ANNA UNIVERSITY, CHENNAI

AFFILIATED INSTITUTIONS

R-2008

B.TECH. INFORMATION TECHNOLOGY
II - VIII SEMESTERS CURRICULA AND SYLLABI

SEMESTER II

SL. No.	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	HS2161	Technical English – II*	3	1	0	4
2.	MA2161	Mathematics – II*	3	1	0	4
3.	PH2161	Engineering Physics – II*	3	0	0	3
4.	CY2161	Engineering Chemistry – II*	3	0	0	3
5. a	ME2151	Engineering Mechanics **(For non-circuit branches)**	3	1	0	4
5. b	EE2151	Circuit Theory **(For branches under Electrical Faculty)**	3	1	0	4
5. c	EC2151	Electric Circuits and Electron Devices **(For branches under I & C Faculty)**	3	1	0	4
6. a	GE2151	Basic Electrical & Electronics Engineering **(For non-circuit branches)**	4	0	0	4
6. b	GE2152	Basic Civil & Mechanical Engineering **(For circuit branches)**	4	0	0	4
PRACTICAL						
7.	GE2155	Computer Practice Laboratory-II*	0	1	2	2
8.	GS2165	Physics & Chemistry Laboratory - II*	0	0	3	2
9. a	ME2155	Computer Aided Drafting and Modeling Laboratory	0	1	2	2

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		(For non-circuits branches)				
9. b	EE2155	Electrical Circuits Laboratory	0	0	3	2
		(For branches under Electrical Faculty)				
9. c	EC2155	Circuits and Devices Laboratory	0	0	3	2
		(For branches under I & C Faculty)				
					TOTAL : 28 CREDITS	
10.	-	English Language Laboratory [+]	0	0	2	-

* **Common to all B.E. / B.Tech. Programmes**

+ Offering English Language Laboratory as an additional subject (with no marks) during 2nd semester may be decided by the respective Colleges affiliated to Anna University Chennai.

A. CIRCUIT BRANCHES
I   Faculty of Electrical Engineering

   1. B.E. Electrical and Electronics Engineering
   2. B.E. Electronics and Instrumentation Engineering
   3. B.E. Instrumentation and Control Engineering

II   Faculty of Information and Communication Engineering

   1. B.E. Computer Science and Engineering
   2. B.E. Electronics and Communication Engineering
   3. B.E. Bio Medical Engineering
   4. B.Tech. Information Technology

B. NON – CIRCUIT BRANCHES
I   Faculty of Civil Engineering
   1. B.E. Civil Engineering

II   Faculty of Mechanical Engineering
   1. B.E. Aeronautical Engineering
   2. B.E. Automobile Engineering
   3. B.E. Marine Engineering
   4. B.E. Mechanical Engineering
   5. B.E. Production Engineering

III   Faculty of Technology
   1. B.Tech. Chemical Engineering
   2. B.Tech. Biotechnology
   3. B.Tech. Polymer Technology
   4. B.Tech. Textile Technology
   5. B.Tech. Textile Technology (Fashion Technology)
   6. B.Tech. Petroleum Engineering
   7. B.Tech. Plastics Technology

SEMESTER III

(Applicable to the students admitted from the Academic year 2008–2009 onwards)

Code No.	Course Title	L	T	P	C
THEORY					
MA 2211	Transforms and Partial Differential Equations	3	1	0	4
CS 2203	Object Oriented Programming	3	0	0	3
CS 2202	Digital Principles and Systems Design	3	1	0	4
IT 2201	Data Structures and Algorithms	3	0	0	3
IT 2202	Principles of Communication	3	1	0	4
GE 2021	Environmental Science & Engineering	3	0	0	3
PRACTICAL					
CS 2207	Digital Lab	0	0	3	2
IT 2205	Data Structures and Algorithms Lab	0	0	3	2
CS 2209	Object Oriented Programming Lab	0	0	3	2
	TOTAL	**18**	**3**	**9**	**27**

SEMESTER IV

(Applicable to the students admitted from the Academic year 2008–2009 onwards)

Code No.	Course Title	L	T	P	C
THEORY					
MA 2262	Probability and **Queueing** Theory	3	1	0	4
CS 2255	Database Management Systems	3	0	0	3
CS2252	Microprocessors **and** Microcontrollers	3	0	0	3
CS 2253	Computer Organization and Architecture	**3**	**0**	**0**	**3**
CS 2254	Operating Systems	3	0	0	3
IT 2251	Software Engineering and Quality Assurance	3	0	0	3
PRACTICAL					
CS 2258	Database Management Systems Lab	0	0	3	2
CS 2257	Operating System Lab	0	0	3	2
CS 2259	Microprocessors Lab	0	0	3	2
	TOTAL	**18**	**1**	**9**	**25**

SEMESTER V
(Applicable to the students admitted from the Academic year 2008–2009 onwards)

Code No.	Course Title	L	T	P	C
THEORY					
IT2301	Java Programming	3	0	0	3
MG2452	Engineering Economics & Financial Accounting	3	0	0	3
CS2304	System Software	3	1	0	4
CS2302	Computer Networks	3	0	0	3
CS2403	Digital Signal Processing	3	0	0	3
IT2302	Information Theory and Coding	3	0	0	3
PRACTICAL					
CS2308	System Software Lab	0	0	3	2
IT2305	Java Programming Lab	0	0	3	2
GE2321	Communication Skills Lab	0	0	4	2
	TOTAL	**18**	**1**	**10**	**25**

SEMESTER VI
(Applicable to the students admitted from the Academic year 2008–2009 onwards)

Code No.	Course Title	L	T	P	C
THEORY					
IT2351	Network Programming and Management	3	0	0	3
CS2353	Object Oriented Analysis and Design	3	0	0	3
IT2352	Cryptography and Network Security	3	0	0	3
IT2353	Web Technology	3	0	0	3
IT2354	Embedded Systems	3	0	0	3
	Elective I	3	0	0	3
PRACTICAL					
IT2357	Web Technology Lab	0	0	3	2
CS2357	Object Oriented Analysis and Design Lab	0	0	3	2
CS2307	Network Lab	0	0	3	2
	TOTAL	**18**	**0**	**9**	**24**

(Applicable to the students admitted from the Academic year 2008–2009 onwards)

Code No.	Course Title	L	T	P	C
THEORY					
IT2401	Service Oriented Architecture	3	0	0	3
IT2402	Mobile Communication	3	0	0	3
CS2401	Computer Graphics	3	0	0	3
IT2403	Software Project Management	3	0	0	3
	Elective II	3	0	0	3
	Elective III	3	0	0	3
PRACTICAL					
IT2406	Service Oriented Architecture Lab	0	0	3	2
CS2405	Computer Graphics Lab	0	0	3	2
	TOTAL	**18**	**0**	**6**	**22**

SEMESTER VIII

(Applicable to the students admitted from the Academic year 2008–2009 onwards)

Code No.	Course Title	L	T	P	C
THEORY					
	Elective IV	3	0	0	3
	Elective V	3	0	0	3
PRACTICAL					
IT2451	Project Work	0	0	12	6
	TOTAL	**6**	**0**	**12**	**12**

LIST OF ELECTIVES

SEMESTER VI – Elective I

Code No.	Course Title	L	T	P	C
MA2264	Numerical Methods	3	1	0	4
MA2265	Discrete Mathematics	3	1	0	4
IT2021	Business Process Model	3	0	0	3
IT2022	Software Requirement Engineering	3	0	0	3
IT2023	Digital Image Processing	3	0	0	3
IT2024	User Interface Design	3	0	0	3
CS2022	Visual Programming	3	0	0	3
CS2032	Data Warehousing and Data Mining	3	0	0	3

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SEMESTER VII – Elective II

Code No.	Course Title	L	T	P	C
CS2303	Theory of Computation	3	1	0	4
CS2029	Advanced Database Technology	3	0	0	3
IT2031	Electronic Commerce	3	0	0	3
IT2032	Software Testing	3	0	0	3
IT2033	Bioinformatics	3	0	0	3
IT2034	Adhoc Sensor Network	3	0	0	3

SEMESTER VII – Elective III

Code No.	Course Title	L	T	P	C
CS2351	Artificial Intelligence	3	0	0	3
IT2041	Enterprise Resource Planning	3	0	0	3
IT2042	Information Security	3	0	0	3
IT2043	Knowledge Management	3	0	0	3
CS2063	Grid computing	3	0	0	3
CS2041	C# and .NET Framework	3	0	0	3

SEMESTER VIII – Elective IV

Code No.	Course Title	L	T	P	C
IT2050	Principles of Compiler Design	3	0	0	3
IT2051	Knowledge Engineering	3	0	0	3
GE2025	Professional Ethics in Engineering	3	0	0	3
GE2071	Intellectual Property Rights	3	0	0	3
IT2052	Management Information System	3	0	0	3
IT2053	Software Design	3	0	0	3
CS2053	Soft Computing	3	0	0	3

SEMESTER VIII – Elective V

Code No.	Course Title	L	T	P	C
GE2022	Total Quality Management	3	0	0	3
GE2072	Indian Constitution and Society	3	0	0	3
IT2061	System Modeling and Simulation	3	0	0	3
CS2035	Natural Language Processing	3	0	0	3
CS2056	Distributed Systems	3	0	0	3
GE2023	Fundamental of Nano Science	3	0	0	3
IT2064	Speech Processing	3	0	0	3

HS2161   **TECHNICAL ENGLISH II**   **L T P C**
                                                                           3 1 0 4

AIM:
To encourage students to actively involve in participative learning of English and to help them acquire Communication Skills.

OBJECTIVES:
1. To help students develop listening skills for academic and professional purposes.
2. To help students acquire the ability to speak effectively in English in real-life situations.
3. To inculcate reading habit and to develop effective reading skills.
4. To help students improve their active and passive vocabulary.
5. To familiarize students with different rhetorical functions of scientific English.
6. To enable students write letters and reports effectively in formal and business situations.

