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.Tech – Information Technology [R13]

(This Curriculum and Syllabi are applicable to Students admitted from the academic year [2013-2014] to [2014-2015] only)

JUNE 2016

Approved by Fourth Academic Council

NANDHA ENGINEERING COLLEGE

(An Autonomous Institution affiliated to Anna University, Chennai)
DEPARTMENT OF INFORMATION TECHNOLOGY

Vision

Success is a joy not a destination. We promote and inspire student success by creating diverse opportunities. We have strong leadership and distinguished faculty to create enriched learning environment that empowers students to transform their lives.

Mission

Information Technology is committed to supporting and enhancing students to acquire technical expertise in the field of Information Technology, to enhance the social responsibilities of the students necessary for their successful practice of the profession and also foster the personal growth and professional excellence of all the IT staff members.

Programme Educational Objectives (PEOs)

The following Programme Educational Objectives are designed for Information Technology based on the Department Mission to provide higher education and motivate research in the field of Information Technology.

PEO 1 : To afford students with knowledge environment in mathematical, scientific and basic engineering basics necessary to evaluate, analyze and solve hardware/software engineering problems.

PEO 2 : To provide our graduates with core proficiency awareness of the life-long learning needed for a successful specialized career.

PEO 3 : To scrutinize real life problems, design and develop solutions through the knowledge of basic Computing and management principles that are publicly acceptable.

PEO 4 : To apply multifaceted skills for employment and excel in IT professional careers and/or to continue their education in IT and/or related post graduate programmes.

Programme Outcomes (POs)

Students in the Department of Information Technology programme should at the time of their graduation are in possession of:

PO1 : Basic fundamental knowledge in Mathematical Problem solving, general engineering and Electrical Sciences.

PO2 : To design system components or process to satisfy the needs of the society within realistic constrains such as economical, social, political, ethical, health, safety and manufacturing .

PO3 : Knowledge in contemporary issues and ability to analyze a problem, identify and define the Computing requirements appropriate to its solution.

PO4 : An Ability to use the techniques, skills and modern engineering tools.

PO5 : Design and Development of database system followed by ability to analyze, handle and interpret data mining Problem.

PO6 : An Ability to produce cost effective, quality and maintainable software products and solutions meeting the global standards.

PO7 : An Ability to have good programming skills, knowledge in software engineering with development and reliability testing with an overall goal of modelling.

PO8 : Knowledge in communication systems and networks.

PO9 : To inculcate, the soft skills and an ability to function on multi-disciplinary teams.

PO10: An Ability to design and develop hardware and software in emerging technology environments with required domain knowledge.

PO11 : An understanding of professional and ethical responsibilities.

PO12 : An Ability to engage in lifelong learning, higher education and involvement in research and development activity.

NANDHA ENGINEERING COLLEGE
REGULATIONS 2013 (R-13)

I to VIII - SEMESTER CURRICULUM

B.Tech – Information Technology

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
13IT301	Operating System Concepts	3	0	0	3
13IT302	Object Oriented Programming using C++	3	0	0	3
13CS303	Design & Analysis of Algorithms	3	0	0	3
13ITC01	Computer Architecture and Organization	3	0	0	3
13EC305	Analog and Digital Communication	3	0	0	3
PRACTICAL					
Course Code	**Course Title**	**L**	**T**	**P**	**C**
13IT311	Object Oriented Programming using C++ Laboratory	0	0	3	2
13IT312	Design and Analysis of Algorithm Laboratory	0	0	2	1
13CS311	Operating Systems Laboratory	0	0	2	1
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
13IT401	Database Management Systems	3	0	0	3
13IT402	Programming in Java	3	0	0	3
13IT403	Principles of Software Engineering	3	0	0	3
13IT404	Theory of Computing	3	0	0	3
13ECC01	Microprocessor & Interfacing Techniques	3	0	0	3
PRACTICAL					
Course Code	**Course Title**	**L**	**T**	**P**	**C**
13IT411	Database Management Systems Laboratory	0	0	2	1
13IT412	Programming in Java Laboratory	0	0	2	1
13ECC11	Microprocessor & Interfacing 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**
13GE401	Numerical Methods	3	1	0	4
13EC504	Signal Processing	3	0	0	3
13IT501	Computer Network Technology	3	0	0	3
13CS501	Internet and Web Programming	3	0	0	3
13GEC07	Engineering Economics and Financial Accounting	3	0	0	3
E I	Elective – I (PE)	3	0	0	3
PRACTICAL					
Course Code	**Course Title**	**L**	**T**	**P**	**C**
13IT511	Computer Network Technology Laboratory	0	0	3	2
13CS511	Internet and Web Programming Laboratory	0	0	3	2
E1L	Elective I Laboratory	0	0	3	2
13PT511	Verbal Aptitude and Reasoning – I	0	0	2	0
	TOTAL	**18**	**1**	**11**	**25**

SEMESTER VI

THEORY					
Course Code	**Course Title**	**L**	**T**	**P**	**C**
13IT601	Object Oriented System Design	3	0	0	3
13IT602	C# and .NET	3	0	0	3
13IT603	Computer Graphics and Multimedia	3	0	0	3
13IT604	Network Security	3	0	0	3
13IT605	Compiler Design	3	0	0	3
E2	Elective II (PE)	3	0	0	3
PRACTICAL					
Course Code	**Course Title**	**L**	**T**	**P**	**C**
13IT611	Mini Project	0	0	2	1
13IT612	C#.NET Laboratory	0	0	3	2
13IT613	Computer Graphics and Multimedia Laboratory	0	0	3	2
13GE611	Comprehension	0	0	2	1
13PT611	Verbal Aptitude and Reasoning – II	0	0	2	0
	TOTAL	**18**	**0**	**12**	**24**

SEMESTER VII

THEORY					
Course Code	**Course Title**	**L**	**T**	**P**	**C**
13IT701	Software Testing	3	0	0	3
13IT702	Mobile Communication	3	0	0	3
13IT703	Cloud Computing	3	0	0	3
E 3	Elective – III (PE)	3	0	0	3
E 4	Elective – IV (OE)	3	0	0	3
E 5	Elective – V (OE)	2	0	0	2
PRACTICAL					
Course Code	**Course Title**	**L**	**T**	**P**	**C**
13IT711	Software Testing Laboratory	0	0	3	2
13IT712	Cloud Computing Laboratory	0	0	3	2
13GE711	Personality and Character Development	0	0	2	0
	TOTAL	**18**	**0**	**8**	**21**

SEMESTER VIII

THEORY					
Course Code	**Course Title**	**L**	**T**	**P**	**C**
E6	Elective V (PE)	3	0	0	3
E 7	Elective VII (OE)	2	0	0	2
PRACTICAL					
Course Code	**Course Title**	**L**	**T**	**P**	**C**
13IT831	Project Work	0	0	20	10
	TOTAL	**5**	**0**	**20**	**15**

Professional Electives Laboratory (PE) :

LIST OF ELECTIVES FOR E1 L					
Course Code	**Course Title**	**L**	**T**	**P**	**C**
13ITW01	Advanced Database Management System Laboratory	0	0	3	2
13ITW02	Distributed And Object Oriented Database Laboratory	0	0	3	2
13ITW03	Open Source Database Laboratory	0	0	3	2
13ITW04	Relational Database Management System Using DB2 Laboratory	0	0	3	2

LIST OF PROFESSIONAL ELECTIVES

B.Tech. Information Technology

LIST OF ELECTIVES FOR E1					
Course Code	**Course Title**	**L**	**T**	**P**	**C**
13ITX01	Advanced Database Management System	3	0	0	3
13ITX02	Distributed and Object Oriented Database	3	0	0	3
13ITX03	Open Source Database	3	0	0	3
13ITX04	Relational Database Management system using DB2	3	0	0	3
LIST OF ELECTIVES FOR E2 (Industry)					
Course Code	**Course Title**	**L**	**T**	**P**	**C**
13ITX05	Composing Mobile Apps	3	0	0	3
13ITX06	Building Enterprise Applications	3	0	0	3
13ITX07	Business Intelligence – Data Warehousing & analytics	3	0	0	3
LIST OF ELECTIVES FOR E3					
Course Code	**Course Title**	**L**	**T**	**P**	**C**
13ITX08	Programming with ASP.NET	3	0	0	3
13ITX09	Programming with JAVA 2 Enterprise Edition	3	0	0	3
13ITX10	Programming with Python	3	0	0	3
13ITX11	Programming with PHP	3	0	0	3
LIST OF ELECTIVES FOR E6					
Course Code	**Course Title**	**L**	**T**	**P**	**C**
13ITX12	Information Storage Management	3	0	0	3
13GEC03	Professional Ethics and Human Values	3	0	0	3
13CSX11	Human Computer Interactions	3	0	0	3
13ECX09	High Speed Networks	3	0	0	3
13ITX13	Ethical Hacking	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

LIST OF TWO CREDIT LANGUAGE ELECTIVES *

THEORY					
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+25+24+21+15) = 184 CREDITS

***PE- Professional Elective *OE-Open Elective**

SEMESTER I
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 sensitise 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 vide 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

REFERENCES :

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

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 Involutes-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 Ultrasonics 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 - CO_2 laser - semiconductor laser (homojunction & Hetrojunction). 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 - 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 CRYSTALOGRAPHY (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. NewDelhi,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		

Approved by Fourth Academic Council

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

L	T	P	C
3	0	0	3

OBJECTIVES :

- 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 squad 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 SOMETRIC, 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.

REFERENCES :

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
2. Practices Laboratory”, Anuradha Publications ,2007.
3. 2.T Jeyapoovan, M Saravanapandian and S Pranitha, “Engineering Practices Lab Manual”, Vikas Puplishing House Pvt.Ltd, 2006.
4. H S Bawa, “Workshop Practice”, Tata McGraw - Hill Publishing Company Limited, 2007.
5. A Rajendra Prasad and P.M.M.S Sarma., “Workshop Practice”, Sree Sai Publication, 2002.
6. 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

7. 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.

REFERENCES :

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

1. Apply knowledge of Mathematics in Engineering.
2. Communicate problem solutions using correct Mathematical terminology.
3. 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 2^{nd} 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", 5^{th} ed., Laxmi Publications,2011.
2. T Veerarajan, "Engineering Mathematics for first year", 3^{rd} ed., Tata McGraw Hill , 2011.
3. P Kandasamy, K Thilagavathy and K Gunavathy ., "Engineering Mathematics for first year", 7^{th} Rv. ed., S.Chand & Co Ltd ,2010.

REFERENCES:

1. B.S.Grewal, "Higher Engineering Mathematics", 40^{th} ed., Khanna publications, 2007.
2. Erwin Kreyszig, "Advanced Engineering Mathematics", 8^{th} 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 conductions, 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 - Wiedemann-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 Tc 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 polarisation - 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 constitutes 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", 8 th ed.,Sri Krishna Hitech publishing Co.Pvt .Ltd., 2012.

REFERENCES :

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

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

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
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

13CS211- DATA STRUCTURES LABORATORY
(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 complier.
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:

1. Verification of Boolean Theorems using basic gates.
2. Design and implementation of combinational circuits using basic gates for arbitrary functions, code converters.
3. Design and implementation of combinational circuits using MSI devices:
   - 4 - bit binary adder / subtractor
   - Parity generator / checker
   - Magnitude Comparator
   - Application using multiplexers
4. Design and implementation of sequential circuits:
   - Shift -registers
   - Synchronous and asynchronous counters
5. Coding combinational / sequential circuits using HDL.
6. 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

SEMESTER III

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

13IT301- OPERATING SYSTEM CONCEPTS

OBJECTIVE:

L	T	P	C
3	0	0	3

- To learn how an operating system performs its duties is to garner insight into how a computer functions at its innermost levels.

COURSE OUTCOMES:

At the completion of the course,

CO1: Design various Scheduling algorithms.

CO2: Apply the principles of concurrency.

CO3: Design deadlock, prevention and avoidance algorithms.

CO4: Compare and contrast various memory management schemes.

CO5: Design and Implement a prototype file systems.

UNIT I FUNDAMENTALS (9)

Overview: Role and purpose of operating systems; history of operating system development; functionality of a typical operating system; design issues (efficiency, robustness, flexibility, portability, security, compatibility). **Basic principles:** Structuring methods; abstractions, processes, and resources; design of application programming interfaces (APIs); device organization; interrupts; user/system state transitions.

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.

UNITIV 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. CassStudy:Linux, Windowsand Android.

TOTAL : 45 PERIODS

TEXT BOOK:

1. Silberschatz, P.B.Galvin & G.Gagne, "Operating system concepts," JohnWiley,8th e,2011.

REFERENCE :

1. W. Stallings, "Operating systems," Prentice-Hall, 7th ed,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	x			x				x	x
2					x							
3				x						x	x	
4		x		x								
5					x		x				x	

13IT302- OBJECT ORIENTED PROGRAMMING USING C++

L	T	P	C
3	0	0	3

OBJECTIVE:

- To introduce the salient features of Object Oriented Programming, with focus on generic programming with templates and Exception Handling.

COURSE OUTCOMES:

Upon completion of this course the students will able to

CO1: Analyze and design a computer program to solve real world problems based on object-oriented principles.

CO2: Construct real world entity using object initialization.

CO3: Examine the program scenario in different situations.

CO4: Create reusable system components.

CO5: Predict runtime error using exception handling.

UNIT I INTRODUCTION TO FUNDAMENTAL CONCEPTS (9)

Object oriented fundamentals- Structured versus object-oriented development, elements of object oriented programming, fundamentals of OO-class, object, and abstraction and its importance, encapsulation, polymorphism, benefits of OOP, structure of object oriented program.

UNIT II CLASSES AND OBJECT (9)

Working with classes- Classes and Objects- Class specification, class objects, accessing class members, defining member functions, inline functions, accessing member functions within class, data hiding, class member accessibility, empty classes, constructors, parameterized constructors, constructor overloading, copy constructor, new, delete operators, "this" pointer, friend classes and friend functions.

UNIT III OVERLOADING (9)

Function overloading– Operator overloading- Non- overloadable 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 (9)

Inheritance- Base class and derived class relationship, derived class declaration, Forms of inheritance, inheritance and member accessibility, constructors in derived class, destructors in derived class, constructor invocation and data member initialization, data conversion, abstract classes, virtual base classes, virtual functions.

UNIT V EXCEPTION HANDLING AND FILES (9)

Files and Streams-Opening and Closing a file, file modes, file pointers and their manipulation, sequential access to a file, ASCII and binary files, random access to a file, error handling during file manipulations, Exception handling-exception handling model, exception handling constructs, lists of exceptions, catching exceptions, handling exceptions.

TOTAL : 45 PERIODS

TEXT BOOK:

1. K.R.Venugopal, Rajkumar,T.Ravishankar,"Mastering C++," 4th ed, TataMcGraw Hill,2008

REFERENCES :

1. Herbert Schildt " Java: The complete reference J2SE 5th ed," Tata McGraw-Hill , 2005
2. Bjarne stroustrup, "The C++ programming Language," Addison Wesley, 3rd ed, 1988.
3. Cay S.Horstmann and Gray Carnell, " Core Java Volume I –Fundamentals," The sun Microsystems Press Java Series,2000.

Mapping of Course Outcome and Programme Outcome

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
4			x	x		x	x			x		x
5			x			x	x			x		x

13CS303 -DESIGN AND ANALYSIS OF ALGORITHMS

(For CSE & IT Branches)

L	T	P	C
3	0	0	3

OBJECTIVE:

- To learn the development of efficient algorithms for computational tasks and reasoning about the correctness of the algorithm.

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 DCREASE- 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. AnanyLevitin, "Introduction to the Design and Analysis of Algorithm," Pearson Education Asia, 3rd ed, 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
2	x	x	x	x							x	x
3	x	x	x	x				x	x		x	
4	x	x	x	x				x	x		x	x
5		x	x		x			x	x		x	x

13ITC01 - COMPUTER ARCHITECTURE AND ORGANIZATION

L	T	P	C
3	0	0	3

OBJECTIVES :

- To Gain an understanding of computer data representation and manipulation.
- To understand the basic organization for data storage and access across various media.
- To provide knowledge of interfacing techniques and subsystem devices.

COURSE OUTCOMES:

A student who successfully completes the course will have the ability to

CO1: Understand the fundamentals of computer architecture.
CO2: Learn the working of data representation and arithmetic operations.
CO3: Understand the organization of memory and memory management hardware.
CO4: Describe the operations and languages of Input – Output organization.
CO5: Elaborate advance concepts of storage systems, processor to network interface.

UNIT I FUNDAMENTALSOF 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 over head, 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; Video control; I/O Performance; SMART technology and fault detection; Processor to network interfaces.

