRAMMAR

(6)

Basic Grammatical Structure- Usage of Noun, Pronoun and Verb – Basic sentence Pattern – Tenses – Phrases.

UNIT III : COMPOSITION

(6)

Short story collections - Lesson – Letter Writing- Filling the blanks.

UNIT IV : READING

(6)

Poem – Short-story – Newspaper - Letters.

UNIT V: SPEAKING

(6)

Short Conversation – Self-introduction – Asking questions.

TOTAL : 30 PERIODS

TEXT/ REFERENCES BOOKS:

13GEY02 GERMAN LANGUAGE
(Common to All branches)

L	T	P	C
2	0	0	2

OBJECTIVES:

To enable students

- To introduce the language, phonetics and the special characters in German language
- To introduce German culture and traditions to the students.
- To introduce themselves and initiate a conversation..
- To develop the ability among the students to read and understand small texts written in German.
- To enable the students to elementary conversational skills.

COURSE OUTCOME:

On completion of this course the students will be able to

- CO1: Achieve proficiency in German.
- CO2: Identify German culture and traditions.
- CO3: Read and Understand the text written in German.
- CO4: Express their ideas in German.

UNIT I:

(6)

Wichtige Sprachhandlungen: Phonetics – Sich begrüßen - Sich und andere vorstellen formell / informell - Zahlen von 1 bis 1 Milliarde - verstehen & sprechen.

Grammatik: regelmäßige Verben im Präsens - “sein” und haben im Präsens - Personalpronomen im Nominativ.

UNIT II:

(6)

Wichtige Sprachhandlungen: Telefon Nummern verstehen und sprechen Uhrzeiten verstehen und sagen Verneinung “nicht und kein” (formell und informell).

Grammatik : Wortstellung – Aussagesatz – W-Frage und Satzfrage (Ja/Nein Frage) Nomen buchstabieren und notieren bestimmter und unbestimmter Artikel und Negativartikel im Nom. & Akkusativ.

UNIT-III:

(6)

Wichtige Sprachhandlungen: Tageszeiten verstehen und über Termine sprechen -Verabredungen verstehen - Aufgaben im Haushalt verstehen.

Grammatik: Personalpronomen im Akkusativ und Dativ - W-Fragen “wie, wer, wohin,wo, was usw.- Genitiv bei Personennamen - Modalverben im Präsens “können, müssen, möchten”.

UNIT IV:

(6)

Wichtige Sprachhandlungen: Sich austauschen, was man kann, muss – Bezeichnungen Lebensmittel – Mengenangaben verstehen – Preise verstehen und Einkaufszettel schreiben

Grammatik: Wortstellung in Sätzen mit Modalverben – Konnektor ”und” – “noch”- kein-----mehr – “wie viel, wie viele, wie alt, wie lange” –Possessivartikel im Nominativ.

UNIT V:

(6)

Wichtige Sprachhandlungen: Freizeitanzeigen verstehen – Hobbys und Sportarten Anzeigen für Freizeitpartner schreiben bzw. darauf antworten – Vorlieben und Abneigungen ausdrücken

Grammatik: Verben mit Vokalwechsel im Präsens – Modalverben im Präsens “ dürfen, wollen und mögen- “haben und sein” im Präteritum – regelmäßige Verben im Perfekt – Konnektoren “denn, oder, aber.

TOTAL : 30 PERIODS

TEXT/ REFERENCES BOOKS

1. Studio d A1. Deutsch als Fremdsprache with CD.(Kursbuch und Sprach training).

13GEY03 JAPANESE LANGUAGE
(Common to All branches)

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OBJECTIVES:

- To help students learn the Japanese scripts.
- To make the students acquire basic conversational skills.
- To enable students to know about Japan and Japanese culture.
- To create an advantageous situation for the students to have better opportunity for employability by companies who have association with Japan.
- To enable the students to elementary conversational skills.

COURSE OUTCOME:

On completion of this course the students will be able to

CO1: Understand the Japanese scripts.

CO2: Understand the culture and traditions.

CO3: Read and Understand the text written in Japanese.

CO4: Express their ideas in Japanese in Written and Spoken form.

UNIT I:

(6)

1. Introduction to Japanese language. Hiragana Chart 1 - vowels and consonants and related vocabulary.
 2. Self introduction
 3. Grammar – usage of particles wa, no, mo and ka and exercises
 4. Numbers (1-100)
 5. Kanji – introduction and basic kanjis – naka, ue, shita, kawa and yama
 6. Greetings, seasons, days of the week and months of the year
 7. Conversation – audio
 8. Japan – Land and culture.
- Conversation – audio

UNIT II:

(6)

1. Hiragana Chart 1 (contd.) and related vocabulary
 2. Grammar – usage of kore, sore, are, kono, sono, ano, arimasu and imasu. Particles – ni (location) and ga. Donata and dare.
 3. Numbers (up to 99,999)
 4. Kanji – numbers (1-10, 100, 1000, 10,000 and yen)
 5. Family relationships and colours.
 6. Conversation – audio
 7. Festivals of Japan.
- Conversation – audio

UNIT III:

(6)

Hiragana Charts 2&3, double consonants, vowel elongation and related vocabulary
Grammar - particles ni (time), kara, made and ne. Koko, soko, asoko and doko.
Time expressions (today, tomorrow, yesterday, day before, day after)
Kanji – person, man, woman, child, tree and book
Directions – north, south, east and west.

UNIT IV:**(6)**

Grammar - directions,-kochira, sochira, achira and dochira. Associated vocabulary (mae, ushiro, ue, shita, tonari, soba, etc.)

Conversation – audio, Japanese art and culture like ikebana, origami, etc.

UNIT V:**(6)**

Kanji – hidari, migi, kuchi

Japanese sports and martial arts

Adjectives (present/past – affirmative and negative)

Conversation – audio

TOTAL=30 PERIODS**TEXT/ REFERENCES BOOKS**

1. First lessons in Japanese, ALC Japan