UNIT I   **12**
Technical Vocabulary - meanings in context, sequencing words, Articles- Prepositions, intensive reading& predicting content, Reading and interpretation, extended definitions, Process description

SUGGESTED ACTIVITIES:
1. Exercises on word formation using the prefix 'self' - Gap filling with preposition.
2. Exercises - Using sequence words.
3. Reading comprehension exercise with questions based on inference – Reading headings
4. and predicting the content – Reading advertisements and interpretation.
5. Writing extended definitions – Writing descriptions of processes – Writing paragraphs based on discussions – Writing paragraphs describing the future.

UNIT II   **12**
Phrases / Structures indicating use / purpose – Adverbs-Skimming – Non-verbal communication - Listening – correlating verbal and non-verbal communication -Speaking in group discussions – Formal Letter writing – Writing analytical paragraphs.

SUGGESTED ACTIVITIES:
1. Reading comprehension exercises with questions on overall content – Discussions analyzing stylistic features (creative and factual description) - Reading comprehension exercises with texts including graphic communication - Exercises in interpreting non-verbal communication.
2. Listening comprehension exercises to categorise data in tables.
3. Writing formal letters, quotations, clarification, complaint – Letter seeking permission for Industrial visits– Writing analytical paragraphs on different debatable issues.

UNIT III   **12**
Cause and effect expressions – Different grammatical forms of the same word - Speaking – stress and intonation, Group Discussions - Reading – Critical reading - Listening, - Writing – using connectives, report writing – types, structure, data collection, content, form, recommendations .

SUGGESTED ACTIVITIES:
1. Exercises combining sentences using cause and effect expressions – Gap filling exercises using the appropriate tense forms – Making sentences using different grammatical forms of the same word. (Eg: object –verb / object – noun)
2. Speaking exercises involving the use of stress and intonation – Group discussions– analysis of problems and offering solutions.
3. Reading comprehension exercises with critical questions, Multiple choice question.
4. Sequencing of jumbled sentences using connectives – Writing different types of reports like industrial accident report and survey report – Writing recommendations.

UNIT IV   **12**

Numerical adjectives – Oral instructions – Descriptive writing – Argumentative paragraphs – Letter of application - content, format (CV / Bio-data) - Instructions, imperative forms - Checklists, Yes/No question form – E-mail communication.

SUGGESTED ACTIVITIES:
1. Rewriting exercises using numerical adjectives.
2. Reading comprehension exercises with analytical questions on content – Evaluation of content.
3. Listening comprehension – entering information in tabular form, intensive listening exercise and completing the steps of a process.
4. Speaking - Role play – group discussions – Activities giving oral instructions.
5. Writing descriptions, expanding hints – Writing argumentative paragraphs – Writing formal letters – Writing letter of application with CV/Bio-data – Writing general and safety instructions – Preparing checklists – Writing e-mail messages.

UNIT V   **9**

Speaking - Discussion of Problems and solutions - Creative and critical thinking – Writing an essay, Writing a proposal.

SUGGESTED ACTIVITIES:
1. Case Studies on problems and solutions
2. Brain storming and discussion
3. Writing Critical essays
4. Writing short proposals of 2 pages for starting a project, solving problems, etc.
5. Writing advertisements.

                                              TOTAL: 60 PERIODS

TEXT BOOK:
1. Chapters 5 – 8. Department of Humanities & Social Sciences, Anna University, 'English for Engineers and Technologists' Combined Edition (Volumes 1 & 2), Chennai: Orient Longman Pvt. Ltd., 2006. Themes 5 – 8 (Technology, Communication, Environment, Industry)

REFERENCES:
1. P. K. Dutt, G. Rajeevan and C.L.N Prakash, 'A Course in Communication Skills', Cambridge University Press, India 2007.
2. Krishna Mohan and Meera Banerjee, 'Developing Communication Skills', Macmillan India Ltd., (Reprinted 1994 – 2007).
3. Edgar Thorpe, Showick Thorpe, 'Objective English', Second Edition, Pearson Education, 2007.

EXTENSIVE READING:

1. Robin Sharma, 'The Monk Who Sold His Ferrari', Jaico Publishing House, 2007

NOTE:
The book listed under Extensive Reading is meant for inculcating the reading habit of the students. They need not be used for testing purposes.

MA2161	MATHEMATICS – II	L T P C
		3 1 0 4

UNIT I   ORDINARY DIFFERENTIAL EQUATIONS   12
Higher order linear differential equations with constant coefficients – Method of variation of parameters – Cauchy's and Legendre's linear equations – Simultaneous first order linear equations with constant coefficients.

UNIT II   VECTOR CALCULUS   12
Gradient Divergence and Curl – Directional derivative – Irrotational and solenoidal vector fields – Vector integration – Green's theorem in a plane, Gauss divergence theorem and stokes' theorem (excluding proofs) – Simple applications involving cubes and rectangular parallelpipeds.

UNIT III   ANALYTIC FUNCTIONS   12
Functions of a complex variable – Analytic functions – Necessary conditions, Cauchy – Riemann equation and Sufficient conditions (excluding proofs) – Harmonic and orthogonal properties of analytic function – Harmonic conjugate – Construction of analytic functions – Conformal mapping : w= z+c, cz, 1/z, and bilinear transformation.

UNIT IV   COMPLEX INTEGRATION   12
Complex integration – Statement and applications of Cauchy's integral theorem and Cauchy's integral formula – Taylor and Laurent expansions – Singular points – Residues – Residue theorem – Application of residue theorem to evaluate real integrals – Unit circle and semi-circular contour(excluding poles on boundaries).

UNIT V   LAPLACE TRANSFORM   12
Laplace transform – Conditions for existence – Transform of elementary functions – Basic properties – Transform of derivatives and integrals – Transform of unit step function and impulse functions – Transform of periodic functions.

Definition of Inverse Laplace transform as contour integral – Convolution theorem (excluding proof) – Initial and Final value theorems – Solution of linear ODE of second order with constant coefficients using Laplace transformation techniques.

**   TOTAL : 60 PERIODS**
TEXT BOOK

1. Bali N. P and Manish Goyal, "Text book of Engineering Mathematics", 3rd Edition, Laxmi Publications (p) Ltd., (2008).
2. Grewal. B.S, "Higher Engineering Mathematics", 40th Edition, Khanna Publications, Delhi, (2007).

REFERENCES:

1. Ramana B.V, "Higher Engineering Mathematics",Tata McGraw Hill Publishing Company, New Delhi, (2007).
2. Glyn James, "Advanced Engineering Mathematics", 3rd Edition, Pearson Education, (2007).
3. Erwin Kreyszig, "Advanced Engineering Mathematics", 7th Edition, Wiley India, (2007).
4. Jain R.K and Iyengar S.R.K, "Advanced Engineering Mathematics", 3rd Edition, Narosa Publishing House Pvt. Ltd., (2007).

PH2161 **ENGINEERING PHYSICS – II** **L T P C**
3 0 0 3

UNIT I   CONDUCTING MATERIALS   9
Conductors – classical free electron theory of metals – Electrical and thermal conductivity – Wiedemann – Franz law – Lorentz number – Draw backs of classical theory – Quantum theory – Fermi distribution function – Effect of temperature on Fermi Function – Density of energy states – carrier concentration in metals.

UNIT II   SEMICONDUCTING MATERIALS   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.

TEXT BOOKS:
1. Charles Kittel ' Introduction to Solid State Physics', John Wiley & sons, 7th edition, Singapore (2007)
2. Charles P. Poole and Frank J.Ownen, 'Introduction to Nanotechnology', Wiley India(2007) (for Unit V)

REFERENCES:
1. Rajendran, V, and Marikani A, 'Materials science'Tata McGraw Hill publications, (2004) New delhi.
2. Jayakumar, S. 'Materials science', R.K. Publishers, Coimbatore, (2008).
3. Palanisamy P.K, 'Materials science', Scitech publications(India) Pvt. LTd., Chennai, second Edition(2007)
4. M. Arumugam, 'Materials Science' Anuradha publications, Kumbakonam, (2006).

CY2161   **ENGINEERING CHEMISTRY – II**   **L T P C**
                                                                     3 0 0 3

AIM
To impart a sound knowledge on the principles of chemistry involving the different application oriented topics required for all engineering branches.

OBJECTIVES
• The student should be conversant with the principles electrochemistry,
   electrochemical cells, emf and applications of emf measurements.
• Principles of corrosion control
• Chemistry of Fuels and combustion
• Industrial importance of Phase rule and alloys
• Analytical techniques and their importance.

UNIT I   ELECTROCHEMISTRY   9
Electrochemical cells – reversible and irreversible cells – EMF – measurement of emf – Single electrode potential – Nernst equation (problem) – reference electrodes –Standard Hydrogen electrode -Calomel electrode – Ion selective electrode – glass electrode and measurement of pH – electrochemical series – significance – potentiometer titrations (redox - Fe^{2+} vs dichromate and precipitation – Ag^+ vs Cl^- titrations) and conduct metric titrations (acid-base – HCl vs, NaOH) titrations,

UNIT II   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 III   FUELS AND COMBUSTION   9

Calorific value – classification – Coal – proximate and ultimate analysis metallurgical coke – manufacture by Otto-Hoffmann method – Petroleum processing and fractions – cracking – catalytic cracking and methods-knocking – octane number and cetane number – synthetic petrol – Fischer Tropsch and Bergius processes – Gaseous fuels-water gas, producer gas, CNG and LPG, Flue gas analysis – Orsat apparatus – theoretical air for combustion.

UNIT IV   PHASE RULE AND ALLOYS   9

Statement and explanation of terms involved – one component system – water system – condensed phase rule – construction of phase diagram by thermal analysis – simple eutectic systems (lead-silver system only) – alloys – importance, ferrous alloys – nichrome and stainless steel – heat treatment of steel, non-ferrous alloys – brass and bronze.

UNIT V   ANALYTICAL TECHNIQUES   9

Beer-Lambert's law (problem) – UV-visible spectroscopy and IR spectroscopy – principles – instrumentation (problem) (block diagram only) – estimation of iron by colorimetry – flame photometry – principle – instrumentation (block diagram only) – estimation of sodium by flame photometry – atomic absorption spectroscopy – principles – instrumentation (block diagram only) – estimation of nickel by atomic absorption spectroscopy.