TOTAL :45 PERIODS

TEXT BOOK:

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

REFERENCES :

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

Mapping of Course Outcome and Programme Outcome

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
5	x			x	x			x		x		x

13EC305-ANALOG AND DIGITAL COMMUNICATION

(For CSE & IT Branches)

L	T	P	C
3	0	0	3

OBJECTIVES:

- To have understanding about different types of Communication systems.
- 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, Super heterodyne 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 ,G Saha , “Principles of Communication,” 3/e,2007.
2. Bernard Sklar,”Digital Communication: fundamentals and applications,” Addision 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,” 6/e, 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	

13IT311- OBJECT ORIENTED PROGRAMMING USING C++ LABORATORY

L	T	P	C
0	0	3	2

OBJECTIVES:

- To make the students learn object oriented way of solving problems.
- To teach the student to write programs in C++ to solve the problems

COURSE OUTCOMES:

On completion of this course the students will be able to

CO1: Improve their programming skill.
CO2: Apply object oriented technology for application development.
CO3: Understand the different types of polymorphism and their usage.
CO4: Develop the program on reusing the components.
CO5: Construct the program by importing or exporting the data from files.

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 on abstract class and create many derived classes Such as Engg. Science, Medical, etc. from students 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)
11. Write a program to implement STL.

TOTAL: 45 PERIODS

Mapping of Course Outcome and Programme Outcome

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		x
3			x		x		x					x
4			x			x	x			x		
5			x			x	x					

13IT312-DESIGN AND ANALYSIS OF ALGORITHMS LABORATORY

L	T	P	C
0	0	2	1

OBJECTIVES:

- To develop algorithms for sorting, searching, insertion and matching.
- To identify and apply the concept of computational intractability.

COURSE OUTCOMES:

On completion of this course the students will be able to

CO1: To synthesize efficient algorithms in common engineering design situations .
CO2: To understand the case efficiency of an algorithm
CO3: To know the ways of estimating time speed for different algorithms.
CO4: To study about applications of the different algorithms.
CO5: To know about the various tools available for analyzing algorithms.

LIST OF EXPERIMENTS

1. Comparing each item in the list with the item next to it, and swapping them if required & it inserts each item into its proper place in the final list. The simplest implementation of this requires two list structures - the source list and the list into which sorted items are inserted.
2. Write a Binary Search Algorithm using recursion and non recursion method.
3. Find Minimum Cost Spanning Tree of a given undirected graph using Kruskal's algorithm &Prim's algorithm.
4. Implement 0/1 Knapsack problem
5. All-Pairs Shortest Paths Problem using Floyd's algorithm. Parallelize this algorithm, implement it and determine the speed-up achieved.
6. Show N Queen's problem using Back Tracking where the value of N is 8.
7. Implementation of Graph Coloring using Back Tracking algorithm
8. From a given vertex in a weighted connected graph, find shortest paths to other vertices using Dijkstra's algorithm
9. Implement any scheme to find the optimal solution for the Traveling Salesperson problem and then solve the same problem instance using any approximation algorithm.

TOTAL HOURS: 45 PERIODS

Mapping of Course Outcome and Programme Outcome

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
4						x				x		
5			x				x					

13CS311 - OPERATING SYSTEMS LABORATORY

L	T	P	C
0	0	2	1

OBJECTIVE:

- 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
3	x	x	x	x								x
4	x	x	x	x	x		x					x
5	x	x	x			x						x

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 Articulation & Word Usage Content Validity Participation in team	(a) (b) (c) (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

SEMESTER IV

13GE403 PROBABILITY AND QUEUEING THEORY
(Common to all 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.

COURSE OUTCOMES:

A student who successfully completes the course will have the ability 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: Acquire skills in handling situations involving more than one random variable and functions of random variables.

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

CO5: Have grasped the concept of Partial correlation , multiple correlation, regression analysis.

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 PROCESSANDMARKOV 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.Ibe, C. Oliver, "Fundamentals of Applied Probability and Random Processes," Elsevier, New Delhi, 2005.

2.Gross, Donald and Harris, M. Carl, "Fundamentals of Queuing Theory," 3rd ed., Wiley Publications, New Delhi, 1998.

3. Veerarajan.T, "Probability, Statistics and Random Processes," 2nd ed Tata McGraw-Hill, New Delhi, 2008.

4.S.C.Gupta&V.K.Kapoor, "Fundamentals of Mathematical Statistics," 10th ed, Aug 2000, Sultan chand & Sons, New Delhi.

REFERENCES:

1.Allen, O. Arnold, "Probability, Statistics and Queuing Theory with Computer Applications," 2nd Ed._ Elsevier, New Delhi, 1990.

2.Taha, H.A., "Operations Research - An Introduction," 8thed.Pearson Education, New Delhi, 2008.

Mapping of Course Outcome and Programme Outcome

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										x
4	x		x									x
5	x			x								x

13IT401-DATABASE MANAGEMENT SYSTEMS

L	T	P	C
3	0	0	3

OBJECTIVES:

- To teach role of data, files and databases in information systems.
- To impart knowledge of data modeling techniques.
- To provide the fundamentals of front-end and back-end of databases.

COURSE OUTCOMES:

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

CO1: Describe the role of Database Management System in an Organization.
CO2: Basic database concepts including the structure and operations of the relational data model.
CO3: Construct simple and Moderately advanced database queries using SQL.
CO4: Apply logical database design principles includes E-R diagrams & Normalization.
CO5: Explain various file organizing & Indexing structure.

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)

Data modeling; conceptual models; object-oriented model; relational data model.; Database query languages: Overview of database languages; SQL; query optimization; 4th-generation environments; embedding non-procedural queries in a procedural language; introduction to Object Query Language.

UNIT III RELATIONAL DATABASES (9)

Mapping conceptual schema to a relational schema; entity and referential integrity; relational algebra an relational calculus; Relational database design: Database design; functional dependency; normal forms; multi valued dependency; join dependency; representation theory.

UNIT IV TRANSACTION PROCESSING (9)

Transactions; failure and recovery; concurrency control.

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; database efficiency and tuning.

TOTAL : 45 PERIODS

TEXTBOOK:

1. A.Silberschatz, H.F.Korth & S.Sudershan, "Database System Concepts," McGraw Hill, 6th ed 2010.

REFERENCES :

1. R. Elmasri & S. B. Navathe, "Fundamentals of database systems," Addison Wesley, 2005.
2. C. J. Date, "An introduction to database systems," Addison Wesley,2003.
3. H. Garcia et al., "Database system implementation," Prentice Hall,2003

Mapping of Course Outcome and Programme Outcome

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
3	x		x	x	x		x			x		x
4	x	x	x		x	x	x			x		x
5	x			x	x		x					x

13IT402- PROGRAMMING IN JAVA

OBJECTIVES:

- To learn Java language syntax and programming with Java
- To do O-O programming with Java and Exception Handling
- To learn making use of packages and interfaces

COURSE OUTCOMES:

A student who successfully completes the course will have the ability to

CO1: Able to understand the basic concepts of JAVA.
CO2: Able to understand OOPs concepts with JAVA.
CO3: Understanding the advanced OOPs concepts like Inheritance, Polymorphism.
CO4: Understanding the concepts of Interfaces, Packages and Threads.
CO5: Able to design a GUI using AWT.

UNIT I JAVA PROGRAMMING LANGUAGE (10)

Introduction To Java: Features Of Java – Application – Java Programming Structure – Data Types – Tokens Keywords – Operators – Constants – Statements – Simple Java Program – Execution Environment – Garbage Collection.

UNIT II OOP WITH JAVA – I (8)

Preview Of Oops Concepts - Class – Objects – Methods – Nested Class – Constructor – finalizer –Access Control -I/O Streams – String – String Buffer – Vector – Wrapper Class – static – final –this Keyword

UNIT III OOP WITH JAVA – II (9)

Inheritance: Types Of Inheritance – Polymorphism – Method Overloading – super – Method Overriding – Exception Handling – File and I/O Streams.

UNIT IV INTERFACES, PACKAGES AND THREADS (9)

Java Interfaces, Packages, And Threads: Interfaces – Interface Design – Packages – Package Hierarchy – Threads Programming And Handling – Multi-Thread Programming.

UNIT V GUI PROGRAMMING (9)

Java GUI: Basic elements of AWT - Applet programming – Basic elements of Swing – Front-end design Events Handling – Basics of JDBC.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Ken Arnold, James Gosling, David Holmes, "The Java Programming Language 3e," A-W, 4th ed,2005.
2. CS. Horstmann, G. Cornell, "Core Java Vol I – Fundamental," Sun,9th ed ,2012.
3. Ivor Horton, "Beginning Java 2/5," Wrox,2002.

REFERENCES :

1. P. Naughton, H. Schildt, "Java The Complete Reference 4e," Tata McGraw-Hill,8th ed,2003.
2. http://java.sun.com/docs/books/tutorial
3. Deitel & Deitel, "Java How to Program," PH-India,9th ed,2011.
4. Richarson, et al, Wrox, "Professional Java," 6th ed ,2007.
5. Kim Topley, "Core Swing Advanced Programming," Pearson,1999.

Mapping of Course Outcome and Programme Outcome

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						
3						x	x					
4						x			x	x		
5			x	x		x			x	x		

13IT403 PRINCIPLES OF SOFTWARE ENGINEERING

L	T	P	C
3	0	0	3

OBJECTIVES:

- To teach the concepts of process, product and project.
- To elucidate the knowledge of requirement analysis.
- To provide the knowledge of software design and testing.
- To introduce the project management techniques.

COURSE OUTCOMES:

A student who successfully completes the course will have the ability to

CO1: Perform Requirement analysis.
CO2: Write Software Requirement Specification.
CO3: Model software system.
CO4: Perform Testing on the developed software.
CO5: Good knowledge of tools involved in software deployment.

UNIT I FUNDAMENTALS OF SE AND REQUIREMENT ENGINEERING (9)

Software Engineering Fundamentals; Software processes: Software life-cycle and process models; Process assessment models; Overview of Project Management activities; Software requirements and specifications: Requirements elicitation; Requirements analysis modeling techniques; Functional and nonfunctional requirements; User requirements, System requirements, requirement validation and software requirement specification document. Prototyping - Basic concepts of formal specification techniques.

UNIT II SOFTWARE DESIGN (9)

Fundamental design concepts and principles; Design characteristics; System Models- Context, Behavioral, Data and, Object models, Architectural design- System structuring, Control models;Structured design; Object-oriented analysis and design; User interface design; Design for reuse; Design patterns;

UNIT III SOFTWARE VALIDATION AND MAINTENANCE (9)

Fundamental design concept sand 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 PROJECT MANAGEMENT (9)

Team management – Team processes, Team organization and decision-making, Roles and responsibilities in a software team, Role identification and assignment, Project tracking, Team problem resolution; Project planning and scheduling; Software measurement and estimation techniques; Risk analysis and management; Software quality assurance; Software configuration management;

UNIT V SOFTWARE QUALITY PROCESS IMPROVEMENT (9)

Overview of +Quality management and Process Improvement; Overview of SEI- CMM, ISO 9000, CMMI, PCMM, TQM and Six Sigma; overview of CASE tools. Software tools and environments: Programming environments; Project management tools; Requirements analysis and design modeling tools; testing tools; Configuration management tools;

TOTAL : 45 PERIODS

TEXT BOOK:

1. R.S. Pressman, "Software Engineering, apractitioner'sapproach," 7th ed, McGraw Hill,2010.

REFERENCES :

1. Ian Sommer ville, "Software Engineering," 9th ed, Addison-Wesley,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			
2						x			x			
3	x								x	x		
4	x			x		x			x			
5	x					x						

13IT404 THEORY OF COMPUTATION

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 prepare students for more advanced courses in automation theory, formal languages, algorithms & logic.

COURSE OUTCOMES:

At the end of the course students should able to

CO1: Understand the essence of computing through simple computational models.

CO2: Apply these models in practice to solving problems in diverse areas such as pattern matching cryptography, and language design.

CO3: Understand the limitations of computing, the relative power of formal languages.

CO4: Inherent complexity of many computational problems of practical importance.

CO5: Design various complex languages in equivalence with compiler models.

UNIT I AUTOMATA (9)

Strings, Alphabet, Language, Operations, Finite State Machine, definitions, finite automation model, acceptance of strings and languages, on 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 Malay 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, inter conversion 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 post's correspondence problem. Turing reducibility, definition of P and NP problems, NP complete and NP hard problems

TOTAL: 45 PERIODS

TEXT BOOK:

1. J. E. Hopcroft, R. Motwani, and J. D. Ullman, “Introduction to automata theory, languages, and computation,” Addison- Wesley, 2006.

REFERENCES:

1. Krishna Murthy E.V. "introduction to theory of Computer Science," Afiiliate Easte West Press,1983.
2. Lewis H.P. & Papadimition C.H. "Elements of Theory of Computation," Prentice Hall .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		
3	x					x					x	
4		x			x			x				x
5	x			x		x				x		x

13ECC01-MICROPROCESSORS & INTERFACING TECHNIQUES

(For CSE & IT Branches)

L	T	P	C
3	0	0	3

OBJECTIVES:

- To introduce fundamentals of 8086, 80286, 80386 and Pentium processors,
- To understand different peripheral devices.
- To acquire knowledge on assembly language programs and peripheral interfacing techniques.
- To learn about architecture and design.
- To know the Multicore thread.

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.

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 PROGRAMMMING 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- Datatypes- 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 Microprocessor sand Peripherals," 2nd ed,TataMcGrawHill,2006.

REFERENCES:

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

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
4	x	x	x		x							x
5	x	x	x	x	x	x						x

13IT411-DATABASE MANAGEMENT SYSTEMS LABORATORY

L	T	P	C
0	0	2	1

OBJECTIVE:

- Improving knowledge of querying techniques and fundamental concepts of transaction processing.

COURSE OUTCOMES:

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

CO1: To design a database system effectively.
CO2: Understand & effectively explain the concept of database technologies.
CO3: Design and implement database schema for given problem domain.
CO4: Populate and query a database using SQL – DDL, DML commands.
CO5: To learn about joins, views, and various built in functions.

LIST OF EXPERIMENTS:

1. a) Create a table EMP with the following fields. EName, Eno, Salary Dept No Address Dname
   b) Insert5recordsintoEMP
   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 by10%hike iii)Delete the employees whose name is'AAA'

3. Create a table ORDER with the following fields and constraints. ORDER

ColumnName	ConstraintName	ConstraintType
Order-no	pk-order-no	PRIMARYKEY Item-name itn UNIQUE
	Qty	ck-aty CHECK (25<QTY<50)
rate-unit	Nn-rate	NOTNULL

4. UsingEx3.
   1. Dropuniqueconstraintforitem-name
   2. Disable the constraint Nn-rate
   3. Insert are cord 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. PrimaryKey DName

Modify EMP table adding a foreign key constraint on DeptNo.

i).Insert6recordsintoDept.

ii).Implement the following Join operations

a) SelfJoin
b) Equi Join
c) Non Equi Join d) Outer Join
e) NaturalJoin

10.Using EMP and DEPT ,implement all type of view techniques.

a) Rowsubsetview
b) Columnsubsetview
c) Rowcolumnsubsetview
d) Groupedview
e) Joinedview
f) Withcheckoption

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 Outcome and Programme Outcome

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
3	x		x	x	x		x			x		x
4	x	x	x		x	x	x			x		x
5	x			x	x		x					x

13IT412- PROGRAMMING IN JAVA LABORATORY

L	T	P	C
0	0	2	1

OBJECTIVES:

- To learn Java syntax and programming
- To code in Java simple and intermediate programs
- To understand OOP with Java
- To program using threads, interfaces, and packages
- To develop GUI and Applet

.

COURSE OUTCOME:

A student who successfully completes the course will have the ability to

CO1: To learn Java syntax.

CO2: To be able to develop Java application.

CO3: To apply OOPs concepts in Java Programming.

CO4: To understand the concepts of Inheritance, Polymorphism and Threads.

CO5: To develop GUI using Swing.

LIST OF EXPERIMENTS:

1. Programs on Basic Elements of Java language.
2. Programs on Operators and I/O Streams
3. Programs on Control Flow – Decision, Branch, Loop.
4. Programs to handle strings and string buffer.
5. Programs on Exception Handling.
6. Program designs on OOP in Java – classes, methods, overloading, extended classes, inheritance, polymorphism, etc.
7. GUI Design with AWT and Swing.
8. Programs on Applet Programming and Event Handling.
9. Programs Development with Interfaces, Threads, Packages.
10. Multi-threaded Programming.
11. Programs design for accessing databases.
12. 2-tier and 3-tier software development.