TOTAL: 45 PERIODS

TEXT BOOKS

1. P.C.Jain and Monica Jain, "Engineering Chemistry" Dhanpat Rai Pub, Co., New Delhi (2002).
2. S.S.Dara "A text book of Engineering Chemistry" S.Chand & Co.Ltd., New Delhi (2006).

REFERENCES

1. B.Sivasankar "Engineering Chemistry" Tata McGraw-Hill Pub.Co.Ltd, New Delhi (2008).
2. B.K.Sharma "Engineering Chemistry" Krishna Prakasan Media (P) Ltd., Meerut (2001).

ME2151   **ENGINEERING MECHANICS**   **L T P C**
                                                                 3 1 0 4

OBJECTIVE :
At the end of this course the student should be able to understand the vectorial and scalar representation of forces and moments, static equilibrium of particles and rigid bodies both in two dimensions and also in three dimensions. Further, he should understand the principle of work and energy. He should be able to comprehend the effect of friction on equilibrium. He should be able to understand the laws of motion, the kinematics of motion and the interrelationship. He should also be able to write the dynamic equilibrium equation. All these should be achieved both conceptually and through solved examples.

UNIT I   BASICS & STATICS OF PARTICLES   12
Introduction – Units and Dimensions – Laws of Mechanics – Lame's theorem, Parallelogram and triangular Law of forces – Vectors – Vectorial representation of forces and moments – Vector operations: additions, subtraction, dot product, cross product – Coplanar Forces – Resolution and Composition of forces – Equilibrium of a particle – Forces in space – Equilibrium of a particle in space – Equivalent systems of forces – Principle of transmissibility – Single equivalent force.

UNIT II   EQUILIBRIUM OF RIGID BODIES   12
Free body diagram – Types of supports and their reactions – requirements of stable equilibrium – Moments and Couples – Moment of a force about a point and about an axis – Vectorial representation of moments and couples – Scalar components of a moment – Varignon's theorem – Equilibrium of Rigid bodies in two dimensions – Equilibrium of Rigid bodies in three dimensions – Examples

UNIT III   PROPERTIES OF SURFACES AND SOLIDS   12
Determination of Areas and Volumes – First moment of area and the Centroid of sections – Rectangle, circle, triangle from integration – T section, I section, - Angle section, Hollow section by using standard formula – second and product moments of plane area – Rectangle, triangle, circle from integration – T section, I section, Angle section, Hollow section by using standard formula – Parallel axis theorem and perpendicular axis theorem – Polar moment of inertia – Principal moments of inertia of plane areas – Principal axes of inertia – Mass moment of inertia – Derivation of mass moment of inertia for rectangular section, prism, sphere from first principle – Relation to area moments of inertia.

UNIT IV   DYNAMICS OF PARTICLES   12
Displacements, Velocity and acceleration, their relationship – Relative motion – Curvilinear motion – Newton's law – Work Energy Equation of particles – Impulse and Momentum – Impact of elastic bodies.

UNIT V   FRICTION AND ELEMENTS OF RIGID BODY DYNAMICS   12
Frictional force – Laws of Coloumb friction – simple contact friction – Rolling resistance – Belt friction.
Translation and Rotation of Rigid Bodies – Velocity and acceleration – General Plane motion.

                                                        TOTAL: 60 PERIODS

TEXT BOOK

1. Beer, F.P and Johnson Jr. E.R. "Vector Mechanics for Engineers", Vol. 1 Statics and Vol. 2 Dynamics, McGraw-Hill International Edition, (1997).

REFERENCES

1. Rajasekaran, S, Sankarasubramanian, G., "Fundamentals of Engineering Mechanics", Vikas Publishing House Pvt. Ltd., (2000).
2. Hibbeller, R.C., "Engineering Mechanics", Vol. 1 Statics, Vol. 2 Dynamics, Pearson Education Asia Pvt. Ltd., (2000).
3. Palanichamy, M.S., Nagam, S., "Engineering Mechanics – Statics & Dynamics", Tata McGraw-Hill, (2001).
4. Irving H. Shames, "Engineering Mechanics – Statics and Dynamics", IV Edition – Pearson Education Asia Pvt. Ltd., (2003).
5. Ashok Gupta, "Interactive Engineering Mechanics – Statics – A Virtual Tutor (CDROM)", Pearson Education Asia Pvt., Ltd., (2002).

EE2151　　　　　　　　　　**CIRCUIT THEORY**　　　　　　**L T P C**
　　　　　　　　(Common to EEE, EIE and ICE Branches)　　　　**3 1 0 4**

UNIT I　　　BASIC CIRCUITS ANALYSIS　　　　　　　　　　　　　　12
Ohm's Law – Kirchoffs laws – DC and AC Circuits – Resistors in series and parallel circuits – Mesh current and node voltage method of analysis for D.C and A.C. circuits.

UNIT II　　　NETWORK REDUCTION AND NETWORK THEOREMS FOR DC AND AC CIRCUITS:　　　　　　　　　　　　　　　　　12
Network reduction: voltage and current division, source transformation – star delta conversion.
Thevenins and Novton & Theorem – Superposition Theorem – Maximum power transfer theorem – Reciprocity Theorem.

UNIT III　　　RESONANCE AND COUPLED CIRCUITS　　　　　　　　12
Series and paralled resonance – their frequency response – Quality factor and Bandwidth - Self and mutual inductance – Coefficient of coupling – Tuned circuits – Single tuned circuits.

UNIT IV　　　TRANSIENT RESPONSE FOR DC CIRCUITS　　　　　　　12
Transient response of RL, RC and RLC Circuits using Laplace transform for DC input and A.C. with sinusoidal input.

UNIT V　　　ANALYSING THREE PHASE CIRCUITS　　　　　　　　　12
Three phase balanced / unbalanced voltage sources – analysis of three phase 3-wire and 4-wire circuits with star and delta connected loads, balanced & un balanced – phasor diagram of voltages and currents – power and power factor measurements in three phase circuits.

TOTAL: 60 PERIODS

TEXT BOOKS:

1. William H. Hayt Jr, Jack E. Kemmerly and Steven M. Durbin, "Engineering Circuits Analysis",Tata McGraw Hill publishers, 6th edition, New Delhi, (2002).
2. Sudhakar A and Shyam Mohan SP, "Circuits and Network Analysis and Synthesis",Tata McGraw Hill, (2007).

REFERENCES:

1. Paranjothi SR, "Electric Circuits Analysis," New Age International Ltd., New Delhi, (1996).
2. Joseph A. Edminister, Mahmood Nahri, "Electric circuits", Schaum's series, Tata McGraw-Hill, New Delhi (2001).
3. Chakrabati A, "Circuits Theory (Analysis and synthesis), Dhanpath Rai & Sons, New Delhi, (1999).
4. Charles K. Alexander, Mathew N.O. Sadik, "Fundamentals of Electric Circuits", Second Edition, McGraw Hill, (2003).

EC2151   ELECTRIC CIRCUITS AND ELECTRON DEVICES   L T P C
             (For ECE, CSE, IT and Biomedical Engg. Branches)   **3 1 0 4**

UNIT I   CIRCUIT ANALYSIS TECHNIQUES   12
Kirchoff's current and voltage laws – series and parallel connection of independent sources – R, L and C – Network Theorems – Thevenin, Superposition, Norton, Maximum power transfer and duality – Star-delta conversion.

UNIT II   TRANSIENT RESONANCE IN RLC CIRCUITS   12
Basic RL, RC and RLC circuits and their responses to pulse and sinusoidal inputs – frequency response – Parallel and series resonances – Q factor – single tuned and double tuned circuits.

UNIT III   SEMICONDUCTOR DIODES   12
Review of intrinsic & extrinsic semiconductors – Theory of PN junction diode – Energy band structure – current equation – space charge and diffusion capacitances – effect of temperature and breakdown mechanism – Zener diode and its characteristics.

UNIT IV   TRANSISTORS   12
Principle of operation of PNP and NPN transistors – study of CE, CB and CC configurations and comparison of their characteristics – Breakdown in transistors – operation and comparison of N-Channel and P-Channel JFET – drain current equation – MOSFET – Enhancement and depletion types – structure and operation – comparison of BJT with MOSFET – thermal effect on MOSFET.

UNIT V   SPECIAL SEMICONDUCTOR DEVICES
(Qualitative Treatment only)   12
Tunnel diodes – PIN diode, varactor diode – SCR characteristics and two transistor equivalent model – UJT – Diac and Triac – Laser, CCD, Photodiode, Phototransistor, Photoconductive and Photovoltaic cells – LED, LCD.

TOTAL : 60 PERIODS

15

TEXT BOOKS:
1. Joseph A. Edminister, Mahmood, Nahri, "Electric Circuits" – Shaum series,Tata McGraw Hill, (2001)
2. S. Salivahanan, N. Suresh kumar and A. Vallavanraj, "Electronic Devices and Circuits",Tata McGraw Hill, 2nd Edition, (2008).
3. David A. Bell, "Electronic Devices and Circuits", Oxford University Press, 5th Edition, (2008).

REFERENCES:
1. Robert T. Paynter, "Introducing Electronics Devices and Circuits", Pearson Education, 7th Education, (2006).
2. William H. Hayt, J.V. Jack, E. Kemmebly and steven M. Durbin, "Engineering Circuit Analysis",Tata McGraw Hill, 6th Edition, 2002.
3. J. Millman & Halkins, Satyebranta Jit, "Electronic Devices & Circuits",Tata McGraw Hill, 2nd Edition, 2008.

GE2151   BASIC ELECTRICAL AND ELECTRONICS ENGINEERING   L T P C
        (Common to branches under Civil, Mechanical and Technology faculty)   **3 0 0 3**

UNIT I   ELECTRICAL CIRCUITS & MEASURMENTS   12
Ohm's Law – Kirchoff's Laws – Steady State Solution of DC Circuits – Introduction to AC Circuits – Waveforms and RMS Value – Power and Power factor – Single Phase and Three Phase Balanced Circuits.

Operating Principles of Moving Coil and Moving Iron Instruments (Ammeters and Voltmeters), Dynamometer type Watt meters and Energy meters.

UNIT II   ELECTRICAL MECHANICS   12
Construction, Principle of Operation, Basic Equations and Applications of DC Generators, DC Motors, Single Phase Transformer, single phase induction Motor.

UNIT III   SEMICONDUCTOR DEVICES AND APPLICATIONS   12
Characteristics of PN Junction Diode – Zener Effect – Zener Diode and its Characteristics – Half wave and Full wave Rectifiers – Voltage Regulation.

Bipolar Junction Transistor – CB, CE, CC Configurations and Characteristics – Elementary Treatment of Small Signal Amplifier.

UNIT IV   DIGITAL ELECTRONICS   12
Binary Number System – Logic Gates – Boolean Algebra – Half and Full Adders – Flip-Flops – Registers and Counters – A/D and D/A Conversion (single concepts)

UNIT V   FUNDAMENTALS OF COMMUNICATION ENGINEERING   12
Types of Signals: Analog and Digital Signals – Modulation and Demodulation: Principles of Amplitude and Frequency Modulations.

Communication Systems: Radio, TV, Fax, Microwave, Satellite and Optical Fibre (Block Diagram Approach only).

                                                                  TOTAL: 60 PERIODS

TEXT BOOKS :
1. V.N. Mittle "Basic Electrical Engineering",Tata McGraw Hill Edition, New Delhi, 1990.
2. R.S. Sedha, "Applied Electronics" S. Chand & Co., 2006.

REFERENCES:
1. Muthusubramanian R, Salivahanan S and Muraleedharan K A, "Basic Electrical, Electronics and Computer Engineering",Tata McGraw Hill, Second Edition, (2006).
2. Nagsarkar T K and Sukhija M S, "Basics of Electrical Engineering", Oxford press (2005).
3. Mehta V K, "Principles of Electronics", S.Chand & Company Ltd, (1994).
4. Mahmood Nahvi and Joseph A. Edminister, "Electric Circuits", Schaum' Outline Series, McGraw Hill, (2002).
5. Premkumar N, "Basic Electrical Engineering", Anuradha Publishers, (2003).

GE2152　　　**BASIC CIVIL & MECHANICAL ENGINEERING**　　**L T P C**
　　　　　　　(Common to branches under Electrical and I & C Faculty)　　**4 0 0 4**

A – CIVIL ENGINEERING

UNIT I　　**SURVEYING AND CIVIL ENGINEERING MATERIALS**　　　　**15**

SURVEYING: Objects – types – classification – principles – measurements of distances – angles – leveling – determination of areas – illustrative examples.

CIVIL ENGINEERING MATERIALS: Bricks – stones – sand – cement – concrete – steel sections.

UNIT II　　**BUILDING COMPONENTS AND STRUCTURES**　　　　　**15**

FOUNDATIONS: Types, Bearing capacity – Requirement of good foundations.

SUPERSTRUCTURE: Brick masonry – stone masonry – beams – columns – lintels – roofing – flooring – plastering – Mechanics – Internal and external forces – stress – strain – elasticity – Types of Bridges and Dams – Basics of Interior Design and Landscaping.

TOTAL : 30 PERIODS

B – MECHANICAL ENGINEERING

UNIT III　　**POWER PLANT ENGINEERING**　　　　　　　　**10**
Introduction, Classification of Power Plants – Working principle of steam, Gas, Diesel, Hydro-electric and Nuclear Power plants – Merits and Demerits – Pumps and turbines – working principle of Reciprocating pumps (single acting and double acting) – Centrifugal Pump.

UNIT IV   I C ENGINES   10

Internal combustion engines as automobile power plant – Working principle of Petrol and Diesel Engines – Four stroke and two stroke cycles – Comparison of four stroke and two stroke engines – Boiler as a power plant.

UNIT V   REFRIGERATION AND AIR CONDITIONING SYSTEM   10

Terminology of Refrigeration and Air Conditioning. Principle of vapour compression and absorption system – Layout of typical domestic refrigerator – Window and Split type room Air conditioner.

TOTAL: 30 PERIODS

REFERENCES

 1. Shanmugam G and Palanichamy M S, "Basic Civil and MechanicalEngineering",Tata McGraw Hill Publishing Co., New Delhi, (1996).
2. Ramamrutham. S, "Basic Civil Engineering", Dhanpat Rai Publishing Co. (P) Ltd. (1999).
3. Seetharaman S. "Basic Civil Engineering", Anuradha Agencies, (2005).
4. Venugopal K and Prahu Raja V, "Basic Mechanical Engineering", Anuradha Publishers, Kumbakonam, (2000).
5. Shantha Kumar S R J., "Basic Mechanical Engineering", Hi-tech Publications, Mayiladuthurai, (2000).

GE2155   COMPUTER PRACTICE LABORATORY – II   L T P C
**   0 1 2 2**

LIST OF EXPERIMENTS

1. UNIX COMMANDS   15

Study of Unix OS - Basic Shell Commands - Unix Editor

2. SHELL PROGRAMMING   15

Simple Shell program - Conditional Statements - Testing and Loops

3. C PROGRAMMING ON UNIX   15

Dynamic Storage Allocation-Pointers-Functions-File Handling

TOTAL : 45 PERIODS

HARDWARE / SOFTWARE REQUIREMENTS FOR A BATCH OF 30 STUDENTS

Hardware
- 1 UNIX Clone Server
- 33 Nodes (thin client or PCs)
- Printer – 3 Nos.

Software
- OS – UNIX Clone (33 user license or License free Linux)
- Compiler - C

GS2165   **PHYSICS LABORATORY – II**   **L T P C**
                                                               0 0 3 2

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 specific resistance of a given coil of wire – Carey Foster   Bridge.

4. Determination of viscosity of liquid – Poiseuille's method.

5. Spectrometer dispersive power of a prism.

6. Determination of Young's modulus of the material – uniform bending.

7. Torsional pendulum – Determination of rigidity modulus.

• **A minimum of FIVE experiments shall be offered.**

• **Laboratory classes on alternate weeks for Physics and Chemistry.**

• **The lab examinations will be held only in the second semester.**

GS2165   **CHEMISTRY LABORATORY – II**   **L T P C**
                                                               0 0 3 2

LIST OF EXPERIMENTS

1. Conduct metric titration (Simple acid base)

2. Conduct metric titration (Mixture of weak and strong acids)

3. Conduct metric titration using $BaCl_2$ vs Na_2SO_4

4. Potentiometric Titration (Fe^{2+} / $KMnO_4$ or $K_2Cr_2O_7$)

5. PH titration (acid & base)

6. Determination of water of crystallization of a crystalline salt (Copper   sulphate)

7. Estimation of Ferric iron by spectrophotometry.

• **A minimum of FIVE experiments shall be offered.**

• **Laboratory classes on alternate weeks for Physics and Chemistry.**

• **The lab examinations will be held only in the second semester.**

ME2155   **COMPUTER AIDED DRAFTING AND MODELING**   **L T P C**
               LABORATORY   **0 1 2 2**

List of Exercises using software capable of Drafting and Modeling

1. Study of capabilities of software for Drafting and Modeling – Coordinate systems (absolute, relative, polar, etc.) – Creation of simple figures like polygon and general multi-line figures.

2. Drawing of a Title Block with necessary text and projection symbol.

3. Drawing of curves like parabola, spiral, involute using Bspline or cubic spline.

4. Drawing of front view and top view of simple solids like prism, pyramid, cylinder, cone, etc, and dimensioning.

5. Drawing front view, top view and side view of objects from the given pictorial views (eg. V-block, Base of a mixie, Simple stool, Objects with hole and curves).

6. Drawing of a plan of residential building (Two bed rooms, kitchen, hall, etc.)

7. Drawing of a simple steel truss.

8. Drawing sectional views of prism, pyramid, cylinder, cone, etc,

9. Drawing isometric projection of simple objects.

10. Creation of 3-D models of simple objects and obtaining 2-D multi-view drawings from 3-D model.

Note: Plotting of drawings must be made for each exercise and attached to the records written by students.

List of Equipments for a batch of 30 students:

1. Pentium IV computer or better hardware, with suitable graphics facility -30 No.
2. Licensed software for Drafting and Modeling. – 30 Licenses
3. Laser Printer or Plotter to print / plot drawings – 2 No.

EE2155   **ELECTRICAL CIRCUIT LABORATORY**   **L T P C**
                        (Common to EEE, EIE and ICE)   **0 0 3 2**

LIST OF EXPERIMENTS

1. Verification of ohm's laws and kirchoff's laws.

2. Verification of Thevemin's and Norton's Theorem

3. Verification of superposition Theorem

4. Verification of maximum power transfer theorem.

5. Verification of reciprocity theorem

6. Measurement of self inductance of a coil

7. Verification of mesh and nodal analysis.

8. Transient response of RL and RC circuits for DC input.

9. Frequency response of series and parallel resonance circuits.

10. Frequency response of single tuned coupled circuits.

TOTAL: 45 PERIODS

EC2155   **CIRCUITS AND DEVICES LABORATORY**   **L T P C**
                                                                                       0 0 3 2

1. Verification of KVL and KCL

2. Verification of Thevenin and Norton Theorems.

3. Verification of superposition Theorem.

4. Verification of Maximum power transfer and reciprocity theorems.

5. Frequency response of series and parallel resonance circuits.

6. Characteristics of PN and Zener diode

7. Characteristics of CE configuration

8. Characteristics of CB configuration

9. Characteristics of UJT and SCR

10. Characteristics of JFET and MOSFET

11. Characteristics of Diac and Triac.

12. Characteristics of Photodiode and Phototransistor.

                                                                    TOTAL : 45 PERIODS

ENGLISH LANGUAGE LABORATORY (Optional)   **L T P C**
                                                               0 0 2 -
1. LISTENING: **5**
Listening & answering questions – gap filling – Listening and Note taking- Listening to telephone conversations

2. SPEAKING: **5**
Pronouncing words & sentences correctly – word stress – Conversation practice.

CLASSROOM SESSION   **20**
1. Speaking: Introducing oneself, Introducing others, Role play, Debate- Presentations:
   Body language, gestures, postures.
   Group Discussions etc
2. Goal setting – interviews – stress time management – situational reasons

  Evaluation
             (1)   Lab Session – 40 marks
                   Listening   – 10 marks
                   Speaking   – 10 marks
                   Reading   – 10 marks
                   Writing   – 10 marks
               (2)   Classroom Session – 60 marks
                   Role play activities giving real life context   – 30 marks
                   Presentation   – 30 marks

    Note on Evaluation
    1. Examples for role play situations:
        a. Marketing engineer convincing a customer to buy his product.
        b. Telephone conversation – Fixing an official appointment / Enquiry on
           availability of flight or train tickets / placing an order. etc.