TOTAL : 45 PERIODS

Mapping of Course Outcome and Programme Outcome

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						
3						x	x					
4						x			x	x		
5			x	x		x			x	x		

13ECC11- MICROPROCESSORS 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: OAH, OFH, 1OH
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: 10101010_2, 11111111_2, 1100_2, 1111_2
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 $1+1/x+1/x^3+1/x^5+$ ……..
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
2	x	x	x	x								x
3	x	x	x	x	x							
4	x		x		x							x
5			x	x	x	x						x

13PT311- LANGUAGE COMPETENCY DEVELOPMENT – II **L T P C**

(COMMON TO ALL B.E/B.TECH PROGRAMMES) **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.

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.

COURSE OUTCOMES :

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 do? 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 BOOKS:

1. Wren, Martin, "High School English Grammar and Composition," 1st ed 2011, S.Chand & Company Ltd
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	10	Articulation	(a)	Average (a+b+c+d+e)
2	Debate	10	Word Usage	(b)	
3	Class Participation	5	Content	(c)	
			Listening	(d)	
			Body Language	(e)	
	Internal Total	**25**			

Final Assessment Rubrics:

Sl. No.	Evaluation Activities	Mark Allotment	Metrics		
1	Assessment Centre	35	Role delivery	(a)	Average (a+b+c+d)
			Articulation & Word Usage	(b)	
			Content Validity	(c)	
			Participation in team	(d)	
2	Written Test	40	Objective type		
	Final Total	**75**			

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

SEMESTER V

13GE401 **NUMERICAL METHODS**

L	T	P	C
3	1	0	4

OBJECTIVES:

- The course is aimed at developing the skills of engineering students in the basis of complete procedure for solving different kinds of problems occur in engineering numerically.

COURSE OUTCOMES:

A student who successfully completes the course will have the ability to:

CO1: The students would be acquainted with the basic concepts in numerical methods to solve system of equations.

CO2: When huge amounts of experimental data are involved, the methods discussed on interpolation will be useful in constructing approximate polynomial to represent the data and to find the intermediate values .

CO3: To know about numerical differentiation &integration.

CO4: The methods introduced in the solution of ordinary differential equations and partial differential equations will be useful in attempting any engineering problem.

CO5: Solve boundary value problems.

UNIT I SOLUTION OF EQUATIONS AND EIGEN VALUE PROBLEMS (9+3)

Solution of equation – Fixed point iteration: x = g(x) method – Newton's method – Solution of linear system by Gaussian elimination and Gauss - Jordon method– Iterative method – Gauss-Seidel method – Inverse of a matrix by Gauss Jordon method – Eigen value of a matrix by power method and by Jacobi method for symmetric matrix

UNIT II INTERPOLATION AND APPROXIMATION (9+3)

Lagrangian Polynomials – Divided differences – Interpolating with a cubic spine – Newton's forward and backward difference formulas.

UNIT III NUMERICAL DIFFERENTIATION AND INTEGRATION (9+3)

Differentiation using interpolation formulae – Numerical integration by trapezoidal and Simpson's 1/3 rule – Romberg's method – Two and Three point Gaussian quadrature formulae – Double integrals using trapezoidal and Simpson's rules

UNIT IV INITIAL VALUE PROBLEMS FOR ORDINARY DIFFERENTIAL EQUATIONS (9+3)

Single step methods: Taylor series method – Modified Euler method for first order equation – Fourth order Runge – Kutta method for solving first and second order equations – Multistep methods: Milne's and Adam's predictor and corrector methods.

(9+3)

UNIT V BOUNDARY VALUE PROBLEMS IN ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS

Finite difference solution of second order ordinary differential equation – Finite difference solution of one dimensional heat equation by explicit and implicit methods– One dimensional wave equation and two dimensional Laplace and Poisson equations.

TOTAL: 60 PERIODS

TEXT BOOKS:

1. Veerarajan,T. and Ramachandran, T., "Numerical Methods with programming in c",2nd Ed._ Tata McGraw-Hill, 2006.
2. Kandasamy .P,Thilagavathy .K and Gunavathy .K , "Numerical Methods – Vol:IV", S.Chand & Co. Ltd. New Delhi, 2003.

REFERENCES:

1. Gerald, C.F. and Wheatley P.O., "Applied Numerical Analysis, 7th Ed._ Pearson Education Asia, New Delhi 2006.
2. Sankar Rao k., "Numerical Methods for Scientists and Engineers", 3rd Ed._ Prentice Hall of India, New Delhi, 2007.
3. Balagurusamy, E., "Numerical Methods", Tata McGraw-Hill, New Delhi,1999.
4. Venkatraman M.K., "Numerical Methods" National Publication, New Delhi, 2000.
5. Grewal.B.S.,"Higher Engineering Mathematics",39th edition, Hanna publishers, New Delhi,2006.

Mapping of Course Outcome and Programme Outcome

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								x
4	x		x									x
5	x			x								x

13EC504 **SIGNAL PROCESSING**

L	T	P	C
3	0	0	3

COURSE OBJECTIVES:

- To review signals and systems, study DFT and FFT, discuss the design of IIR & FIR filters and study typical applications of digital signal processing.

COURSE OUTCOMES:

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

CO1: To have details of different signals.
CO2: To have details of different systems.
CO3: To study DFT & FFT.
CO4: To study the design of IIR filters.
CO5: To study the design of FIR filters.

UNIT I INTRODUCTION TO SIGNALS (9)

Signals – classification – continuous-time, discrete-time, deterministic, non-deterministic, periodic, aperiodic, even-odd, energy, power signals – elementary signals – exponential, sinusoidal, unit step, impulse, ramp – time-shifting, scaling, folding, Sampling theorem – Discrete time signals.

UNIT II INTRODUCTION TO SYSTEMS (9)

System – classification – continuous – time/discrete-time, static/dynamic, linear/non-linear, time - invariant/variant, deterministic/stochastic, causal/non - causal, stable/unstable - ime response analysis of discrete time systems-impulse response - step response.

UNIT III FAST FOURIER TRANSFORMS (9)

Introduction to DFT – Efficient computation of DFT Properties of DFT – FFT algorithms – Radix-2 and Radix-4 FFT algorithms – Decimation in Time – Decimation in Frequency algorithms –Use of FFT algorithms in Linear Filtering and correlation.

UNIT IV IIR FILTER DESIGN (9)

Structure of IIR – System Design of Discrete time IIR filter from continuous time filter – IIR filter design by Impulse Invariance. Bilinear transformation – Approximation derivatives – Design of IIR filter in the Frequency domain.

UNIT V FIR FILTER DESIGN (9)

Symmetric & Antisymteric FIR filters – Linear phase filter – Windowing technique – Rectangular, Hamming, Hanning, Blackmann windows.

TOTAL: 45 PERIODS

TEXT BOOK:

1. J.G.Proakis, D.G.Manolakis and D.Sharma, "Digital Signal Processing, Algorithms and Applications", Pearson Education, 2012.

REFERENCES:

1. P.RameshBabu, "Digital Signal Processing", 4th Edition, SciTech Publications (India) Pvt Limited, 2007.
2. Oppenheim V.A.V and Schaffer R.W, "Discrete – time Signal Processing", 2nd Edition, Prentice Hall, 2013.
3. S.K.Mitra, Digital Signal Processing, 4rh Edition, TMH, 2010.
4. Lawrence R Rabiner and Bernard Gold, "Theory and Application of Digital Signal Processing", PHI 2010.
5. http://www.ti.com/lit/ds/symlink/tms320c6713.pdf

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
4	x	x	x	x				x				x
5	x		x	x				x			x	x

13IT501 COMPUTER NETWORK TECHNOLOGY

L	T	P	C
3	0	0	3

OBJECTIVES:

- This course provides an understanding of the various principles, protocols and design aspects of Computer Networking.

COURSE OUTCOMES:

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

CO1: To Study components required to build different types of networks.
CO2: To Study functionality at each layer for given application.
CO3: To identify the functionality of each layer.
CO4: Trace the flow of information from one node to another node in the network.
CO5: Infer the network management issues.

UNIT I DATA COMMUNICATIONS (9)

Components of Network – Data Flow – Types of Connection - Networking devices : hubs , switches, gateways, repeaters, Bridges and routers, Modem and its types - Network Topologies -Categories of Network – Internetwork & Intranetwork – Protocols and its standards - ISO / OSI Reference Model -Addressing : Physical, Logical, Port & Specific addresses - Transmission Media : Guided Media and Unguided Media

UNIT II DATA LINK LAYER (9)

Data Link Layer : Duties of DLL –Types of Error - Error Correction & Detection - Framing - Flow and Error Control - Noisy Channels & Noiseless channels - Wired LAN : Ethernet –LLC and MAC - IEEE standards : 802.3,802.4 & 802.5 – Wireless LAN : IEEE 802.11 – Bluetooth.

UNIT III NETWORK LAYER (12)

Switching : Packet Switching, Datagram Approach and Virtual Circuit Networks – Logical Addressing : IPv4 – Internet Protocol :Need for Network Layer - IPv4 & IPv6 – Transition from IPv4 to IPv6 – Mapping : ARP,RARP,BOOTP & DHCP - Sub netting –CIDR,BGP –Traceroute & Ping - Routing Protocols : RIP,OSPF.

UNIT IV TRANSPORT LAYER (9)

Duties of Transport Layer - Sockets - Process to process delivery - Concepts of User Datagram Protocol(UDP) - Concepts of Transmission Control Protocol(TCP) – Congestion Control – Quality of service – Techniques to achieve QoS.

UNIT V APPLICATION LAYER (6)

Domain Name Space (DNS) –Remote Logging – Email (SMTP, MIME, IMAP,POP3) – HTTP – SNMP – FTP - WWW –Security.

TOTAL : 45 PERIODS

TEXT BOOK :

1. Behrouz A. Forouzan, “Data Communication and Networking”, 5thEdition, Tata McGraw-Hill, 2013

REFERENCES :

1. Larry L. Peterson, Bruce S. Davie, "Computer Networks: A Systems Approach",Third Edition, Morgan Kauffmann Publishers Inc., 2003.
2. James F. Kuros, Keith W. Ross, "Computer Networking, A Top-Down Approach Featuring the Internet", Third Edition, Addison Wesley, 2004.

Mapping of Course Outcome and Programme Outcome

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
4	x		x		x			x			x	x
5	x				x					x		x

Approved by Fourth Academic Council

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:

A student who successfully completes the course will have the ability to

CO1: Understand, analyze and evaluate a system using Internet/web programming concepts.
CO2: Identify and formulate and solve web related problems.
CO3: Use techniques, skills and apply algorithmic principles to design web based applications.
CO4: Understanding web based domain knowledge to design web services.
CO5: Understanding XML and SOAP technologies.

UNIT I INTRODUCTION **(9)**

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 **(9)**

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

UNIT IV SERVLETS AND JSP **(9)**

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 **(9)**

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.

REFERENCES :

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 Outcome and Programme Outcome

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
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

13GEC07 ENGINEERING ECONOMICS AND FINANCIAL ACCOUNTING

L	T	P	C
3	0	0	3

OBJECTIVES:

- To managing an Organization to describe principles of macro economics to have the understanding of economic environment of business.
- Acquire a reasonable knowledge in accounts.
- Analysis and evaluate financial statements.

COURSE OUTCOMES:

On completion of this 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. Engineering Economics and Financial Accounting, Anjali Bagad, Technical Publications 2nd Revised Edition, 2011.
2. Engineering Economics and Financial Accounting, B. Senthil Arasu, J. Praveen Paul.SchiTech Publication (India) Pvt.Ltd.

REFERENCE BOOKS:

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 Outcome and Programme Outcome

Mapping ofCOs andPOs												
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	x
5		x									x	x

13IT511 COMPUTER NETWORKS TECHNOLOGY LABORATORY

L	T	P	C
0	0	3	2

OBJECTIVES:

- To have a thorough knowledge in computer networking.
- To visualize the net working concepts in the real world.
- To understand the working & basics of the various networking protocols.

COURSE OUTCOMES:

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

CO1: Graduates will demonstrate knowledge of mathematics, science and basic engineering.
CO2: The graduates will display skills required for continuous learning and up gradation.
CO3: The graduates will be knowledge able about contemporary developments.
CO4: Implementation of the protocol with its purpose.
CO5: Understand the protocols by the protocol analyzer tool.

LISTOF EXPERIMENTS:

1. Network Layer Concepts(Identification of Network Components, Configuration of IP)
2. Implementation of Network commands.
3. Network Design for an organization.
4. Transport Layer: Datagram (UDP) socket programming.
5. Transport Layer: Stream (TCP) socket Programming.
6. Implementation of Routing and Flow Control algorithms.
7. Application Layer: SMTP and HTTP programming.
8. Experiment on packet capturing and analyzing tools.
9. A study on Network Simulator tools.

Practical Schedule:

Sl.No	Experiment	Hours
1	Network layer concepts; to be done with computer a. Identify Network devices, cables. b. Configuration of IP addresses. c. Configuration of Subnet mask. d. Configuration of Gateway. e. Setting up LAN. f. Connecting two or more different LAN with different subnet mask. g. Making computer to work like router/gateway with the help of IP address. h. Configuring devices, Router, DHCP	6
2	Implementation of Networking Commands a. Develop an application to display the path between yahoo.com server to your desktop system using TRACEROUTE. b. Create an application to execute the following operations with remote desktop computer ○ Restart ○ Shutdown	6

	○ Log off ○Ping	
3	Network Design for an organization a. Configure the star network topology that could be implemented at small organization. b. Configure the bus topology that could be implemented at school level. c. Create two different local area networks each consisting of different number of nodes using switch and hub, try to connect both the networks and visualize the packet transformation in real time. d. Create a Network of your own for an organization consisting of 750 employees and apply Sub-netting concept. e. Create a secured network (Intranet) for departments of an engineering industry with highly access prohibition to HR department.	3
4	Transport Layer: Datagram(UDP) socket programming	6
5	Transport Layer: Stream(TCP) socket Programming	6
6	Implementation of Routing and Flow Control algorithms • Configure a network with router using the Distance Vector Routing for postal service with 7 cities. • Configure a network with router using the Distance Vector Routing for getting the purchase order from different companies with minimum expenses. • Establish a network and implement stop-and-wait flow control at the data-link layer level.	3
7	Application Layer: SMTP and HTTP programming • To send e-mail from a PHP application using the System.Net.Mail API, you must configure Simple Mail Transfer Protocol (SMTP) e-mail. Configuring e-mail services tells the System. Net.Mail application programming interface (API) to which SMTP server to deliver the e-mail generated by your application. Mail can be delivered immediately, or it can be delivered to a file location on disk where it can be retrieved for delivery later. For example, a company can provide an e-mail link for sending feedback messages or for requesting information.	6
8	Experiment on packet capturing and analyzing tools • Configure the LAN with heavy traffic congestion and then implement the congestion control algorithm for the same network. Analyze the network and show that the traffic congestion has been removed from the network.	3
9	A study on Network Simulator tools • Create a scenario using the Network Simulator 3 (NS3) to configure a network structure for an organization comprising employees around 500 nos. • Create a scenario using the Network Simulator 3 (NS3) to provide communication between the departments of an institution.	6

TOTAL: 45 PERIODS

Mapping of Course Outcome and Programme Outcome

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
3			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

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:

A student who successfully completes the course will have the ability to

CO1: Understand, analyze and evaluate a system using Internet /web programming concepts.
CO2: Identify and formulate and solve web related problems.
CO3: Use techniques, skills and apply algorithmic principles to design web based applications.
CO4: Understand web server technologies such as JSP, Servlet.
CO5: Understand 3 tier applications in web programming.

LIST OF EXPERIMENTS:

HTML:

- Write a html program for Creation of web site with Forms and Controls, Frames, Links, Tables

CSS:

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

Java Script:

- 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.
- Create a script that collects numbers from a page and then adds them up and prints them to a blank field on
- the page.
- Create a script that prompts the user for the numbers and stored in array and displaying in ascending order.
- 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:

- Write a servlet program using HTTP Servlet.
- Develop an Online application with data access for displaying student's mark list using java servlet and MS-Access database.

JSP:

- Develop an Online Applications for displaying student's mark list using java server pages and MS-Access database.

JSP and Servlet:

- Write a web application that functions as a simple hand calculator, but also keeps a log of all your previous work.

3tier:

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

TOTAL: 45 PERIODS

Mapping of Course Outcome and Programme Outcome

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
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

13ITW01 ADVANCED DATABASE MANAGEMENT SYSTEM LABORATORY

L	T	P	C
0	0	3	2

OBJECTIVES:

- To learn the fundamental concepts in SQL Server.
- To learn about sub queries, triggers and procedures.
- To know how to connect SQL Server with front-end.

COURSE OUTCOMES:

On completion of this course the student will be

CO1: Able to apply practical knowledge on creation of database and perform various operations on tables.
CO2: Able to implement stored procedures and cursors.
CO3: Able to develop applications connected to SQL Server.
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. DDL & DML – data types, create, alter, drop table, integrity constraints.
2. Insert, delete and update commands.
3. DCL & TCL – grant, revoke, rollback and commit.
4. Select command using logical operators, order by, group by clause etc.
5. Join query concept .
6. Database objects – view, index, sequence – create, alter and drop.
7. Function – definition and implementation.
8. Database triggers.
9. Stored procedures.
10. Record management using cursors.
11. Develop an application using Database Connectivity.

TOTAL: 45 PERIODS

Mapping of Course Outcome and Programme Outcome

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
3		x	x	x	x	x	x	x		x	x	x
4	x	x		x	x							x
5	x	x	x	x	x		x	x	x		x	

Approved by Fourth Academic Council

13ITW02 DISTRIBUTED AND OBJECT ORIENTED DATABASE LABORATORY

L	T	P	C
0	0	3	2

OBJECTIVES:

- This laboratory course module aims to give students in depth information about system implementation techniques, data storage, representing data elements, database system architecture, the system catalog, query processing and optimization, transaction processing concepts, concurrency control techniques, database recovery techniques, database security and authorization, enhanced data models for advanced applications, temporal databases, distributed databases and client server architecture, advanced database concepts, and emerging technologies and applications.

COURSE OUTCOMES:

On completion of this course the student will be

CO1: Knowledge and understanding - Apply normalization techniques. - Understand how transactions are processed in a database & know about database security issues.

CO2: Cognitive skills (thinking and analysis). - Discuss/explain the different techniques in Concurrency control.

CO3: Tune and Optimize some Database Applications.

CO4: Practical and subject specific skills (Transferable Skills). - Carefully explain the concepts of Object-Oriented database.

CO5: Import and export the data in to the relational database management system. Database connectivity using different API.

LIST OF EXPERIMENTS:

1. Functions , Stored Procedures
2. Triggers
3. Normalization Techniques
4. Data Mining and Data warehouse
5. Transaction Processing
6. Concurrency Control
7. Managing spatial data
8. Object Query Language
9. Embedded Object Query Language
10. Data Import and Export
11. Backup configuration
12. Database access using API

TOTAL: 45 PERIODS

Mapping of Course Outcome and Programme Outcome

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
4		x		x	x		x			x		
5	x			x					x		x	x

13ITW03 **OPENSOURCE DATABASE LABORATORY**

L	T	P	C
0	0	3	2

OBJECTIVES:

- This laboratory course gives a thorough understanding of the concepts of PostgreSQL. It also gives a comprehensive understanding of using a query language.

COURSE OUTCOMES:

On completion of this course the student will be

CO1: Able to know basics in administrating the database.
CO2: Able to apply practical knowledge on creation of database and perform various operations on tables.
CO3: Able to implement stored procedures and cursors.
CO4: Able to work in various database objects like view, index.
CO5: Able to implement advanced SQL.

1. Basic SQL

- Setting up and Getting Familiar with PostgreSQL/PGAdmin3.
- Install PostgreSQL and pgadmin and configure.
- Connect to PostgreSQL using either the psql command line interface, or using pgAdmin3.
- Administering PostgreSQL and Creating Users.

2. DDL

- Data Types.
- Schema creation, Alter and deletion.
- DML.
- Insert, select, delete and update commands.

3. Intermediate SQL

- Integrity constraints
- Aggregates functions, Subquery and Joins.
- Database objects – view, index, sequence – create, alter and drop.

4.Advanced SQL

- Functions.
- Stored procedures and triggers.
- DCL & TCL – grant, revoke, rollback and commit.
- Develop a package using database connectivity.

TOTAL: 45 PERIODS

Mapping of Course Outcome and Programme Outcome

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					
5				x	x		x					

13ITW04 RELATIONAL DATABASE MANAGEMENT SYSTEM USING DB2

LABORATORY

L	T	P	C
0	0	3	2

OBJECTIVES:

- This laboratory course gives a thorough understanding of the concepts of DB2. It also gives a comprehensive understanding of using a query language.

COURSE OUTCOMES:

On completion of this course the student will be

CO1: Populate and query a database using SQL DML/DDL commands.
CO2: Declare and enforce integrity constraints on a database using a RDBMS .
CO3: Programming PL/SQL including stored procedures, stored functions, cursors.
CO4: Develop a package using database connectivity.
CO5: Design of different object and row locking technologies.

LIST OF EXPERIMENTS:

1. DDL & DML – data types, create, alter, drop table, integrity constraints.
2. Insert, delete and update commands.
3. DCL & TCL – grantÞFrevoke, rollback and commit.
4. Select command with operators like arithmetic, comparison, logical, order by, group by etc.
5. Set operations.
6. Join query concept.
7. Complex and sub queries.
8. Database objects – view, index, sequence – create, alter and drop.
9. Record management using cursors.
10. Function – definition and implementation.
11. Database triggers .
12. Develop a package using database connectivity.
13. Creating a database and table for storing XML data.
14. Object and Row Locking.

TOTAL: 45 PERIODS

Mapping of Course Outcome and Programme Outcome

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
3	x		x	x	x		x			x	x	x
4	x										x	x
5	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.

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		
4									x	x		x
5									x	x		x

SEMESTER VI

13IT601 OBJECT ORIENTED SYSTEM DESIGN

L	T	P	C
3	0	0	3

OBJECTIVES:

- Create and modify object oriented analysis and design models. To provide a brief, hands-on overview of object-oriented analysis in software process.
- To discuss Case studies based project specifications to develop object-oriented models and identify implementation strategies.
- To demonstrate and apply basic object oriented techniques.
- To understand and apply testing techniques for object oriented software.

COURSE OUTCOMES:

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

CO1: Understand the basic concepts to identify state & behavior of real world objects.
CO2: Able to learn the various object oriented methodologies and choose the appropriate one for solving the problem with the help of various case studies.
CO3: Develop a project scope, and a project plan with feasibility analysis
CO4: Understand the concept of analysis, design & testing to develop a document for the project.
CO5: Able to implement analysis, design & testing phases in developing a software project.

UNIT I INTRODUCTION (9)

An overview – Object basics – Object state and properties – Behavior – Methods – Messages – Information hiding – Class hierarchy – Relationships and Associations – Aggregations- Identity – Dynamic binding – Persistence – Meta classes – Object oriented system development life cycle.

UNIT II METHODOLOGY AND UML (9)

Survey – Rumbugh, Booch, Jacobson methods – Patterns - Frameworks – Unified approach – Unified modeling language – Static and Dynamic models – UML diagrams – Class diagram – Usecase diagrams – Dynamic modeling – Model organization – Extensibility.

UNIT III OBJECT ORIENTED ANALYSIS (9)

Identifying Use cases – Business object analysis – Use case driven object oriented analysis – Use case model – Documentation – Classification – Identifying object, relationships, attributes, methods – Super-sub class -Object responsibility.

UNIT IV OBJECT ORIENTED DESIGN (9)

Object Oriented Design Process – Axioms – Corollaries – Designing classes – Class visibility – Refining attributes – Methods and protocols – Object storage and object interoperability – Databases – Object relational systems – Designing interface objects – Macro and Micro level processes – The purpose of a view layer interface.

UNIT V QUALITY AND TESTING (9)

Quality assurance – Testing strategies – Test cases – Test Plan - Continuous Testing – Case Study: Cryptanalysis – Health Care Systems- Inventory Control System - Rational Rose Suite.

TOTAL : 45 PERIODS

Approved by Fourth Academic Council

TEXT BOOKS:

1. Ali Bahrami, "Object Oriented System Development", McGraw Hill International Edition, 2008.
2. Grady Booch, James Rumbaugh, Ivar Jacobson, "The Unified Modeling Language User Guide" , Addison Wesley Long man, 1999.

REFERENCES :

1. Craig Larman, Applying UML and Patterns, 2nd Edition, Pearson, 2002.

Mapping of Course Outcome and Programme Outcome

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
3	x			x	x			x		x		
4		x	x	x	x		x		x	x	x	x
5		x		x	x					x	x	x

13IT602 **C# and .NET**

L	T	P	C
3	0	0	3

OBJECTIVE:

- To understand the fundamental concepts of the C# language and the .NET framework.

COURSE OUTCOMES:

A student who successfully completes the course will have the ability to

CO1: List the major elements of the .NET frame work.
CO2: Explain how C# fits into the .NET platform.
CO3: Analyze the basic structure of a C# application.
CO4: Debug, compile, and run a simple application.
CO5: Develop programs using C# on .NET.

UNIT I INTRODUCTION TO C# **(9)**

Introducing C#, Understanding .NET, Overview of C#, Literals, Variables, Data Types, Operators, Expressions, Branching, Looping, Methods, Arrays, Strings, Structures, Enumerations.

UNIT II OBJECT ORIENTED ASPECTS OF C# **(9)**

Classes, Objects, Inheritance, Polymorphism, Interfaces, Operator Overloading, Delegates, Events, Errors and Exceptions.

UNIT III APPLICATION DEVELOPMENT ON .NET **(9)**

Building Windows Applications, Accessing Data with ADO.NET.

UNIT IV WEB BASED APPLICATION DEVELOPMENT ON .NET **(9)**

Programming Web Applications with Web Forms, Programming Web Services.

UNIT V THE CLR AND THE .NET FRAMEWORK **(9)**

Assemblies, Versioning, Attributes, Reflection, Viewing Meta Data, Type Discovery, Reflecting on a Type, Marshaling, Remoting, Understanding Server Object Types, Specifying a Server with an Interface, Building a Server, Building the Client, Using Single Call, Threads.

TOTAL: 45PERIODS

TEXT BOOK:

1. E. Balagurusamy, "Programming in C#", Tata McGraw-Hill, 2004.

REFERENCES:

1. J. Liberty, "Programming C#", 2nd ed., O'Reilly, 2002.
2. Herbert Schildt, "The Complete Reference: C#", Tata McGraw-Hill, 2004.
3. Robinson et al, "Professional C#", 2nd ed., Wrox Press, 2002.
4. S. ThamaraiSelvi, R. Murugesan, "A Textbook on C#", 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			
2	x								x			
3	x									x		
4	x			x		x			x			
5	x					x			x			

13IT603 **COMPUTER GRAPHICS AND MULTIMEDIA**

L	T	P	C
3	0	0	3

OBJECTIVES :

- To understand computational development of graphics with mathematics.
- To provide in-depth knowledge of display systems, image synthesis, shape modeling of 3D.
- To Understand basic concepts related to Multimedia including data standards, algorithms and application Software.
- To Experience development of multimedia software by utilizing existing libraries and descriptions of algorithms.

COURSE OUTCOMES :

A student who successfully completes the course will have the ability to

CO1: Gain proficiency in 3D computer graphics API programming.
CO2: Enhance the perspective of modern computer system.
CO3: To study modeling, analysis and interpretation of 2D & 3D visual information.
CO4: To state the properties of different media streams.
CO5: Students will demonstrate an understanding of contemporary graphics hardware.

UNIT I INTRODUCTION AND OVERVIEW OF GRAPHICS SYSTEMS (9)

Use of Computer graphics, Video Display Devices, Flat Panel Displays, Three-Dimensional Viewing Devices, Graphics Softwares.Points and Lines, Line Drawing Algorithms (DDA &Bresenham's), Circle and Ellipse Generating Algorithms, Conic Sections.

UNIT II TWO-DIMENSIONAL GEOMETRIC TRANSFORMATIONS (9)

Different types of transformations and their matrix representations, Homogeneous Coordinates, Composite Transformations, transformations between Coordinate Systems, Affine transformations, Window-to-Viewport Coordinate transformation, Clipping-Point, Line, Polygon, Curve and Text Clipping.

UNIT III THREE-DIMENSIONAL TRANSFORMATIONS AND VIEWING (9)

Translation, Rotation, Scaling, Reflection, Shears, Composite Transformations, Projections- Parallel and Perspective, Projection Transformations, Clipping.

UNIT IV MULTIMEDIA (9)

Introduction : Definition of multimedia - Multimedia Basics - Where to use Multimedia - Multimedia Elements – Multimedia Applications - Virtual Reality – Delivering Multimedia. Multimedia Systems Architecture**:** Multimedia Workstation Architecture - High resolution Graphic displays - Multimedia Architecture Based on interface bus - Network architecture for Multimedia systems.

UNIT V MAKING MULTIMEDIA **(9)**

The Stages of a Multimedia Project – Creativity - Organization, Communication - Hardware - Software - Text Editing and Word Processing Tools - OCR Software - Painting and Drawing Tools, 3-D Modeling and Animation Tools - Image- Editing Tools - Sound-Editing Tools - Animation, Video, and Digital Movie Tools, Authoring Systems - Making Instant Multimedia - Types of Authoring Tools.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. D. Hearn & M.P. Baker - Computer Graphics, 2/e , Pearson Education, New Delhi, 2005.
2. Prabat K Andleigh and KiranThakrar, "Multimedia Systems and Design", PHI, 2005

REFERENCES:

1. W.M. Newman. et. al.- Principle of Interactive Computer Graphics, McGraw Hill Publication, New Delhi, 1995.
2. S.Harrington -Computer Graphics- A Programming Approach, McGraw Hill Publication, New Delhi, 1994.
3. J.D. Foley et. al- A Fundamental of Computer Graphics Addition Wesley, London, 1993.

Mapping of Course Outcome and Programme Outcome

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
3		x	x	x	x		x	x		x		
4	x	x	x	x		x	x		x			x
5		x	x	x	x		x	x		x		

13IT604 **NETWORK SECURITY**

L	T	P	C
3	0	0	3

OBJECTIVES:

- To teach various message encryption and decryption technique.
- To provide the fundamentals of network security.

COURSE OUTCOMES:

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

CO1: To study the Symmetric key encryption system, public key encryption system.
CO2: To implement cryptographic algorithms used for security.
CO3: To understand the design concept of cryptography and authentication.
CO4: To understand the design concepts of internet security.
CO5: Should be able to send and receive secure mails.

UNIT I INTRODUCTION **(7)**

Security and Attacks – Services and mechanisms, Cryptography & Cryptanalysis, - Classical encryption techniques.

UNIT II MODERN BLOCK CIPHER **(9)**

Block Cipher Principles– DES, AES, Triple DES, Block Cipher Modes of Operation, Key Management and Distribution.

UNIT III PRINCIPLE OF PUBLIC KEY CRYPTOGRAPHY **(10)**

Principles of Public-Key Cryptosystems- RSA algorithm, DH Key exchange, Hash functions: SHA, MAC, Digital signatures and DSS.

UNIT IV NETWORK SECURITY **(10)**

Firewalls, IP security - Web security, Electronic Mail Security, SSL, TLS.

UNIT V INTRUSION DETECTION SYSTEMS AND **SECURITY TOOLS** **(9)**

IDS- Concepts, Types and Detection Models, Features, Deployment Considerations, Security Information and Event Management (SIEM), Cryptographic security tools: Kerberos, SSH.

TOTAL: 45 PERIODS

TEXT BOOK :

1. William Stallings, "Cryptography and Network Security – Principles and practice", 5th ed., Pearson Education, 2008.

REFERENCES :

1. Mark Rhodes-Ousley, “Information Security The Complete Reference”, 2nd Edition, McGraw-Hill, 2013.
2. B. A. Forouzan, "Cryptography and Network Security", 1st ed.,McGraw Hill.
3. Johannes A Buchmann, “Introduction to Cryptography”, 2nd ed., Spiringer–verlag,
4. Mano W, “Modern Cryptography: Theory & Practice”, Pearson Education, 2004.

Mapping of Course Outcome and Programme Outcome

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
4	x	x		x	x			x		x		x
5		x		x			x			x	x	x

13IT605 **COMPILER DESIGN**

L	T	P	C
3	0	0	3

OBJECTIVES :

- To introduce the major concept areas of language translation and compiler design.
- To enrich the knowledge in various phases of compiler ant its use, code optimization techniques, machine code generation, and use of symbol table.

COURSE OUTCOMES :

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

CO1: To apply the knowledge of lex tool &yacc tool to devleop a scanner & parser.
CO2: To design experiments for Intermediate Code Generation in compiler.
CO3: To design a software system for backend of the compiler.
CO4: To learn how to optimize and effectively generate machine codes
CO5: To analyze the storage allocation strategies in run time environment.

UNIT I INTRODUCTION TO COMPILING (9)

Compilers – Analysis of the source program – Phases of a compiler – Cousins of the Compiler – Grouping of Phases – Compiler construction tools – Lexical Analysis – Role of Lexical Analyzer – Input Buffering – Specification of Tokens.

UNIT II SYNTAX ANALYSIS (9)

Role of the parser –Writing Grammars –Context-Free Grammars – Top Down parsing – Recursive Descent Parsing – Predictive Parsing – Bottom-up parsing – Shift Reduce Parsing – Operator Precedent Parsing – LR Parsers – SLR Parser – Canonical LR Parser – LALR Parser.