2. Presentations could be just a Minute (JAM activity) or an Extempore on
   simple topics or visuals could be provided and students could be asked to
   talk about it.

REFERENCES

1. Hartley, Peter, Group Communication, London: Routledge, (2004).
2. Doff, Adrian and Christopher Jones, Language in Use – (Intermediate level),
   Cambridge University Press, (1994).
3. Gammidge, Mick, Speaking Extra – A resource book of multi-level skills activities ,
   Cambridge University Press, (2004).
4. Craven, Miles, Listening Extra - A resource book of multi-level skills activities,
   Cambridge, Cambridge University Press, (2004).
5. Naterop, Jean & Rod Revell, Telephoning in English, Cambridge University Press,
   (1987).

LAB REQUIREMENTS
1. Teacher – Console and systems for students
2. English Language Lab Software
3. Tape Recorders.

MA 2211   TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS   L T P C
(Common to all branches)   3 1 0 4

OBJECTIVES
The course objective is to develop the skills of the students in the areas of Transforms
and Partial Differtial 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. The course will also serve as a prerequisite
for post graduate and specialized studies and research.

UNIT I   FOURIER SERIES   9 + 3
Dirichlet's conditions – General Fourier series – Odd and even functions – Half range
sine series – Half range cosine series – Complex form of Fourier Series – Parseval's
identify – Harmonic Analysis.

UNIT II   FOURIER TRANSFORMS   9 + 3
Fourier integral theorem (without proof) – Fourier transform pair – Sine and
Cosine transforms – Properties – Transforms of simple functions – Convolution theorem
– Parseval's identity.

UNIT III   PARTIAL DIFFERENTIAL EQUATIONS   9 + 3
Formation of partial differential equations – Lagrange's linear equation – Solutions of
standard types of first order partial differential equations - Linear partial differential
equations of second and higher order with constant coefficients.

UNIT IV   APPLICATIONS OF PARTIAL DIFFERENTIAL EQUATIONS   9 + 3
Solutions of one dimensional wave equation – One dimensional equation of heat
conduction – Steady state solution of two-dimensional equation of heat conduction
(Insulated edges excluded) – Fourier series solutions in cartesian coordinates.

UNIT V   Z -TRANSFORMS AND DIFFERENCE EQUATIONS   9 + 3

Z-transforms - Elementary properties – Inverse Z-transform – Convolution theorem - Formation of difference equations – Solution of difference equations using Z-transform.

LECTURES : 45 TUTORIALS : 15 TOTAL : 60 PERIODS

TEXT BOOK:
1. Grewal, B.S, 'Higher Engineering Mathematics' 40th Edition, Khanna publishers, Delhi, (2007)

REFERENCES:
1. Bali.N.P and Manish Goyal 'A Textbook of Engineering Mathematics', Seventh Edition, Laxmi Publications(P) Ltd. (2007)
2. Ramana.B.V. 'Higher Engineering Mathematics' Tata Mc-GrawHill Publishing Company limited, New Delhi (2007).
3. Glyn James, 'Advanced Modern Engineering Mathematics', Third edition-Pearson Education (2007).
4. Erwin Kreyszig 'Advanced Engineering Mathematics', Eighth edition-Wiley India (2007).

CS2203   OBJECT ORIENTED PROGRAMMING   L T P C
(Common to CSE & IT)   3 0 0 3

AIM

To understand the concepts of object-oriented programming and master OOP using C++.

UNIT I   9

Object oriented programming concepts – objects – classes – methods and messages – abstraction and encapsulation – inheritance – abstract classes – polymorphism.
Introduction to C++ – classes – access specifiers – function and data members – default arguments – function overloading – friend functions – const and volatile functions - static members – Objects – pointers and objects – constant objects – nested classes – local classes

UNIT II   9

Constructors – default constructor – Parameterized constructors – Constructor with dynamic allocation – copy constructor – destructors – operator overloading – overloading through friend functions – overloading the assignment operator – type conversion – explicit constructor

UNIT III   9

Function and class templates - Exception handling – try-catch-throw paradigm – exception specification – terminate and Unexpected functions – Uncaught exception.

UNIT IV   9

Inheritance – public, private, and protected derivations – multiple inheritance - virtual base class – abstract class – composite objects Runtime polymorphism – virtual functions – pure virtual functions – RTTI – typeid – dynamic casting – RTTI and templates – cross casting – down casting .

UNIT V   **9**
Streams and formatted I/O – I/O manipulators - file handling – random access – object serialization – namespaces - std namespace – ANSI String Objects – standard template library.

TOTAL: 45 PERIODS

TEXT BOOK:
1. B. Trivedi, "Programming with ANSI C++", Oxford University Press, 2007.

REFERENCES:
1. Ira Pohl, "Object Oriented Programming using C++", Pearson Education, Second Edition Reprint 2004..
2. S. B. Lippman, Josee Lajoie, Barbara E. Moo, "C++ Primer", Fourth Edition, Pearson Education, 2005.
3. B. Stroustrup, "The C++ Programming language", Third edition, Pearson Education, 2004.

CS 2202   **DIGITAL PRINCIPLES AND SYSTEM DESIGN**   **L T P C**
                          (Common to CSE & IT)   **3 1 0 4**

AIM

To provide an in-depth knowledge of the design of digital circuits and the use of Hardware Description Language in digital system design.

OBJECTIVES

*   To understand different methods used for the simplification of Boolean functions
*   To design and implement combinational circuits
*   To design and implement synchronous sequential circuits
*   To design and implement asynchronous sequential circuits
*   To study the fundamentals of VHDL / Verilog HDL

UNIT I   BOOLEAN ALGEBRA AND LOGIC GATES   8
Review of binary number systems - Binary arithmetic – Binary codes – Boolean algebra and theorems - Boolean functions – Simplifications of Boolean functions using Karnaugh map and tabulation methods – Logic gates

UNIT II   COMBINATIONAL LOGIC   9
Combinational circuits – Analysis and design procedures - Circuits for arithmetic operations - Code conversion – Introduction to Hardware Description Language (HDL)

UNIT III   DESIGN WITH MSI DEVICES   8
Decoders and encoders - Multiplexers and demultiplexers - Memory and programmable logic - HDL for combinational circuits

UNIT IV   SYNCHRONOUS SEQUENTIAL LOGIC   10
Sequential circuits – Flip flops – Analysis and design procedures - State reduction and state assignment - Shift registers – Counters – HDL for Sequential Circuits.

UNIT V   ASYNCHRONOUS SEQUENTIAL LOGIC   10

Analysis and design of asynchronous sequential circuits - Reduction of state and flow tables – Race-free state assignment – Hazards. ASM Chart

TUTORIAL: 15   TOTAL : 60PERIODS

TEXT BOOK:
1. M.Morris Mano, "Digital Design", 3rd edition, Pearson Education, 2007.

REFERENCES:
1. Charles H.Roth, Jr. "Fundamentals of Logic Design", 4th Edition, Jaico Publishing House, Latest Edition.
2. Donald D.Givone, "Digital Principles and Design", Tata McGraw-Hill, 2007.

IT 2201   DATA STRUCTURES AND ALGORITHMS   L T P C
                                                              3 0 0 3

AIM
To master the design and applications of linear, tree, and graph structures. To understand various algorithm design and analysis techniques.

UNIT I   LINEAR STRUCTURES   9
Abstract Data Types (ADT) – List ADT – array-based implementation – linked list implementation – cursor-based linked lists – doubly-linked lists – applications of lists – Stack ADT – Queue ADT – circular queue implementation – Applications of stacks and queues

UNIT II   TREE STRUCTURES   9
Tree ADT – tree traversals – left child right sibling data structures for general trees – Binary Tree ADT – expression trees – applications of trees – binary search tree ADT – AVL trees – binary heaps

UNIT III   HASHING AND SETS   9
Hashing – Separate chaining – open addressing – rehashing – extendible hashing – Disjoint Set ADT – dynamic equivalence problem – smart union algorithms – path compression – applications of Sets

UNIT IV   GRAPHS   9
Definitions – Topological sort – breadth-first traversal - shortest-path algorithms – minimum spanning tree – Prim's and Kruskal's algorithms – Depth-first traversal – biconnectivity – Euler circuits – applications of graphs

UNIT V   ALGORITHM DESIGN AND ANALYSIS   9
Introduction to algorithm design techniques: Greedy algorithms, Divide and conquer, Dynamic programming, backtracking, branch and bound, Randomized algorithms – Introduction to algorithm analysis: asymptotic notations, recurrences – Introduction to NP-complete problems

TOTAL: 45PERIODS

TEXT BOOK:
1. M. A. Weiss, "Data Structures and Algorithm Analysis in C", Second Edition, Pearson Education, 1997.