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 code generator – The target machine – Runtime Storage management – Basic Blocks and Flow Graphs – Next-use Information – A simple Code generator – DAG representation of Basic Blocks – Peephole Optimization.

UNIT V CODE OPTIMIZATION AND RUN TIME ENVIRONMENTS (9)

Introduction– Principal Sources of Optimization – Optimization of basic Blocks – Introduction to Global Data Flow Analysis – Runtime Environments – Source Language issues – Storage Organization – Storage Allocation strategies – Access to non-local names – Parameter Passing.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Alfred V. Aho, Ravi Sethi& Jeffrey. D. Ullman, “Compilers Principles, Techniques &Tools”,Pearson Education, third edition, 2007.
2. D.M.Dhamdhere, "System Programming and Operating Systems", 2nd Edition., Tata Mcgraw Hill,1995

REFERENCES :

1. Allen I.Holub “compiler Design in C”,Prentice Hall of India,2003.
2. J.P.Bennet, ”Introduction to Compiler Techniques”, Second Edition, Tata McGraw-Hill,2003.

Mapping of Course Outcome and Programme Outcome

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
3		x	x		x		x			x		x
4			x		x	x			x	x	x	x
5	x			x	x		x				x	x

13IT611 **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 module or software package.

COURSE OUTCOMES :

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

CO1: Analyze and solve specific problems alone or in teams during software development.
CO2: Understand and manage a project from beginning to end using UML building blocks.
CO3: Simulate test cases for a software project using different testing and tracking tools
CO4: Use design and programming principles and develop project.
CO5: Deployment of project modules.

The mini-project involves the following stages:

Stage 1: Preparing a project - brief proposal including

- Problem Identification
- A statement of system / process specifications proposed to be developed (Use case Diagram / Data flow diagram)
- List of possible solutions including alternatives and constraints.
- Cost benefit analysis.
- Time Line of activities.

Stage 2: A report highlighting the design finalization based on functional requirements & standards

Stage 3: A presentation including the following:

- Implementation Phase (Hardware / Software / both)
- Testing & Validation of the developed system.

Stage 4: Consolidated report preparation

TOTAL: 30 PERIODS

Mapping of Course Outcome and Programme Outcome

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	
4	x	x		x	x	x	x			x	x	x
5	x	x	x	x	x		x			x	x	x

13IT612 **C# and .NET LABORATORY**

L	T	P	C
0	0	3	2

OBJECTIVES :

To understand the fundamental concepts of the C# language and the .NET framework.

COURSE OUTCOMES:

A student who successfully completes the course will have the ability to

CO1: Develop the window based and web based application.
CO2: Design the components fit into the .NET platform.
CO3: Analyze the structure of a C# application.
CO4: Debug, compiles, and run a simple application.
CO5: Develop programs using C# on .NET.

LIST OF EXPERIMENTS:

1. To write a C# program using Branching and Looping statements.
2. To write a C# program using Arrays and Strings methods.
3. To write a C# program using Structures and enumerations
4. To write a C# program using inheritance concepts.
5. To write a C# program using Polymorphism.
6. To write a C# program using interfaces.
7. To write a C# program by using operator overloading.
8. To write a C# program using delegates, events, errors and exceptions.
9. To write a C# program using Errors and Exceptions.
10. To build a calculator widget in windows application using C#.
11. To write a C# program using multi module Assembly.
12. To write a application using Windows Forms.

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			
2	x								x			
3	x									x		
4	x			x		x			x			
5	x					x			x			

13IT613 COMPUTER GRAPHICS AND MULTIMEDIA LABORATORY

L	T	P	C
0	0	3	2

OBJECTIVES:

- To understand the need of developing 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, student 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. Working with Photo Editing Tools.
11. Working with Video Editing Tools.
12. Working with Animation Tools

Software required:

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

TOTAL: 45 PERIODS

Mapping of Course Outcome and Programme Outcome

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	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

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.Tech 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 IT field.

CO2: Abilty to solve the problems.

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 Outcome and Programme Outcome

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	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:

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 (10)

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 (10)

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

UNIT III APTITUDE (10)

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

TOTAL: 30 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.

Mapping of Course Outcome and Programme Outcome

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	
3	x	x	x	x			x	x	x		x	x

ELECTIVES I (PE)

13ITX01 ADVANCED DATABASE MANAGEMENT SYSTEM

L	T	P	C
3	0	0	3

OBJECTIVES:

- To understand the advanced DBMS concepts using SQL Server.
- To learn about sub queries, triggers and procedures.
- To know about Transaction, Locking and recovery in SQL Server.

COURSE OUTCOMES:

On completion of this course the student will be

CO1 : Able to apply knowledge on creation of database and perform various operations on tables.
CO2 : Able to create stored procedures and cursors.
CO3 : Able to develop applications connected to SQL Server.
CO4 : Construct simple and Moderately advanced database queries using SQL.
CO5 : Apply logical database design principles includes locking mechanisam.

UNIT I SQL SERVER OVERVIEW (9)

SQL Server Architecture - Working with SQL Server - Creating Database - Modifying & Deleting Database - Creating, Modifying and Deleting Tables. Data Integrity - Types of data Integrity - using Constraints and Rules – Planning and Creating Indexes, Index Architecture.

UNIT II QUERY, VIEW, JOINING (9)

Introduction to Queries, Nested Queries, Using exist, not exist, like , not like, in, between and other functions – Summarizing Data, using Aggregate Function, Group By Fundamentals, Listing Top Values, using Compute And Compute by Keyword –Defining View and Advantage of View.

UNIT III TRIGGERS, PROCEDURE & CURSOR (9)

Defining Triggers, Examples of Triggers – Implementing User Defined Procedures. Creating and Executing Procedures - Stored Procedure – Declaring – opening, fetching and closing a cursor.

UNIT IV TRANSACTION & LOCKING MECHANISAM (9)

ACID – Properties Isolation Levels – Types of New Isolation level in SQL Server 2005 - Fundamentals of Locks – Row, Page & Table level Locks – Advantage and Disadvantage of Lock in OLTP Systems.

UNIT V HIGH AVAILABILITY OF SERVER (9)

Disaster Recover – Failover Clustering – Log Shipping – Database Mirroring – What is Replication – Types of Replication.

` **TOTAL : 45PERIODS**

TEXT BOOKS:

1. Abraham Silberschatz, Hentry F.Korth and S.Sudharssan, "Database System Concepts", Tata McGraw Hill, Fourth Edition, 2002.
2. R. Elmasri, S.B. Navathe, "Fundamentals of Database Systems", Pearson Education/Addison Wesley, Fifth Edition, 2007.

REFERENCES:

1. C.J.Date, A.Kannan and S.Swamynathan,"An Introduction to Database Systems", Pearson Education, Eighth Edition, 2006.
2. Robert Vieira, "Professional SQL Server 2005 Programming", Wiley Publication.

Mapping of Course Outcome and Programme Outcome

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
4	x		x								x	x
5	x		x								x	x

13ITX02 DISTRIBUTED AND OBJECT ORIENTED DATABASE

L	T	P	C
3	0	0	3

OBJECTIVE:

- Design and development of distributed and Object oriented database systems.

COURSE OUTCOME:

On completion of this course the student will be

CO1: Able to this course introduces fundamental concepts and implementation of object oriented and distributed database systems.

CO2: Able to with focus on data distribution, query processing, transaction processing, concurrency control and recovery.

CO3: Able to store and retrieve data.

CO4: Design object relational DBMS in distributed environment.

CO5: Access the data by Connection API.

UNIT I DISTRIBUTED DATA BASE (9)

Introduction to Distributed Database: Distributed Data Processing, Concepts of Distributed Database. Distributed vs. Centralized Database System; advantage and application. Transparency, performance and reliability, Problem areas of Distributed Database. Integrity Constraints in Distributed databases. Distributed Database Architectures : DBMS standardization, Architectural models for Distributed DBMS – autonomy, distribution and heterogeneity, Distributed Database architecture – Client/Server , Peer – to – peer distributed systems, MDBMS Architecture, Distributed Catalog management.

UNIT II DISTRIBUTED DATABASE DESIGN & QUERY PROCESSING (9)

Distributed Database Design: Design strategies and issues. Data Replication. Data Fragmentation – Horizontal, Vertical and Mixed. Resource allocation. Semantic Data Control in Distributed DBMS **Distributed Query Processing:** Query Decomposition and Data localization for distributed data, join ordering, semi-join strategy, Distributed Query Optimization methods. Distributed Transaction Management: The concept and role of the transaction. Properties of transactions-Atomicity, Consistency, Isolation and Durability. Architectural aspects of Distributed Transaction, Transaction Serialization.

UNIT III DISTRIBUTED CONCURRENCY CONTROL & RELIABILITY (9)

Distributed Concurrency Control: Lock-based and Timestamp-based Concurrency Control methods. Optimistic method for Concurrency Control. Deadlock management – prevention, avoidance detection, and resolution. Non-serializable schedule and nested distributed transaction. Reliability of Distributed DBMS and Recovery: Concept and measures of reliability, Failure analysis, types of failures. Distributed Reliability Protocols. Recovery techniques. Two Phase Commit, Presumed abort, Presumed commit. Three phase commit, Partitions, Scalability of Replication

UNIT IV OO DATABASE CONCEPT & OODBMS ARCHITECTURE APPROACH (9)

Object Oriented Database Concept: Data types and Object, Evolution of Object Oriented Concepts, Characteristics of Object Oriented Data Model. Object Hierarchies – Generalization, Specialization, Aggregation. Object Schema. Enter-object Relationships, Similarities and difference between Object Oriented Database model and Other Data models. **OODBMS Architecture Approach:** The Extended Relational Model Approach. Semantic Database Approach, Object Oriented Programming Language Extension Approach, DBMS Generator Approach, the Object Definition Language and the Object Query Language.

UNIT V CONNECTIVITY & APPLICATIONS (9)

The Object Oriented DBMS Architecture, Performance Issue in Object Oriented DBMS, Application Selection for Object Oriented DBMS, the Database Design for an Object Relational DBMS. The Structured Types and ADTs, Object identity, Extending the ER Model, Storage and Access Methods, Query Processing, Query Optimization, Data Access API (ODBC, DB Library, DAO, ADO, JDBC, OLEDB), Distributed Computing Concept in Com, COBRA.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Principles of Distributed Database Systems; Ozsu, M. Tamer and Patrick Valduriez, Pearson Education.
2. Object Oriented Database System – Approaches and Architectures; C.S.R. Prabhu, PHI.

REFERENCES:

1. Silberschatz, Abraham, Henry F. Korth and S. Sudarshan: Database System Concepts; McGraw Hill International Edition.
2. Gerald V. Post: Database Management System – McGraw Hill International Edition.
3. Peter Rob, Carlos Coronnel: Database Systems – Design, Implementation and Management; Course Technology.
4. R. Cattel: "Object Data Management", (1993), Addison-Wesley.

Mapping of Course Outcome and Programme Outcome

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		
5	x	x						x		x		x

13ITX03 **OPENSOURCE DATABASE**

L	T	P	C
3	0	0	3

OBJECTIVES:

- To understand the advanced DBMS concepts using PostgreSQL.
- To understand what is a good database design.
- To implement the storing & accessing data from database with Java.

COURSE OUTCOMES:

A student who successfully completes the course will have the ability to

CO1: Able to Frame a well-structured & normalized database.
CO2: Able to Administrate the database.
CO3: Able to Recover a database from transaction failure.
CO4: Able to Lock data between transactions.
CO5: Able to design database and programming with Java.

UNIT I INTRODUCTION TO POSTGRESQL (9)

Programming with Data- Constant Data, Flat Files for Data Storage, Repeating Groups and Other Problems; DBMS - Database Models, Query Languages, Responsibilities; PostgreSQL- History, Architecture, Data Access; Relational Database Principles.

UNIT II ACCESSING DATA (9)

Getting Started with PostgreSQL – Installing in Various Platforms -Creating the Sample Database- Accessing Your Data - Data Interfacing- Adding, Updating, Deleting Data - Advanced Data Selection - Aggregate Functions, Subquery, Joins.

UNIT III DATA MANAGEMENT & SECURITY (9)

Data Definition-Data Types; Data Manipulation -Table Management -Views -Foreign Key Constraints; Transactions- ACID Rules, Single User & Multiple User transactions; Locking.

UNIT IV POSTGRESQL PROCEDURES & ADMINISTRATION (9)

Operators, Built-in Functions, Procedural Languages - Stored Procedures - SQL Functions- Triggers; PostgreSql Administration: System Configuration - PostgreSQL Internal Configuration - Database Backup and Recovery.

UNIT V DATABASE DESIGN & PROGRAMMING POSTGRESQL WITH JAVA (9)

Database Design : Good database design - Stages in Database Design- Converting to a Physical Model - Normal Forms - Common Patterns; Accessing PostgreSQL from Java : Using a PostgreSQL JDBC Driver-Making Database Connections- Working with JDBC Result Sets-Creating JDBC Statements

TOTAL: 45 PERIODS

TEXTBOOK:

1. Neil Matthew and Richard Stones "Beginning Databases with PostgreSQL", Apress, second edition, 2005.

REFERENCES :

1. Bruce Momjian "PostgreSQL Introduction and Concepts" Addison–Wesley, first edition, 2001
2. Korry Douglas; Susan Douglas "PostgreSQL, 2nd Edition" Sams, second edition, 2005
3. Postgresql Manuals – http://www.postgresql.org/docs/
4. Database System Concepts - http://codex.cs.yale.edu/avi/db-book/db6/slide-dir/
5. Regina Obe and Leo Hsu, "PostgreSQL: Up and Running",O'Reilly, first edition, 2012

Mapping of Course Outcome and Programme Outcome

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
3				x	x					x		x
4	x				x		x			x		x
5				x	x						x	x

13ITX04 RELATIONAL DATABASE MANAGEMENT SYSTEM USING DB2

L	T	P	C
3	0	0	3

OBJECTIVES:

To understand the advanced concepts of DBMS

- To understand the demand of Big Data in IT
- To implement DB2 in client-server architecture in secured manner

COURSE OUTCOMES:

The students will be able to

CO1: Understand, analyze and evaluate a mainframe system using DB2 concepts.
CO2: Administer DB2 in a mainframe computer.
CO3: Ensure the security of databases.
CO4: Install various types of DB2 Tools
CO5: Manage the storage model of DB2.

UNIT I INTRODUCTION TO DB2 (9)

A Brief History of DB2 – The Role of DB2 in the Information on Demand World – DB2 Clients – DB2 at a Glance : SQL Statements, XQuery Statements, and DB2 Commands – The DB2 Environment – Database Partitioning Feature - Database Federation – Case Study : The DB2 Environment, DB2 with DPF Environment.

UNIT II INSTALLING DB2 TOOLS (9)

DB2 Installation: Installing DB2 Using the DB2 Setup Wizard - Root and Non-Root Installation on Linux and UNIX - Required User IDs and Groups - Advanced DB2 Installation Methods - Installing DB2 in a DPF Environment - Migrating DB2 - DB2 Tools: The Command-Line Tools - Web-Based Tools - General Administration Tools - Information Tools - Monitoring Tools - Setup Tools – Case study.

UNIT III CLIENT AND SERVER CONNECTIVITY (9)

Client and Server Connectivity: The DB2 Database Directories - Supported Connectivity Scenarios - Configuring Database Connections Using the Configuration Assistant - Diagnosing DB2 Connectivity Problems - The DB2 Environment – The DB2 Instance - The Database Administration Server - Configuring a Database - Instance and Database Design Considerations - Case study.

UNIT IV DB2 STORAGE MODEL (9)

Databases: Logical and Physical Storage of Your Data - Database Partition Groups - Table Spaces - Buffer Pools - DB2 Database Objects: Data Types – Tables – Indexes - Multidimensional Clustering Tables and Block Indexes – Views – Packages – Triggers - Stored Procedures - User-Defined Functions – Sequences - Case study.

UNIT V IMPLEMENTING SECURITY (9)

DB2 Security Model: Authentication - Data Encryption - Administrative Authorities - Database Object Privileges - Label-Based Access Control - Authority and Privilege Metadata - Windows Domain Considerations - Trusted Contexts Security Enhancement - DB2 Locking and Concurrency: Concurrency and Locking Scenarios - DB2 Isolation Levels - DB2 Locking - Diagnosing Lock Problems - Techniques to Avoid Locking – Case Study.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. DB2 Essentials – IBM - Roland Barcia, Bill Hines, Tom Alcott, and Keys Botzum – Third Edition (2014).
2. Understanding DB2 Learning Visually with Examples - Raul F. Chong, Xiaomei Wang, Michael Dang, Dwaine R. Snow- IBM Press - Second Edition (2008).