REFERENCES:

1. A. V. Aho, J. E. Hopcroft, and J. D. Ullman, "Data Structures and Algorithms", Pearson Education, 198UNIT III
2. R. F. Gilberg, B. A. Forouzan, "Data Structures", Second Edition, Thomson India Edition, 2005.
3. A. M. Tenenbaum, Y. Langsam, and M. J. Augenstein, "Data Structures using C", Pearson Education, 1998.
4. K.S. Easwarakumar, Object Oriented Data Structures using C++, Vikas Publishing House pvt. Ltd., 2000
5. Sara Baase and A. Van Gelder, "Computer Algorithms", Third Edition, Pearson Education, 2000.
6. T. H. Cormen, C. E. Leiserson, R. L. Rivest, and C. Stein, "Introduction to algorithms", Second Edition, Prentice Hall of India Ltd, 2001.

IT 2202 **PRINCIPLES OF COMMUNICATION** **L T P C**
3 1 0 4

UNIT I FUNDAMENTALS OF ANALOG COMMUNICATION 9

Principles of amplitude modulation, AM envelope, frequency spectrum and bandwidth, modulation index and percent modulation, AM Voltage distribution, AM power distribution, Angle modulation - FM and PM waveforms, phase deviation and modulation index, frequency deviation and percent modulation, Frequency analysis of angle modulated waves. Bandwidth requirements for Angle modulated waves.

UNIT II DIGITAL COMMUNICATION 9

Introduction, Shannon limit for information capacity, digital amplitude modulation, frequency shift keying, FSK bit rate and baud, FSK transmitter, BW consideration of FSK, FSK receiver, phase shift keying – binary phase shift keying – QPSK, Quadrature Amplitude modulation, bandwidth efficiency, carrier recovery – squaring loop, Costas loop, DPSK.

UNIT III 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 IV 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, source coding of speech for wireless communications.

Satellite Communication Systems-Keplers Law,LEO and GEO Orbits, footprint, Link model-Optical Communication Systems-Elements of Optical Fiber Transmission link, Types, Losses, Sources and Detectors.

TUTORIAL: 15 TOTAL: 45 +15=60 PERIODS

TEXT BOOKS:

1. Wayne Tomasi, "Advanced Electronic Communication Systems", 6/e, Pearson Education, 2007.
2. Simon Haykin, "Communication Systems", 4th Edition, John Wiley & Sons., 2001.

REFERENCES:

1. H.Taub,D L Schilling ,G Saha ,"Principles of Communication"3/e,2007.
2. B.P.Lathi,"Modern Analog And Digital Communication systems", 3/e, Oxford University Press, 2007
3. Blake, "Electronic Communication Systems", Thomson Delmar Publications, 2002.
4. Martin S.Roden, "Analog and Digital Communication System", 3rd Edition, PHI, 2002.
5. B.Sklar,"Digital Communication Fundamentals and Applications"2/e Pearson Education 2007.

GE 2021   ENVIRONMENTAL SCIENCE AND ENGINEERING   L T P C
                                                                      3 0 0 3

AIM:

• The aim of this course is to create awareness in every engineering graduate about the importance of environment, the effect of technology on the environment and ecological balance and make them sensitive to the environment problems in every professional Endeavour that they participates.

OBJECTIVE:

• At the end of this course the student is expected to understand what constitutes the environment, what are precious resources in the environment, how to conserve these resources, what is the role of a human being in maintaining a clean environment and useful environment for the future generations and how to maintain ecological balance and preserve bio-diversity. The role of government and non-government organization in environment managements.

UNIT I   ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY   14

Definition, scope and importance of environment – need for public awareness - concept of an ecosystem – structure and function of an ecosystem – producers, consumers and decomposers – energy flow in the ecosystem – ecological succession – food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the (a) forest ecosystem (b) grassland ecosystem (c) desert ecosystem (d) aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) – Introduction to biodiversity definition: genetic, species and ecosystem diversity –

biogeographical classification of India – value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values – Biodiversity at global, national and local levels – India as a mega-diversity nation – hot-spots 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.

Field study of common plants, insects, birds
Field study of simple ecosystems – pond, river, hill slopes, etc.

UNIT II   ENVIRONMENTAL POLLUTION   8
Definition – causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards – solid waste management: causes, effects and control measures of municipal solid wastes – role of an individual in prevention of pollution – pollution case studies – disaster management: floods, earthquake, cyclone and landslides.
Field study of local polluted site – Urban / Rural / Industrial / Agricultural.

UNIT III   NATURAL RESOURCES   10
Forest resources: Use and over-exploitation, deforestation, case studies- timber extraction, mining, dams and their effects on forests and tribal people – Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies – Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. case studies – Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification – role of an individual in conservation of natural resources – Equitable use of resources for sustainable lifestyles.
Field study of local area to document environmental assets – river / forest / grassland / hill / mountain.

UNIT IV   SOCIAL ISSUES AND THE ENVIRONMENT   7
From unsustainable to sustainable development – urban problems related to energy – water conservation, rain water harvesting, watershed management – resettlement and rehabilitation of people; its problems and concerns, case studies – role of non-governmental organization- environmental ethics: Issues and possible solutions – climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies. – wasteland reclamation – consumerism and waste products – environment protection act – Air (Prevention and Control of Pollution) act – Water (Prevention and control of Pollution) act – Wildlife protection act – Forest conservation act – enforcement machinery involved in environmental legislation- central and state pollution control boards- Public awareness.

UNIT V   HUMAN POPULATION AND THE ENVIRONMENT   6
Population growth, variation among nations – population explosion – family welfare programme – environment and human health – human rights – value education – HIV / AIDS – women and child welfare – role of information technology in environment and human health – Case studies.

TOTAL: 45 PERIODS

TEXT BOOKS:
1. Gilbert M.Masters, 'Introduction to Environmental Engineering and Science', 2nd edition, Pearson Education (2004).
2. Benny Joseph, 'Environmental Science and Engineering', Tata McGraw-Hill,NewDelhi, (2006).

REFERENCES BOOKS:
1. R.K. Trivedi, 'Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards', Vol. I and II, Enviro Media.
2. Cunningham, W.P. Cooper, T.H. Gorhani, 'Environmental Encyclopedia', Jaico Publ., House, Mumbai, 2001.
3. Dharmendra S. Sengar, 'Environmental law', Prentice hall of India PVT LTD, New Delhi, 2007.
4. Rajagopalan, R, 'Environmental Studies-From Crisis to Cure', Oxford University Press (2005)

CS 2207	DIGITAL LABORATORY	L T P C
	(Common to CSE & IT)	0 0 3 2

LIST OF EXPERIMENTS

1. Verification of Boolean theorems using digital logic gates
2. Design and implementation of combinational circuits using basic gates for arbitrary functions, code converters, etc.
3. Design and implementation of 4-bit binary adder / subtractor using basic gates and MSI devices
4. Design and implementation of parity generator / checker using basic gates and MSI devices
5. Design and implementation of magnitude comparator
6. Design and implementation of application using multiplexers/Demultiplexers
7. Design and implementation of Shift registers
8. Design and implementation of Synchronous and Asynchronous counters
9. Simulation of combinational circuits using Hardware Description Language (VHDL/ Verilog HDL software required)
10. Simulation of sequential circuits using HDL (VHDL/ Verilog HDL software required)

List of equipments and components for a batch of 30 students (2 per batch)

S.NO	Name of equipment/ component	Quantity Reqd	Remarks
1	Dual power supply/ single mode powersupply	15/30	+12/-12V
2	IC Trainer	15	10 bit
3	Bread Boards	15	
4	Multimeter	5	
6	IC 7400	60	
7	IC7402	60	
8	IC 7404	60	

9	IC 7486	60	
10	IC 7408	60	
11	IC 7432	60	
12	IC 7483	60	
13	IC74150	60	
14	IC74151	40	
15	IC74147	40	
16	IC7445	40	
17	IC7476	40	
18	IC7491	40	
19	IC555	40	
20	IC7494	40	
21	IC7447	40	
22	IC74180	40	
23	IC7485	40	
24	IC7473	40	
25	IC74138	40	
26	IC7411	40	
27	IC7474	40	
28	Computer with HDL software	30	
29	Seven segment display	40	
30	Assembled LED board/LEDs	40/200	
31	Wires		Single strand

IT 2205   **DATA STRUCTURES AND ALGORITHMS LAB**   **L T P C**
                                                                                    0 0 3 2

AIM

To develop programming skills in design and implementation of data structures and their applications.

1. Implement singly and doubly linked lists.
2. Represent a polynomial as a linked list and write functions for polynomial addition.
3. Implement stack and use it to convert infix to postfix expression
4. Implement array-based circular queue and use it to simulate a producer-consumer problem.
5. Implement an expression tree. Produce its pre-order, in-order, and post-order traversals.
6. Implement binary search tree.

7. Implement priority queue using heaps
8. Implement hashing techniques.
9. Implement Dijkstra's algorithm using priority queues
10. Implement a backtracking algorithm for Knapsack problem

TOTAL: 45PERIODS

List of Equipments and components for A Batch of 30 students (1 per batch)

1. SOFTWARE REQUIRED   – **TURBOC version 3 or GCC version UNIT IIIUNIT III4**.
2. OPERATING SYSTEM   – **WINDOWS 2000 / XP / NT OR LINUX**
3. COMPUTERS REQUIRED   – **30 Nos**. (Minimum Requirement : Pentium III or Pentium IV with 256 RAM and 40 GB harddisk)

CS 2209	OBJECT-ORIENTED PROGRAMMING LAB	L T P C
	(Common to CSE & IT)	0 0 3 2

1. Design C++ classes with static members, methods with default arguments, friend functions. (For example, design matrix and vector classes with static allocation, and a friend function to do matrix-vector multiplication)
2. Implement complex number class with necessary operator overloadings and type conversions such as integer to complex, double to complex, complex to double etc.
3. Implement Matrix class with dynamic memory allocation and necessary methods. Give proper constructor, destructor, copy constructor, and overloading of assignment operator.
4. Overload the new and delete operators to provide custom dynamic allocation of memory.
5. Develop a template of linked-list class and its methods.
6. Develop templates of standard sorting algorithms such as bubble sort, insertion sort, merge sort, and quick sort.
7. Design stack and queue classes with necessary exception handling.
8. Define Point class and an Arc class. Define a Graph class which represents graph as a collection of Point objects and Arc objects. Write a method to find a minimum cost spanning tree in a graph.
9. Develop with suitable hierarchy, classes for Point, Shape, Rectangle, Square, Circle, Ellipse, Triangle, Polygon, etc. Design a simple test application to demonstrate dynamic polymorphism and RTTI.
10. Write a C++ program that randomly generates complex numbers (use previously designed Complex class) and writes them two per line in a file along with an operator (+, -, *, or /). The numbers are written to file in the format (a + ib). Write another program to read one line at a time from this file, perform the corresponding operation on the two complex numbers read, and write the result to another file (one per line).

List of Equipments and software for a batch of 30 students

1. PC – 30 nos.

    - Processor – 2.0 GHz or higher

    - RAM – 256 MB or higher

    - Hard disk – 20 GB or higher

    - OS- Windows 2000/ Windows XP/ NT

2. Software – Turbo C (freeware) – to be installed in all PC's.

MA2262   **PROBABILITY AND QUEUEING THEORY**   **L T P C**
                              (Common to CSE & IT)   **3 1 0 4**
AIM

The probabilistic models are employed in countless applications in all areas of science and engineering. Queuing theory provides models for a number of situations that arise in real life. The course aims at providing necessary mathematical support and confidence to tackle real life problems.

OBJECTIVES

At the end of the course, the students would

- Have a well – founded knowledge of standard distributions which can describe real life phenomena.
- Acquire skills in handling situations involving more than one random variable and functions of random variables.
- Understand and characterize phenomena which evolve with respect to time in a probabilistic manner.
- Be exposed to basic characteristic features of a queuing system and acquire skills in analyzing queuing models.

UNIT I   RANDOM VARIABLES   9+3
Discrete and continuous random variables - Moments - Moment generating functions and their properties. Binomial, Poisson ,Geometric ,Negative binomial, Uniform, Exponential, Gamma, and Weibull distributions .

UNIT II   TWO DIMENSIONAL RANDOM VARIABLES   9+3
Joint distributions - Marginal and conditional distributions – Covariance - Correlation and regression - Transformation of random variables - Central limit theorem.

UNIT III   MARKOV PROCESSES AND MARKOV CHAINS   9+3
Classification - Stationary process - Markov process - Markov chains - Transition probabilities - Limiting distributions-Poisson process

UNIT IV   QUEUEING THEORY   9+3

Markovian models – Birth and Death Queuing models- Steady state results: Single and multiple server queuing models- queues with finite waiting rooms- Finite source models- Little's Formula

UNIT V   NON-MARKOVIAN QUEUES AND QUEUE NETWORKS   9+3

M/G/1 queue- Pollaczek- Khintchine formula, series queues- open and closed networks

TUTORIAL   15 TOTAL : 60 PERIODS

TEXT BOOKS:

1. O.C. Ibe, "Fundamentals of Applied Probability and Random Processes", Elsevier, 1st Indian Reprint, 2007 (For units 1, 2 and 3).
2. D. Gross and C.M. Harris, "Fundamentals of Queueing Theory", Wiley Student edition, 2004 (For units 4 and 5).

REFERENCES:

1. A.O. Allen, "Probability, Statistics and Queueing Theory with Computer Applications", Elsevier, 2nd edition, 2005.
2. H.A. Taha, "Operations Research", Pearson Education, Asia, 8th edition, 2007.
3. K.S. Trivedi, "Probability and Statistics with Reliability, Queueing and Computer Science Applications", John Wiley and Sons, 2nd edition, 2002.

CS 2255   **DATABASE MANAGEMENT SYSTEMS**   **L T P C**
                          (Common to CSE & IT)   **3 0 0 3**

UNIT I   INTRODUCTION   9

Purpose of Database System -– Views of data – Data Models – Database Languages –– Database System Architecture – Database users and Administrator – Entity–Relationship model (E-R model) – E-R Diagrams -- Introduction to relational databases

UNIT II   RELATIONAL MODEL   9

The relational Model – The catalog- Types– Keys - Relational Algebra – Domain Relational Calculus – Tuple Relational Calculus - Fundamental operations – Additional Operations- SQL fundamentals - Integrity – Triggers - Security – Advanced SQL features –Embedded SQL– Dynamic SQL- Missing Information– Views – Introduction to Distributed Databases and Client/Server Databases

UNIT III   DATABASE DESIGN   9

Functional Dependencies – Non-loss Decomposition – Functional Dependencies – First, Second, Third Normal Forms, Dependency Preservation – Boyce/Codd Normal Form- Multi-valued Dependencies and Fourth Normal Form – Join Dependencies and Fifth Normal Form

UNIT IV   TRANSACTIONS   9

Transaction Concepts - Transaction Recovery – ACID Properties – System Recovery – Media Recovery – Two Phase Commit - Save Points – SQL Facilities for recovery – Concurrency – Need for Concurrency – Locking Protocols – Two Phase Locking – Intent Locking – Deadlock- Serializability – Recovery Isolation Levels – SQL Facilities for Concurrency**.**

UNIT V   IMPLEMENTATION TECHNIQUES   9

Overview of Physical Storage Media – Magnetic Disks – RAID – Tertiary storage – File Organization – Organization of Records in Files – Indexing and Hashing –Ordered Indices – B+ tree Index Files – B tree Index Files – Static Hashing – Dynamic Hashing – Query Processing Overview – Catalog Information for Cost Estimation – Selection Operation – Sorting – Join Operation – Database Tuning.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, "Database System Concepts", Fifth Edition, Tata McGraw Hill, 2006 (Unit I and Unit-V) .

2. C.J.Date, A.Kannan, S.Swamynathan, "An Introduction to Database Systems", Eighth Edition, Pearson Education, 2006.(Unit II, III and IV)

REFERENCES:

1. Ramez Elmasri, Shamkant B. Navathe, "Fundamentals of Database Systems", FourthEdition , Pearson / Addision wesley, 2007.
2. Raghu Ramakrishnan, "Database Management Systems", Third Edition, McGraw Hill, 200UNIT III
3. S.K.Singh, "Database Systems Concepts, Design and Applications", First Edition, Pearson Education,   2006.

CS 2252   MICROPROCESSORS AND MICROCONTROLLERS   L T P C
                              (Common to CSE & IT)   **3 0 0 3**

UNIT I   THE 8085 AND 8086 MICROPROCESSORS   9
8085 Microprocessor architecture-Addressing modes- Instruction set-Programming the 8085

UNIT II   SOFTWARE ASPECTS   9
Intel 8086 microprocessor - Architecture - Signals- Instruction Set-Addressing Modes-Assembler Directives- Assembly Language Programming-Procedures-Macros-Interrupts And Interrupt Service Routines-BIOS function calls.

UNIT III   MULTIPROCESSOR CONFIGURATIONS   9
Coprocessor Configuration – Closely Coupled Configuration – Loosely Coupled Configuration –8087 Numeric Data Processor – Data Types – Architecture –8089 I/O Processor –Architecture –Communication between CPU and IOP.

UNIT IV   I/O INTERFACING   9

Memory interfacing and I/O interfacing with 8085 – parallel communication interface – serial communication interface – timer-keyboard/display controller – interrupt controller – DMA controller (8237) – applications – stepper motor – temperature control.

UNIT V   MICROCONTROLLERS   9

Architecture of 8051 Microcontroller – signals – I/O ports – memory – counters and timers – serial data I/O – interrupts- Interfacing -keyboard, LCD,ADC & DAC

TOTAL: 45 PERIODS

TEXT BOOKS:
1. Ramesh S. Gaonkar ,"Microprocessor – Architecture, Programming and Applications with the 8085" Penram International Publisher , 5th Ed.,2006
2. Yn-cheng Liu,Glenn A.Gibson, "Microcomputer systems: The 8086 / 8088 Family architecture, Programming and Design", second edition, Prentice Hall of India , 2006
3. Kenneth J.Ayala, 'The 8051 microcontroller Architecture, Programming and applications' second edition ,Penram international.

REFERENCES:
1. Douglas V.Hall, " Microprocessors and Interfacing : Programming and Hardware", second edition , Tata Mc Graw Hill ,2006.
2. A.K.Ray & K.M Bhurchandi, "Advanced Microprocessor and Peripherals – Architecture, Programming and Interfacing", Tata Mc Graw Hill , 2006.
3. Peter Abel, " IBM PC Assembly language and programming" , fifth edition, Pearson education / Prentice Hall of India Pvt.Ltd,2007.
4. Mohamed Ali Mazidi,Janice Gillispie Mazidi," The 8051 microcontroller and embedded systems using Assembly and C",second edition, Pearson education /Prentice hall of India , 2007.

CS 2253   COMPUTER ORGANIZATION AND ARCHITECTURE   L T P C
                    (Common to CSE & IT)   **3 0 0 3**

UNIT I   BASIC STRUCTURE OF COMPUTERS   9

Functional units – Basic operational concepts – Bus structures – Performance and metrics – Instructions and instruction sequencing – Hardware – Software Interface – Instruction set architecture – Addressing modes – RISC – CISC. ALU design – Fixed point and floating point operations.

UNIT II   BASIC PROCESSING UNIT   9

Fundamental concepts – Execution of a complete instruction – Multiple bus organization – Hardwired control – Micro programmed control – Nano programming.

UNIT III   PIPELINING   9

Basic concepts – Data hazards – Instruction hazards – Influence on instruction sets – Data path and control considerations – Performance considerations – Exception handling.

UNIT IV   MEMORY SYSTEM   9
Basic concepts – Semiconductor RAM – ROM – Speed – Size and cost – Cache memories – Improving cache performance – Virtual memory – Memory management requirements – Associative memories – Secondary storage devices.

UNIT V   I/O ORGANIZATION   9
Accessing I/O devices – Programmed Input/Output -Interrupts – Direct Memory Access – Buses – Interface circuits – Standard I/O Interfaces (PCI, SCSI, USB), I/O devices and processors.