REFERENCES :

1. Beginning DB2: From Novice to Professional Apress; 2008 edition (21 August 2008) , by Grant Allen (Author).
2. DB2 Database Concepts-Prentice-hall Of India Pvt Ltd (2005) by I. B. M. (Author).
3. DB2: The Complete Reference Tata McGraw Hill Education (2002) by Paul Zikopoulos (Author), IBM (Author), Roman Melnyk (Author).

Mapping of Course Outcome and Programme Outcome

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
4		x	x		x			x		x	x	x
5	x		x	x		x				x		x

13ITX05 **COMPOSING MOBILE APPS**

L	T	P	C
3	0	0	3

OBJECTIVES:

This course aims to teach mobile app development using Android as the development platform.

COURSE OUTCOMES:

At the end of this elective, student shall be able to

CO1: Appreciate the Mobility landscape.
CO2: Familiarize with Mobile apps development aspects.
CO3: Understand object-oriented concepts, design user interfaces for mobile devices, develop mobile applications, and create and consume web services.
CO4: Design and develop mobile apps, using Android as development platform, with key focus on user experience design, native data handling and background tasks and notifications.
CO5: Appreciation of nuances such as native hardware play, location awareness, graphics, an Multimedia.

UNIT I GETTING STARTED WITH MOBILITY (7)

Mobility landscape, Mobile platforms, Mobile appsdevelopment, Overview of Android platform, setting up the mobile app development environment along with an emulator, a case study on Mobile app development.

UNIT II BUILDING BLOCKS OF MOBILE APPS (15)

App user interface designing – mobile UI resources (Layout, UI elements, Draw-able, Menu), Activity- states and life cycle, interaction amongst activities.

App functionality beyond user interface - Threads,Async task,Services – states and lifecycle, Notifications, Broadcastreceivers,Telephony and SMS APIs

Native data handling – on-device file I/O, shared preferences, mobile databases such as SQLite, and enterprise data access (via Internet/Intranet)

UNIT III SPRUCING UP MOBILE APPS (9)

Graphics and animation – custom views, canvas, animation APIs, multimedia – audio/video playback and record, location awareness, and native hardware access (sensors such as accelerometer and gyroscope)

UNIT IV TESTING MOBILE APPS (8)

Debugging mobile apps, White box testing, Black box testing, and test automation of mobile apps, JUnit for Android, Robotium, MonkeyTalk.

UNIT V TAKING APPS TO MARKET (6)

Versioning, signing and packaging mobile apps, distributing apps on mobile market place.

TOTAL: 45 PERIODS

TEXT BOOK :

1. Anubhav Pradhan, Anil V Deshpande, “Mobile Apps Development”, First Edition, 2013.

REFERENCES :

1. Barry Burd, “Android Application Development All in one for Dummies”, First Edition, 2013.
2. “Teach Yourself Android Application Development In 24 Hours”, SAMS Publication.

Mapping of Course Outcome and Programme Outcome

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		x	x	x	x	x
3		x	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

13ITX06 **BUILDING ENTERPRISE APPLICATIONS**

L	T	P	C
3	0	0	3

OBJECTIVES:

The aim of this paper includes designing and developing high quality enterprise applications and other task related to it.

COURSE OUTCOMES:

At the end of this course, student shall be able to

CO1: Familiarize with concept of Enterprise Analysis and Business Modeling.
CO2: Understand requirements validation, planning and estimation.
CO3: Design and document the application architecture.
CO4: Understand the importance of application framework and designing other application components.
CO5: Construct different solution layers and perform Code review, Code analysis, build process.

UNIT I **(8)**

Introduction to enterprise applications and their types, software engineering methodologies, life cycle of raising an enterprise application, introduction to skills required to build an enterprise application, key determinants of successful enterprise applications, and measuring the success of enterprise applications

UNIT II **(9)**

Inception of enterprise applications, enterprise analysis, business modeling, requirements elicitation, use case modeling, prototyping, non functional requirements, requirements validation, planning and estimation

UNIT III **(9)**

Concept of architecture, views and viewpoints, enterprise architecture, logical architecture, technical architecture-design, different technical layers, best practices, data architecture and design – relational, XML, and other structured data representations, Infrastructure architecture and design elements - Networking, Internetworking, and Communication Protocols, IT Hardware and Software, Middleware, Policies for Infrastructure Management, Deployment Strategy, Documentation of application architecture and design

UNIT IV **(9)**

Construction readiness of enterprise applications - defining a construction plan, defining a package structure, setting up a configuration management plan, setting up a development environment, introduction to the concept of Software Construction Maps, construction of technical solutions layers, methodologies of code review, static code analysis, build and testing, dynamic code analysis – code profiling and code coverage

UNIT V **(9)**

Types and methods of testing an enterprise application, testing levels and approaches, testing environments, integration testing, performance testing, penetration testing, usability testing, globalization testing and interface testing, user acceptance testing, rolling out an enterprise application.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Anubhav Pradhan, Satheesha B. Nanjappa, Senthil K. Nallasamy, Veerakumar Esakimuthu "Raising Enterprise Applications", John Wiley Publication.
2. Brett McLaughlin, "Building Java Enterprise Applications", O'Reilly Media Publication.

REFERENCES:

1. "Software Requirements: Styles & Techniques", Addison-Wesley Professional.
2. "Software Systems Requirements Engineering: In Practice", McGraw-Hill Osborne Media.
3. "Managing Software Requirements: A Use Case Approach", Second Edition, Pearson Publication.
4. "Software Architecture: A Case Based Approach", Pearson Publication.

Mapping of Course Outcome and Programme Outcome

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		
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

13ITX07 BUSINESS INTELLIGENCE (BI) – DATA WAREHOUSING AND ANALYTICS

L	T	P	C
3	0	0	3

OBJECTIVES:

- The proposed elective course exposes engineering/management students to Business Intelligence domain. The Core Modules of this elective includes introduction to BI terminologies and framework, basics of data integration (Extraction Transformation Loading), introduction to multi-dimensional data modeling, basics of enterprise reporting and application of the concepts using open source/Microsoft tools.

COURSE OUTCOMES:

At the end of this elective, student will be able to

CO1: Differentiate between Transaction Processing and Analytical applications and describe the need for Business Intelligence& Demonstrate understanding of technology and processes associated with Business Intelligence Framework.

CO2: Demonstrate understanding of Data Warehouse implementation methodology and project lifecycle.

CO3: Given a business scenario, identify the metrics, indicators and make recommendations to achieve the business goal.

CO4: Design an enterprise dashboard that depicts the key performance indicators which helps in decision making.

CO5: Demonstrate application of concepts using open source/MS Office.

UNIT I INTRODUCTION TO BUSINESS INTELLIGENCE (9)

Introduction to digital data and its types – structured, semi-structured and unstructured, Introduction to OLTP and OLAP (MOLAP, ROLAP, HOLAP), BI Definitions & Concepts,BI Framework, Data Warehousing concepts and its role in BI, BI Infrastructure Components – BI Process, BI Technology, BI Roles & Responsibilities, Business Applications of BI, BI best practices.

UNITII BASICS OF DATA INTEGRATION (EXTRACTION TRANSFORMATION (9)

Concepts of data integration, needs and advantages of using data integration, introduction to common data integration approaches, Meta data – types and sources, Introduction to data quality, data profiling concepts and applications, introduction to ETL using Pentaho data Integration (formerly Kettle).

UNIT III INTRODUCTION TO MULTI-DIMENSIONAL DATA MODELING (9)

Introduction to data and dimension modeling, multidimensional data model, ER Modeling vs. multi dimensional modeling, concepts of dimensions, facts, cubes, attribute, hierarchies, star and snowflake schema, introduction to business metrics and KPIs, creating cubes using Microsoft Excel.

UNIT IV BASICS OF ENTERPRISE REPORTING (9)

A typical enterprise, Malcolm Baldrige - quality performance framework, balanced scorecard, enterprise dashboard, balanced scorecard vs. enterprise dashboard, enterprise reporting using MS Access / MS Excel, best practices in the design of enterprise dashboards.

UNIT V PRACTICAL EXPOSURE **(9)**

Project 1: Data in disparate data sources such as Excel, text file, databases etc. will be provided to the students. They will be expected to extract, cleanse, integrate and load it into the data-warehouse.

Project 2: Design reports according to given business scenarios. The data for the report s is to be pulled from the data-warehouse built in the earlier project.

Integrated Project: Extract data from various data sources, perform transformations, load into target database/spreadsheet, create a cube and pull reports on the data.

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TOTAL: 45 PERIODS

TEXT BOOKS :

1. "Fundamentals of Business Analytics" by R.N.Prasad and Seema Acharya

REFERENCES :

1. Business Intelligence by David Loshin.
2. Business intelligence for the enterprise by Mike Biere.
3. Business intelligence roadmap by Larissa Terpeluk Moss, ShakuAtre.
4. An introduction to Building the Data Warehouse – IBM.
5. Business Intelligence For Dummies – Swain Scheps.
6. Successful Business Intelligence: Secrets to making Killer BI Applications by CindiHowson.
7. Information dashboard design by Stephen Few.

Mapping of Course Outcome and Programme Outcome

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	x
4	x	x			x					x		x
5	x				x	x				x	x	x

SEMESTER VII

13IT701 **SOFTWARE TESTING**

L	T	P	C
3	0	0	3

OBJECTIVES:

- To study the fundamentals of software testing.
- To provide a complete, comprehensive coverage of various software testing methods.
- To develop test cases using manual testing and to enable the learner to become a Software Tester.

COURSE OUTCOMES:

A student who successfully completes the course will have the ability to

CO1: Understand the Software Testing Concepts.
CO2: Learn the working of manual testing.
CO3: Design the test cases and to getting familiarity over testing tools.
CO4: Use the techniques, skills and modern software testing tools necessary for testing.
CO5: Use the testing tools to check the behaviour of the real time application.

UNIT I INTRODUCTION TO QUALITY AND SOFTWARE QUALITY (9)

Introduction- Software Development Life Cycle (SDLC)-Historical Perspective of Quality-Definition of Quality-Total Quality Management-Continuous Improvement Cycle-Constraints of Software Quality Assessment-Customer is a King-Software Quality Management-Why software has defects?-Important Aspects of Quality Management-Types of Products-Quality Management System Structure-Pillars of Quality Management System

UNIT II FUNDAMENTALS OF SOFTWARE TESTING (9)

Definition of Testing-Approaches to Testing-Popular Definitions of Testing-Testing during Development Life Cycle-Requirements Traceability Matrix-Essentials of Software Testing-Workbench-Important Features of Testing Process-Test Planning-Test Team Approach-Testing Process- Black Box Testing-White Box Testing.

UNIT III MANAGEMENT CONCEPTS AND TESTING TECHNIQUES (9)

Configuration Management-Configurable Items-Base lining-Configuration Management Planning-Types of Software Risks-Handling of Risks in Testing- Unit Testing- Integration Testing – System Testing – User Acceptance Testing -SRS – Use case Design-Test Case Design-Bug Report Preparation

(9)

UNIT IV FUNCTIONALITY TOOL

Introduction to Silk Test-Silk Test Architecture-Automated Testing Process-Quick start with Silk Test-Configuring the settings-Exposure to Silk Test IDE-Plug and Play test case.

UNIT V TEST MANAGEMENT TOOL (9)

Introduction-Testing Process-Specifying Testing Requirements-Planning Tests-Calling Tests with Parameters-Creating and Viewing Requirements Coverage-Generating Automated Test Scripts-Running Tests-Defining Test Sets

TOTAL: 45 PERIODS

TEXT BOOKS :

1. M.G.Limaye , Software Testing, Tata McGraw-Hill, 2014.
2. R.S. Pressman, "Software Engineering, a practitioner "approach," 7th edition, McGraw Hill 2010.

REFERENCES :

1. Dr. K.V.K.K Prasad , Software Testing Tools, Dreamtech 2004.
2. URL: www.onestoptesting.com/SilkTest
3. URL: www.onestoptesting.com/testdirector

Mapping of Course Outcome and Programme Outcome

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			x	x		
4	x			x		x			x			
5	x					x			x			

13IT702 **MOBILE COMMUNICATION**

L	T	P	C
3	0	0	3

OBJECTIVES :

- To understand the concepts used in Cellular System.
- To understand the concepts of different Wireless networks.
- To study the functions of Mobile Network Layer and Transport Layer.
- To make Graduates to get idea about the different Wireless protocols and Mobility Support.

COURSE OUTCOMES:

A student who successfully completes the course will have the ability to

CO1: Identify the components required to build Cellular Wireless Network.
CO2: Choose the required wireless network for given application.
CO3: Identify solution for routing issues, at Network layer.
CO4: Learned about Mobile TCP functionalities.
CO5: Trace the flow of information in all kind of mobile network applications.

UNIT I CELLULAR WIRELESS NETWORKS **(9)**

Principles of Cellular Networks- Concept of Cell-Frequency reuse -Operation of Cellular Systems- Handoff, 2G - GSM architecture – GPRS architecture reference model–Advantages and Design Considerations of CDMA, 3G- Design Considerations of WCDMA-TMT 2000, Overview of 4G

UNIT II WIRELESS NETWORKS **(9)**

Wireless LAN – IEEE 802.11 System Architecture - Infrastructure based and ad-hoc network -Standards & Services- Protocol architecture, Bluetooth- WPAN- Architecture - Protocol stack-LLCAP- IEEE 802.15 and subgroups, WiMAX and IEEE 802.16 Broadband Wireless Access Standards–System and Protocol Architecture –Services.

UNIT III MOBILE NETWORK LAYER **(9)**

Mobile IP-Goals, assumptions and requirements- Entities and terminology- Agent discovery- Registration- Tunneling and encapsulation, DHCP - Client initialization via DHCP, Mobile ad-hoc networks- MANETs and mobile IP, Routing- overview of DSDV & DSR, ad-hoc routing protocols.

UNIT IV MOBILE TRANSPORT LAYER **(9)**

Overview of Traditional TCP- Congestion control- Slow start- Fast retransmit/fast recovery, Classical TCP improvements - Indirect TCP- Snooping TCP - Mobile TCP- Selective retransmission-Transaction oriented TCP, TCP over 2.5/3G wireless networks.

UNIT V MOBILITY SUPPORT **(9)**

System architecture-Client Proxy as Browser- Network Proxy as Browser Support - Client and Network Proxy with Special Transmission Protocol, Wireless Application Protocol- Forum- Architecture- WDP- WTLS- WTP- WTP classes- WSP-WAE Wireless Telephony Application-User Agent - Logical Architecture, WAP 2.0- Architecture -Protocol Stacks

TOTAL: 45 PERIODS

TEXT BOOKS :

1. Jochen Schiller, “Mobile Communications”, Second Edition, Pearson Education, 2014.
2. William Stallings, “Wireless Communications and Networks”, Pearson Education, 2007.

REFERENCES :

1. Rappaport, “Wireless Communications: Principles and Practice”, Pearson Education India, 2009.
2. Andreas F. Molisch,“Wireless Communications”, 2nd Edition, Willy Publication, 2010
3. B.S.Manoj, C.Siva Ram Murthy, “Adhoc Wireless Networks”, Pearson Education, 2014

Mapping of Course Outcome and Programme Outcome

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		x
4	x	x		x	x			x		x		x
5	x	x			x	x	x	x		x		x

13IT703 **CLOUD COMPUTING**

L	T	P	C
3	0	0	3

OBJECTIVES :

- To know the role of cloud computing.
- To learn the basics of cloud management and concept of virtualization
- To work on cloud environment.
- To learn on future of cloud.

COURSE OUTCOMES:

A student who successfully completes the course will have the ability to

CO1: Understand the basic terminology used in cloud computing.
CO2: Use different virtualization technology in cloud management.
CO3: Design programs involving cloud infrastructure & security.
CO4: Explain the extension of cloud in smart devices.
CO5: Understand the cloud applications

UNIT 1 INTRODUCTION TO CLOUD COMPUTING (9)

Introduction – Characteristics of Cloud Computing – Overview of Cloud Application – Cloud Computing Architecture – Logical Architecture, Types of Clouds, Role of Standard. Cloud computing services – Scalability and Fault Tolerance.

UNIT 2 CLOUD MANAGEMENT AND VIRTUALIZATION TECHNIQUES (9)

Creating a virtualized architecture – Data Center, Data center Network Architecture. Concepts of Map Reduce- Fundamental concepts of compute Storage- Network Virtualization- Desktop and application Virtualization- Block and File level Storage Virtualization- Infrastructures Requirements- Benefits of Virtualization.

UNIT 3 CLOUD SECURITY (9)

Fundamentals- Cloud security services- Design principles- policy implementation- security challenges- Security Architecture- public key infrastructure, Encryption key management, Digital certificates and Key managements. Market based management of clouds.

UNIT 4 HADOOP AND MAP REDUCE (9)

Introduction- Data sources – Data Storage and Analysis – Comparison with other system- Case Study: The Apache HADOOP Project – Cluster Setting. Map Reduce – Weather Dataset – analysing the Data with UNIX Tools – Analysing the Data with HADOOP – HADOOP Streaming- HADOOP Pipes.

UNIT 5 THE FUTURE OF THE CLOUD (9)

How the cloud will change operating systems- location – Intelligent Fabrics, paints - Future of Cloud TV- Future of Cloud based Smart Devices- Cloud and Mobile – Home based Cloud Computing- Business impact and Economics in Cloud.

TOTAL: 45 PERIODS

TEXT BOOK:

1. Kris Jamsa , Jones and Bartlett, “Cloud Computing SAAS , PaaS, IaaS, Virualization, Business Models, Security & more”, Student Edition , 2014 .

REFERENCES:

1. Kailash Jayaswal, Jagannath Kallakurchi, Donald J.Houde, Dr.Deven Shah , “Cloud Computing, Kogent Learning Solutions” , Indispensable Comprehensive Reference, 2014.
2. Pankaj Sharma, Cloud Computing, S.K. Kataria & Sons Publisher of Engineering and Computer Books,2013.

Mapping of Course Outcome and Programme Outcome

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	
3	x	x	x				x		x			
4	x	x	x				x					
5				x		x	x					

13IT711 **SOFTWARE TESTING LABORATORY**

L	T	P	C
0	0	3	2

OBJECTIVES :

- To get the knowledge on the fundamentals of software testing tools.
- To get practical knowledge and comprehensive coverage of various software testing methods.
- To develop test cases and to enable the learner to become a Software Tester.

COURSE OUTCOMES:

A student who successfully completes the course will have the ability to

CO1: Demonstrate knowledge of Software Testing concepts in the projects.
CO2: Learn the various software testing tools.
CO3: Design the test cases for the software project
CO4: Use the techniques, skills and modern software testing tools necessary for testing.
CO5: Use the testing tools to check the behavior of the real time application

LIST OF EXPERIMENTS:

1. Develop a SRS for any one application.
2. Draw the design for any one application.(Data Flow Diagram)
3. Test Plan Preparation of window based and web based application.
4. Create a use case design of any application
5. Test case design of any application
6. Bug Report design of any application
7. Testing with Test Director Tool.
8. Testing with Silk Test.
9. Regression Testing and Scripting with Silk Test.
10. Scripting using Junit Tool.

TOTAL: 60 PERIODS

Mapping of Course Outcome and Programme Outcome

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
4	x			x		x			x			x
5	x					x			x			x

13IT712

CLOUD COMPUTING LABORATORY

L	T	P	C
0	0	3	2

OBJECTIVES:

- To provide the basic practical exposure to all the engineering and technological streams in the field of Cloud computing.

COURSE OUTCOMES:

On completion of this course the students will be able to

CO1: Acquire the fundamental knowledge in Cloud environment.
CO2: Gain the basic knowledge about Hadoop cluster.
CO3: Analyse the properties Azure.
CO4: Understand about working in cloud.
CO5: Identify the basic parameters of data storage.

LIST OF EXPERIMENTS:

1. Working of Google Drive to make spread sheet and notes
2. Installation and Configuration of Justcloud.
3. Working in Cloud9 to demonstrate different language
4. Working in Codenvy to demonstrate Provisioning and Scaling of a website
5. Installation and Configuration of Hadoop/Eucalyptus
6. Working and installation of Google App Engine
7. Working and installation of Microsoft Azure
8. Working with Mangrasoft Aneka Software

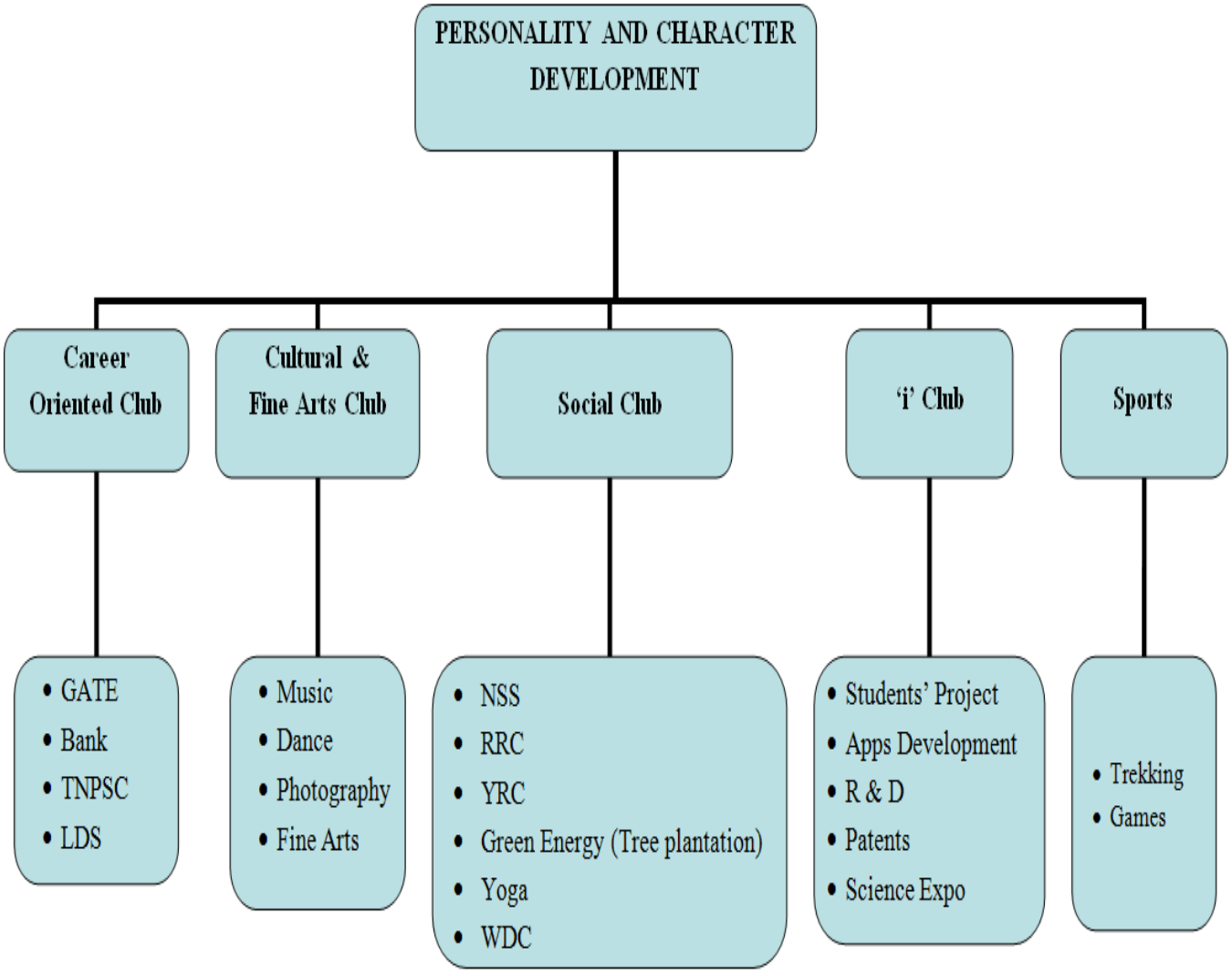
TOTAL = 60 HOURS

Mapping of Course Outcome and Programme Outcome

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	
3	x	x	x				x		x			
4	x	x	x				x					
5	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**
• To provide support for identifying specific career field of interests and career path • To provide support for preparing for competitive exams	• 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	• 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, discipline and being helpful towards the community.	• 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	• 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. **Trekking:** • 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				
• Find a better career of their interest. • Make use of their knowledge during competitive exams and interviews.	• Take part in various events • Develop team spirit, leadership and managerial qualities	• Develop socially responsive qualities by applying acquired knowledge • Build character, social consciousness, commitment and discipline	• 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	• 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)

SEMESTER VIII

13IT831 **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:

Upon Completion of the course the students will be able to

CO1: Formulate a problem definition in the field of Information Technology 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 Outcome and Programme Outcome

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
4			x					x			x	x
5			x			x	x	x			x	x

13ITX08 **PROGRAMMING WITH ASP.NET**

L	T	P	C
3	0	0	3

OBJECTIVES:

- Understanding Web Designing and Development.
- Understanding Server Control management. .
- Developing Web application using ASP.Net .

COURSE OUTCOMES:

A student who successfully completes the course will have the ability to

CO1: Understand installation process of Visual Studio.
CO2: Install, configure, and run ASP.Net
CO3: Understand the concept of ASP.Net controls
CO4: Understand Files and streams
CO5: Design web UI using Web controls & web services.

UNIT 1 INTRODUCTION TO ASP.NET FRAMEWORK (9)

Overview of .NET Framework – Exploring Visual studio IDE – ASP.NET Technology – Lifecycle – Location for a web application - Page directives – Compilation in ASP.NET

UNIT 2 ASP.NET STANDARD AND NAVIGATION CONTROLS (9)

Standard Controls(I) – Standard Controls (II) – Navigation : TreeView class, TreeView Control, Menu Class, Control, SiteMap Path Class, Control, Validation Controls.

UNIT 3 WORKING WITH FILES AND STREAMS (9)

Namespace – Drives – Directories – Files – Dynamic data applications – Dynamic data – Templates – Dynamic data controls.

UNIT 4 WEB CONTROLS AND ACCESSING DATA IN ASP.NET (9)

Introducing Web parts Controls – HTML Controls – Working with Database Controls – LinQ Queries – ADO.NET Entity Framework.

UNIT 5 ASP.NET WEB SERVICES (9)

Application Globalization – Web Services – WCF Services – Session Tracking – Cookies – Cache – Introduction to MVC Framework.

TOTAL: 45 PERIODS

TEXT BOOK:

1. Black Book, “ASP.NET 4.0”, Kogent Learning Solutions Inc, Dreamtech press,2012.

REFERENCE:

1. Matthew MacDonald, “The Complete Reference, ASP.NET,” Mc GrawHIll, 2014

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		
4	x	x	x	x		x				x		
5	x		x	x		x			x	x	x	

13ITX09 PROGRAMMING WITH JAVA 2 ENTERPRISE EDITION

L	T	P	C
3	0	0	3

OBJECTIVES :

- To understand understanding design patterns
- To understand Concepts needed for distributed and multi-tier applications

COURSE OUTCOMES:

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

CO1: Develop database application.
CO2: Create network based applications.
CO3: Create enterprise business applications
CO4: Implement Server side programming
CO5: Develop dynamic software components.

UNIT 1 JAVA COLLECTIONS AND ADVANCED JDBC (8)

Collections: Collection Interfaces, Concrete Collections, Collections Framework. Databases with JDBC, JDBC driver types, Advanced Data types, Prepared Statements, Transaction Processing**.**

UNIT 2 NETWORKING AND RMI (10)

Networking Internet Addressing, InetAddress, Factory Methods, Instance Methods, TCP/IP Client Sockets, URL, URL Connection, TCP/IP Server Sockets, Datagrams.Remote Method Invocation: Defining the Remote Interface, Implementing the Remote Interface, Compiling and Executing the Server and the Client

UNIT 3 EJB (9)

Enterprise Java Bean: Preparing a Class to be a JavaBean, Creating a JavaBean, JavaBean Properties, EJB types, Session bean, Entity bean, Message Driven bean, and deployingEJB application.

UNIT 4 SERVLETS AND JSP (9)

Servlets: Servlet Overview and Architecture, Interface Servlet and the Servlet Life Cycle, Handling HTTP get Requests, Handling HTTP post Requests, Redirecting Requests to Other Resources, Session Tracking, Cookies, Session Tracking with HttpSession. Java Server Pages (JSP): Introduction, Java Server Pages Overview, A First Java Server Page Example, Implicit Objects, Scripting, Standard Actions, Directives, Custom Tag Libraries.

UNIT 5 CORBA AND STRUTS-2 MVC (9)

Common Object Request Broker Architecture (CORBA): Technical/Architectural Overview, Interface Definition language, Object Request Broker, portable object adapter, CORBA services. Introduction to Java Struts-2 MVC Framework – Architectural overview of the Struts-2 MVC pattern – Struts configuration - Actions – Interceptors – Result Types.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. H. M.Deitel, P. J. Deitel, S. E. Santry, "Advanced Java 2 Platform How to program" – Prentice Hall,2002.
2. "Java EE 7 Tutorial" by Eric Jendrock, Ricardo Cervera-Navarro, Ian Evans, Kim Haase, William Markito, Chinmayee Srivathsa, Addison-Wesley Professional, 5 edition, 2014.

REFERENCES:

1. Antonio Goncalves, "Beginning Java™ EE 6 Platform with GlassFish 3 From Novice to Professional"– Apress publication
2. Hortsmann & Cornell, "CORE JAVA 2 ADVANCED FEATURES, VOL II", Pearson Education, 2002.
3. Patrick Naughton, "COMPLETE REFERENCE: JAVA2", Tata McGraw-Hill, 2003.
4. URL: http://www.tutorialspoint.com/struts_2/index.htm
5. URL: http://java.sun.com

Mapping of Course Outcome and Programme Outcome

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								
4		x		x								
5					x		x				x	

13ITX10 **PROGRAMMING WITH PYTHON**

L	T	P	C
3	0	0	3

OBJECTIVES:

- Ability to analyses and synthesis.
- Ability to solve problem using Python.
- Ability to create software's using python language .

COURSE OUTCOMES:

A student who successfully completes the course will have the ability to

CO1: Execute Python code in a variety of environments.
CO2: Use the correct Python control flow construct.
CO3: Understand the Python functions and variables.
CO4: Trap various errors via the Python Exception Handling model.
CO5: Create their own classes and use existing Python classes.

UNIT I Introduction and Environment **(9)**

History of Python, Python Features, Installing Python, Environment,, Python, Basic Syntax-First python Program-identifiers-keywords-multiline statements-Comment line arguments, Variables-Assigning Values to Variables-Multiple Assignment-Standard Data Types.

UNIT II Language Components & Collections **(9)**

Basics Operators, Decision Making, Loops, Numbers- Number Type Conversion- Random Number Functions- Mathematical Constants, Strings- Accessing Values in Strings- String Special Operators- String Formatting Operator- Triple Quotes- Unicode String- Built-in String Methods, LISTS- Accessing Values in Lists- Updating Lists- Deleting List Elements- Basic List Operations- Built-in List Functions and Methods, Tuples- Accessing Values in Tuples- Updating Tuples- Deleting Tuple Elements- Tuples Operations-Tuple Functions.

UNIT III Functions & Modules **(9)**

Functions- Defining a Function- Calling a Function- Passing by Reference Versus Passing by Value- Function Arguments- Scope of Variables- Global vs. Local variables, Modules- The import Statement- The from...import Statement- The from import Statement- Locating Modules- The Python Path Variable- Namespaces and Scoping- The dir( ) Function- The globals() and locals() Functions- The reload() Function- Packages in Python.

UNIT- IV Exception & Files I/O **(9)**

Files I/O-Reading Keyboard Input- The raw input Function- Opening and Closing Files- The open Function- The close() Method- The write() Method- The read() Method- Renaming and Deleting Files- Directories in Python, Exception- Handling an Exception- The except Clause- The try-finally Clause- Argument of an Exception- Raising an Exception- User-Defined Exceptions

UNIT V Classes and Objects & Regular Expressions

Overview of OOP Terminology - Creating Classes - Creating Instance Objects - Accessing Attributes- Built-In Class Attributes- Destroying Objects (Garbage Collection)- Class Inheritance- Overriding Methods- Overloading Methods- Overloading Operators, Regular Expressions : The match Function- The search Function- Matching Versus Searching- Regular-Expression Patterns- Grouping with Parentheses- Back references.

TOTAL: 45 HOURS

TEXT BOOKS:

1. Martin C. Brown, "PYTHON: The Complete Reference", McGraw Hill, 2001.
2. David M. Beazely , "Python Essential Reference", 4th Edition 2009

REFRENCES:

1. PYTHON Programming Language, Copyright 2014 by Tutorials Point (I) Pvt. Ltd.
2. David M. Beazely , "Python Essential Reference", 4th Edition 2009 .
3. Naomi R. Ceder , The Quick Python Book , Second Edition, 2010.
4. Paul Barry, Head First Python Paperback – Import, 2010.

Mapping of Course Outcome and Programme Outcome

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	
3							x				x	
4	x	x	x				x		x			
5	x	x	x				x					

13ITX11 **PROGRAMMING WITH PHP**

L	T	P	C
3	0	0	3

OBJECTIVES :

- To understand the fundamental concepts in PHP.
- To have a knowledge in using OOP with PHP.
- To learn about queries in MySQL.

COURSE OUTCOMES:

Upon completion of this course the students will able to

CO1: Get the introduction about basics of PHP.
CO2: Understand the Control flows, Strings, Arrays and Functions.
CO3: Understand OOP and advance OOP.
CO4: Familiarize with forms and advanced PHP.
CO5: Understand the MySQL.

UNIT I INTRODUCTION (9)

Features- Basic development concepts- Creating a first PHP script- Comments to PHP code- Working and storing data in variables- Constants- PHP internal data types- Manipulating variables with operators.

UNIT II FLOW CONTROLS, STRINGS, ARRAYS AND FUNCTIONS (9)

Flow controls: If, If else, Switch, For, While, Do While, For each- Working with strings functions- Storing Data in arrays- Processing arrays with loops and iterators- Working with array functions- Creating user defined functions- Working with Dates and Times- MVC framework architecture overview.

UNIT III OBJECT ORIENTED PROGRAMMING (9)

Classes and Objects- Constructors - Inheritance- Overriding- Overloading- Creating static methods- Abstract classes- Interfaces- Final keyword- Magic functions.

UNIT IV PHP FORMS AND ADVANCED PHP (9)

PHP Form handling- Form validations: PHP Form validations, HTML5 Form validations, JavaScript Form validations, JQuery Form validations- Case study: Create a sample user registration form with validations- File handling functions: File Open/Read- File Create/Write- File Upload- PHP Error handling- Working with Cookies- Working with Sessions- PHP Include.

UNIT V MySQL (9)

Database- Essential SQL- Creating MySQL Database- Creating a new table- Putting data into the database- Accessing the database- Updating database- Deleting records- MySQLi overview.

TOTAL: 45 PERIODS

TEXT BOOKS :

1. VikramVaswani, “PHP: A BEGINNERS GUIDE”, TATA McGRAW-HILL Edition, 2009.
2. Steven Holzner, “PHP: The Complete Reference”, TATA McGRAW-HILL Edition. 2009.

REFERENCES :

1. Joel Murach,Ray Harris “Murach’s PHP and MySQL”, 2nd edition.
2. Lynn Beighley,Michael Morrison “Head First PHP and MySQL.
3. URL: www.w3schools.com/php/

Mapping of Course Outcome and Programme Outcome

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					
3				x		x				x		
4		x	x	x		x						
5		x		x			x					

13ITX12 **INFORMATION STORAGE MANAGEMENT**

L	T	P	C
3	0	0	3

OBJECTIVES :

- 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, student 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.

(9)

UNIT V Information storage on Cloud

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 PERIODS

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",TataMcGraw Hill,Osborne, 2003.
3. Marc Farley, "Building Storage Networks",TataMcGraw Hill, Osborne. 2001.
4. MeetaGupta, Storage Area Network Fundamentals, Pearson Education Limited, 2002

Mapping of Course Outcome and Programme Outcome

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		
4	x	x	x	x		x				x		
5	x		x	x		x			x	x	x	

13GEC03 PROFESSIONAL ETHICS AND HUMAN VALUES

L	T	P	C
3	0	0	3

OBJECTIVES:

- To understand the core values that shapes the ethical behavior of an engineer.
- To inculcate a spirit of togetherness, unity and team work in an organization.
- To make him reasonably a 'good' professional conscious of his duties to the society.
- To give an overview of sense of social responsibility and security.

COURSE OUTCOMES:

A student who successfully completes the course will have the ability to:

CO1: Deal with complex situations with the people in the society in making the work environment congenial, encouraging and loving.
CO2: Understand the basic ethical theories discussing the ethics of good and bad patterns of character.
CO3: Understand the basics regarding the leadership.
CO4: Implement the concepts in one's career for achieving excellent job satisfaction.
CO5: Choose appropriate statistical techniques for improving processes.

UNIT 1 HUMAN VALUES (8)

Morals, Values and Ethics – Integrity, Work Ethic and Service Learning –Virtues – Respect for Others – Living Peacefully – Caring, Sharing and Honesty – Courage, Valuing Time and Co-operation – Commitment, Empathy and Self-Confidence – Challenges in the Work Place – Spirituality.

UNIT II ENGINEERING ETHICS (8)

Senses of 'Engineering Ethics' - Variety of moral issues - Types of inquiry - Moral Dilemmas - Moral Autonomy – Moral Development - Consensus and Controversy – Profession – Self-Respect and Senses of Responsibility - Theories about Right action – Self –interest, customs and religion.

UNIT III ENGINEERING AS SOCIAL EXPERIMENTATION (9)

Engineering as experimentation - Engineers as responsible experimenters - Codes of Ethics – Industrial Standards - A balanced outlook on law – Case Study: The challenger.

UNIT IV THE ENGINEER'S RESPONSIBILITY FOR SAFETY (10)

Safety and risk - Assessment of safety and risk - Risk benefit analysis and reducing risk – Case Study: Three mile island and Chernobyl. Collegiality and Loyalty - Respect for Authority - Collective Bargaining - Confidentiality - Conflicts of Interest - Occupational crime - Human rights and Employee rights.

UNIT V GLOBAL ISSUES (10)

Multinational corporations - Environmental ethics - Computer ethics - Engineers as managers - Consulting engineers - Engineers as expert witnesses and advisors - Moral leadership.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Mike Martin and Roland Schinzinger , "Ethics in Engineering", McGraw-Hill, New York, 2006.
2. R.S.Naagarazan, "A textbook on Professional Ethics and Human Values", New Age International Publishers, New Delhi, 2006.

REFERENCES:

1. Charles B. Fleddermann , "Engineering Ethics", Pearson Education / Prentice Hall, New Jersey, 2004 (Indian Reprint)
2. Charles E Harris, Michael S. Protchard and Michael J Rabins, "Engineering Ethics – Concepts and Cases", Wadsworth Thompson Learning, United States, 2000 (Indian Reprint now available)
3. John R Boatright, "Ethics and the Conduct of Business", Pearson Education, New Delhi, 2003.
4. Edmund G Seebauer and Robert L Barry, "Fundamentals of Ethics for Scientists and Engineers", Oxford University Press, Oxford, 2001.

Mapping of Course Outcome and Programme Outcome

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
3		x									x	
4	x	x							x	x	x	x
5	x				x				x	x	x	x

13CSX11 **HUMAN COMPUTER INTERACTIONS**

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:

On completion of this 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.

(9)

UNIT V INTERFACING APPLICATIONS

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: 45PERIODS

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 Outcome and Programme Outcome

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
3	x	x	x			x	x			x		
4	x		x	x			x		x	x		x
5	x		x	x			x					x

13ECX09 – HIGH SPEED NETWORKS

L	T	P	C
3	0	0	3

OBJECTIVES:

- To provide the basic concepts of frame relay and ATM networks.
- To know about the end to end performance parameters and techniques used by TCP.
- To update knowledge about the development in high speed networks.

COURSE OUTCOMES:

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

CO1: Understand the knowledge about Asynchronous transfer protocol and TCP/IP.
CO2: Identify different extents of quality of service to different applications.
CO3: Understand the advancement in protocols.
CO4: Analyze the different queuing techniques.
CO5: Acquire the knowledge about the progress of high speed networks.

UNIT I HIGH SPEED NETWORKS (9)

Frame Relay Networks – Asynchronous transfer mode: ATM Protocol Architecture, ATM logical Connection, ATM Cell – ATM Service Categories, AAL, High Speed LANs: Fast Ethernet, Gigabit Ethernet, Fiber Channel – Wireless LANs: applications, requirements, Architecture of 802.11

UNIT II CONGESTION AND TRAFFIC MANAGEMENT (9)

Queuing Analysis: Queuing Models, Single Server Queues – Effects of Congestion – Congestion Control – Traffic Management – Congestion Control in Packet Switching Networks – Frame Relay Congestion Control.

UNIT III TCP AND ATM CONGESTION CONTROL (9)

TCP Flow control – TCP Congestion Control: Retransmission Timer Management, Exponential RTO back off, KARN's Algorithm, Window management – Performance of TCP over ATM -Traffic and Congestion control in ATM – Requirements, Attributes, Traffic Management Frame work, Traffic Control .

UNIT IV INTEGRATED AND DIFFERENTIATED SERVICES (9)

Integrated Services Architecture: Approach, Components, Services- Queuing Discipline: FQ, PS, BRFQ, GPS, WFQ – Random Early Detection - Differentiated Services.

UNIT V PROTOCOLS FOR QOS SUPPORT (9)

RSVP: Goals & Characteristics, Data Flow, RSVP operations, Protocol Mechanisms – Multiprotocol Label Switching: Operations, Label Stacking – RTP – Protocol Architecture, Data Transfer Protocol, RTCP.

TOTAL: 45 PERIODS

TEXT BOOK :

1. William Stallings, "HIGH SPEED NETWORKS AND INTERNET", Pearson Education, Second Edition, 2010.

REFERENCES :

1. Warland, Pravin Varaiya, “High performance communication networks”, Second Edition, Jean Harcourt Asia Pvt. Ltd., , 2001.
2. Irvan Pepelnjk, Jim Guichard, Jeff Apcar, “MPLS and VPN architecture”, Cisco Press, Volume 1 and 2, 2003.
3. Abhijit S. Pandya, Ercan Sea, “ATM Technology for Broad Band Telecommunication Networks”, CRC Press, New York, 2004.
4. https://en.wikipedia.org/wiki/Multiprotocol_Label_Switching
5. http://www.cse.wustl.edu/~jain/cis788-95/ftp/atm_cong.pdf

Mapping of Course Outcome and Programme Outcome

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	x			x		
4	x			x					x	x		x
5	x		x	x			x					

13ITX13 **ETHICAL HACKING**

L	T	P	C
3	0	0	3

OBJECTIVE :

- It focuses on latest security threats, advanced attack vectors, and practical real time demonstration of the latest Hacking Techniques, methodologies, tools, tricks, and security measures.

COURSE OUTCOMES:

A student who successfully completes the course will have the ability to

CO1: Know about basic hacking tricks.
CO2: Know how to hack networking, web and password.
CO3: Know types of hacking attacks.
CO4: Know latest security threats and Hacking Techniques.
CO5: Develop knowledge of contemporary cyber security issues, and use techniques, skills and modern engineering tools necessary for computer security engineering practice.

UNIT I INTRODUCTION **(9)**

Hacking Windows: BIOS Passwords – Windows Login Passwords - Changing Windows Visuals – Cleaning Tracks – Internet Explorer users – Cookies – Netscape Communicator – Register - The Registry Editor – Description of reg file – other systems files – The Untold – Windows Tips – Tricks –Manual – Cleaning Recent Docs Menu and RUN MRU – Internet Explorer Tricks and Tips.

UNIT II NETWORK HACKING & WEB HACKING **(9)**

Network Hacking: Telnet – Domain Name Systems – Sockets and Ports – PING – Tracert – Netstat – Getting Information about a Domain – Port 23 – FTP Port – FTP Client – FTP commands – FTP Hacks. Web Hacking: HTTP Torn Apart – Get Method – Post Method –Head Method – Web Browser – Post Dial Up Screen Hacking – Making Own Browser – Removing Banners from Free ISPs – Difficult to Detect Port Scanner – GEOCITIES-TRIPOD – XOOM.

UNIT III PASSWORD HACKING **(9)**

Introduction – Password Cracking – Cracking the Windows – Glide Code – Windows Screen Saver Password – XOR – Internet Connection Password – Windows NT Password – Cracking Unix Password Files – HTTP authentication – BIOS Passwords – Cracking other passwords – Remote Access Sharing Password Decoding – Breaking DES Algorithm – Brute Force Password Cracking –Default Passwords.

UNIT IV ATTACKS **(9)**

Input Validation Attacks: The Art of Input Validation Attacks – Input Validation Dangers – Hotmail.com-Apache Web Server. Buffer Overflow Attacks: Types of Buffer Overflows – Basic Programming Errors. Privacy Attacks: Trojan Attacks – Detection – Countermeasures – Keylogger Attacks – Working.TCP/IP: Checksums – Packet Sequencing –Handshaking –Transport Layer – TCP/UDP Protocols – Link layer. Denial of Services Attacks: Ping of Death – DOS Attacks – Teardrop –SYN Attack – Smurf Attacks – UDP Flooding.

UNIT V PERL PROGRAMMING **(9)**

Basics – Scalars – Interacting with User by getting Input – Chomp and Chop – Operators – Exponentiation Operators – Binary Arithmetic Operators – Unary Arithmetic Operators – Conditional Statements – Other General Operators – Assignment Operators – Loops – Arrays – Input/output – Opening, Moving, Truncating Files – Accessing Directories.

TOTAL: 45 PERIODS

TEXT BOOK :

1. Ankit Fadia, "An Unofficial Guide To Ethical Hacking", Macmillan India Ltd, 2006.

REFERENCE :

1. Matt Walker, "CEH Certified Ethical Hacker All-in-One Exam Guide", Second Edition McGraw-Hill Osborne Media, 2014.

Mapping of Course Outcome and Programme Outcome

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
5		x			x				x			

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

List of Open Electives for

All B.E. / B.Tech. Programmes [R13]

(This Curriculum and Syllabi are applicable to Students admitted from the academic year 2013-2014 to 2014-2015)

JUNE 2015

Approved by third Academic council

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 Systems	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
13 GE Z05	Robo Design	2	0	0	2
13 GE Z06	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

*** This courses are applicable from Third semester onwards**

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 sprine 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 REPETETIVE 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 musculoskeltal 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 Yark, 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 – Lans 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 Protocils– 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 Phython 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 Poicy, 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 sped 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 gripers – 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.

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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

REFERENCES:

1. Ian Sinclair, “Sensor and Transducers”, Elsevier India Pvt Ltd, 3rd Edtion, 2011.
2. A.K. Sawhney, Puneeth sawhney, “A Course in Electrical and Electronic Measurements and Instrumentation”, Dhanpat Rai Publications, 2012.
3. Ernest O. Doeblin, “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 emphasis 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 – Direction 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 Reinfold 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: Design the wiring circuits and protection schemes for various types of electrical installations

CO2: Apply the electric drives and their power supply systems used in various types of electric traction applications

CO3: Acquire 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.

(Common to All Branches except EIE branch)

L	T	P	C
3	0	0	3

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, Responsitivity 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.

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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 D**EVELOPING 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 – Priortizing 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, Mikecotterell, "Software Project Management", Third Edition, Tata McGraw Hill, 2004.

REFERENCES:

1. Ramesh, Gopalaswamy, "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 PROTOCALS (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

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 d-evelopment 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 : INDIANS 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, Whitlach 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.

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

CO1. Identify the need for big data analytics for a domain.
CO2. Explore Hadoop distributed system and its components.
CO3. Install and utilize Hadoop tool.
CO4. 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 : NEWP RODUCT 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.

13GEZ07 ENERGY AUDITING

(*Common to All branches*)

L	T	P	C
2	0	0	2

COURSE OBJECTIVE:

- To familiarize the students about energy management and energy audit

COURSE OUTCOMES:

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

CO1: Fa miliarize about forms of energy

CO2: Un derstand energy management concepts

CO3: An alyze and report the outcome of energy audit

UNIT I : FUNDAMENTALS OF ENERGY **(6)**

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.

UNIT II : ENERGY MANAGEMENT **(6)**

Energy management: various approaches, cost effectiveness, bench marking, optimization of energy requirement and maximization of system efficiencies - Fuels and energy substitution

UNIT III : ENERGY AUDIT **(6)**

Energy audit : need, preliminary audit, detailed audit, methodology and approach - Instruments for audit, monitoring energy and energy savings.

UNIT IV : ASSESSMENT AND REPORTING **(6)**

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.

UNIT V : ENERGY SAVINGS CASE STUDY **(6)**

Case study: Simple calculations of energy savings and conservation in process equipments like boilers, heat exchangers only.

TOTAL : 30 PERIODS

TEXT BOOKS:

1. Paul. O. Callaghan., "Energy Management", McGraw-Hill Professional Publishing, 2003.
2. Albert Thumann, "Handbook of energy audits", 6th ed., The Fairmount Press, 2003.

REFERENCES:

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: Understand the concepts of energy management

CO2: Measure 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:

1. Reay.D.A, "Industrial energy conservation", Pergamon Press, 1st ed., 2003.
2. White.L.C, "Industrial Energy Management and Utilization", Hemisphere Publishers, 2002.

REFERENCES:

1. Smith.C.B, "Energy Management Principles", Pergamon Press, 2006.
2. Hamies, "Energy Auditing and Conservation; Methods, Measurements, Management and Case study", Hemisphere, 2003.
3. Trivedi. P.R and Jolka .K.R, " Energy Management", Common Wealth Publication, 2002.

13GEZ09 LAW FOR ENGINEERS

(*Common to All branches*)

L	T	P	C
2	0	0	2

OBJECTIVE

- 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 : 30PERIODS

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'sOutlines,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 sahni, 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

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 Einkaufzettel 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 ausdrucken
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*)

L	T	P	C
2	0	0	2

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