TOTAL:45 PERIODS

TEXT BOOK:
1. Carl Hamacher, Zvonko Vranesic and Safwat Zaky, "Computer Organization", Fifth Edition, Tata McGraw Hill, 2002.

REFERENCES:
1. David A. Patterson and John L. Hennessy, "Computer Organization and Design: The Hardware/Software interface", Third Edition, Elsevier, 2005.
2. William Stallings, "Computer Organization and Architecture – Designing for Performance", Sixth Edition, Pearson Education, 200UNIT III
3. John P. Hayes, "Computer Architecture and Organization", Third Edition, Tata McGraw Hill, 1998.
4. V.P. Heuring, H.F. Jordan, "Computer Systems Design and Architecture", Second Edition, Pearson Education, 2004.

CS 2254   OPERATING SYSTEMS   L T P C
                         (Common to CSE & IT)   **3 0 0 3**

AIM
To learn the various aspects of operating systems such as process management, memory management, and I/O management

UNIT I   PROCESSES AND THREADS   9
Introduction to operating systems – review of computer organization – operating system structures – system calls – system programs – system structure – virtual machines. Processes: Process concept – Process scheduling – Operations on processes – Cooperating processes – Interprocess communication – Communication in client-server systems. Case study: IPC in Linux. Threads: Multi-threading models – Threading issues. Case Study: Pthreads library

UNIT II   PROCESS SCHEDULING AND SYNCHRONIZATION   10
CPU Scheduling: Scheduling criteria – Scheduling algorithms – Multiple-processor scheduling – Real time scheduling – Algorithm Evaluation. Case study: Process scheduling in Linux. Process Synchronization: The critical-section problem – Synchronization hardware – Semaphores – Classic problems of synchronization – critical regions – Monitors. Deadlock: System model – Deadlock characterization – Methods for handling deadlocks – Deadlock prevention – Deadlock avoidance – Deadlock detection – Recovery from deadlock.

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UNIT III   STORAGE MANAGEMENT   9
Memory Management: Background – Swapping – Contiguous memory allocation
– Paging – Segmentation – Segmentation with paging. Virtual Memory: Background –
Demand paging – Process creation – Page replacement – Allocation of frames –
Thrashing. Case Study: Memory management in Linux

UNIT IV   FILE SYSTEMS   9
File-System Interface: File concept – Access methods – Directory structure – File-
system mounting – Protection. File-System Implementation : Directory implementation –
Allocation methods – Free-space management – efficiency and performance – recovery
– log-structured file systems. Case studies: File system in Linux – file system in
Windows XP

UNIT V   I/O SYSTEMS   8
I/O Systems – I/O Hardware – Application I/O interface – kernel I/O subsystem –
streams – performance. Mass-Storage Structure: Disk scheduling – Disk management –
Swap-space management – RAID – disk attachment – stable storage – tertiary storage.
Case study: I/O in Linux
                                                        TOTAL: 45 PERIODS
TEXT BOOK:
1. Silberschatz, Galvin, and Gagne, "Operating System Concepts", Sixth Edition,
    Wiley India Pvt Ltd, 200UNIT III

REFERENCES:
1. Andrew S. Tanenbaum, "Modern Operating Systems", Second Edition, Pearson
    Education / PHI 2001.
2. Gary Nutt, "Operating Systems", Third Edition, Pearson Education, 2004.
3. Harvey M. Deital, "Operating Systems", Third Edition, Pearson Education, 2004.

IT 2251   SOFTWARE ENGINEERING AND QUALITY ASSURANCE   L T P C
                                                          3 0 0 3

UNIT I   SOFTWARE PRODUCT AND PROCESS   9
Introduction – S/W Engineering Paradigm – Verification – Validation – Life Cycle Models
– System Engineering – Computer Based System – Business Process Engineering
Overview – Product Engineering Overview.

UNIT II   SOFTWARE REQUIREMENTS   9
Functional and Non-Functional – Software Document – Requirement Engineering
Process – Feasibility Studies – Software Prototyping – Prototyping in the Software
Process – Data – Functional and Behavioral Models – Structured Analysis and Data
Dictionary.

UNIT III   ANALYSIS, DESIGN CONCEPTS AND PRINCIPLES   9

Systems Engineering - Analysis Concepts - Design Process And Concepts – Modular Design – Design Heuristic – Architectural Design – Data Design – User Interface Design – Real Time Software Design – System Design – Real Time Executives – Data Acquisition System – Monitoring And Control System.

UNIT IV   TESTING   9
Taxonomy Of Software Testing – Types Of S/W Test – Black Box Testing – Testing Boundary Conditions – Structural Testing – Test Coverage Criteria Based On Data Flow Mechanisms – Regression Testing – Unit Testing – Integration Testing – Validation Testing – System Testing And Debugging – Software Implementation Techniques

UNIT V   SOFTWARE QUALITY ASSURANCE   9
Process and Product Quality – Quality Assurance and Standards – Quality Planning and Control – Software metrics – Process Improvement – Software configuration Management.

                                                            TOTAL = 45 PERIODS

TEXT BOOKS:
1. Ian Sommerville, "Software engineering", Seventh Edition, Pearson Education Asia, 2007.
2. Roger S. Pressman, "Software Engineering – A practitioner's Approach", Sixth Edition, McGraw-Hill International Edition, 2005.

REFERENCES:
1. Watts S.Humphrey,"A Discipline for Software Engineering", Pearson Education, 2007.
2. James F.Peters and Witold Pedrycz,"Software Engineering, An Engineering Approach", Wiley-India, 2007.
3. Stephen R.Schach, " Software Engineering", Tata McGraw-Hill Publishing Company Limited, 2007.
4. S.A.Kelkar,"Software Engineering", Prentice Hall of India Pvt, 2007.

CS 2258   DATA BASE MANAGEMENT SYSTEM LAB   L T P C
                   (Common to CSE & IT)   0 0 3 2
1. Data Definition, Table Creation, Constraints,

2. Insert, Select Commands, Update & Delete Commands.

3. Nested Queries & Join Queries

4. Views

5. High level programming language extensions (Control structures, Procedures and Functions).

6. Front end tools

7. Forms

8. Triggers

9. Menu Design

10. Reports.

11. Database Design and implementation (Mini Project).

LAB EQUIPMENTS

(Common to Information Technology & Computer Science Engineering)

Hardware and Software required for a batch of 30 students:

Hardware:
30 Personal Computers

Software:
Front end : VB/VC ++/JAVA

Back end: Oracle 11g, my SQL, DB2

Platform: Windows 2000 Professional/XP

Oracle server could be loaded and can be connected from individual PCs.

CS 2257	OPERATING SYSTEMS LAB	L T P C
	(Common to CSE & IT)	0 0 3 2

(Implement the following on LINUX or other Unix like platform. Use C for high level language implementation)

1.   Write programs using the following system calls of UNIX operating system:
       fork, exec, getpid, exit, wait, close, stat, opendir, readdir

2.   Write programs using the I/O system calls of UNIX operating system (open, read, write, etc)

3.   Write C programs to simulate UNIX commands like ls, grep, etc.

4.   Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for FCFS and SJF. For each of the scheduling policies, compute and print the average waiting time and average turnaround time. (2 sessions)

5.   Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for Priority and Round robin. For each of the scheduling policies, compute and print the average waiting time and average turnaround time. (2 sessions)

6.   Developing Application using Inter Process communication (using shared memory, pipes or message queues)

7.   Implement the Producer – Consumer problem using semaphores (using UNIX system calls).

8.   Implement some memory management schemes – I

9.   Implement some memory management schemes – II

10.   Implement any file allocation technique (Linked, Indexed or Contiguous)

Example for exercises 8 & 9 :
Free space is maintained as a linked list of nodes with each node having the starting byte address and the ending byte address of a free block. Each memory request consists of the process-id and the amount of storage space required in bytes. Allocated memory space is again maintained as a linked list of nodes with each node having the process-id, starting byte address and the ending byte address of the allocated space. When a process finishes (taken as input) the appropriate node from the allocated list should be deleted and
this free disk space should be added to the free space list. [Care should be taken to merge contiguous free blocks into one single block. This results in deleting more than one node from the free space list and changing the start and end address in the appropriate node]. For allocation use first fit, worst fit and best fit.

TOTAL: 45PERIODS

Hardware and Software required for a batch of 30 students.

HARDWARE:
   30 Personal Computers

SOFTWARE:
Linux:
   • Ubuntu / OpenSUSE / Fedora / Red Hat / Debian / Mint OS
     Linux could be loaded in individual PCs.

(OR)
   A single server could be loaded with Linux and connected from the individual PCs.

CS2259	**MICROPROCESSORS LABORATORY**	**L T P C**
	(Common to CSE & IT)	**0 0 3 2**

AIM:
   • To learn the assembly language programming of 8085,8086 and 8051 and also to give a practical training of interfacing the peripheral devices with the processor.

OBJECTIVES:
   • To implement the assembly language programming of 8085,8086 and 8051.
   • To study the system function calls like BIOS/DOS.
   • To experiment the interface concepts of various peripheral device with the processor.

EXPERIMENTS IN THE FOLLOWING
1. Programming with 8085
2. Programming with 8086-experiments including BIOS/DOS calls:
   Keyboard control, Display, File Manipulation.
3. Interfacing with 8085/8086-8255,8253
4. Interfacing with 8085/8086-8279,8251
5. 8051 Microcontroller based experiments for Control Applications
6. Mini- Project

TOTAL: 45 PERIODS

List of equipments/components for 30 students (two per batch)
1. 8085 Trainer Kit with onboard 8255, 8253, 8279 and 8251 – 15 nos.

2. TASM/MASM simulator in PC (8086 programs) – 30 nos.

3. 8051 trainer kit – 15 nos.

4. Interfacing with 8086 – PC add-on cards with 8255, 8253, 8279 and 8251 – 15 nos.

5. Stepper motor interfacing module – 5 nos.

6. Traffic light controller interfacing module – 5 nos.

7. ADC, DAC interfacing module – 5 nos.

8. CRO's – 5 nos.

MG2452   ENGINEERING ECONOMICS AND FINANCIAL ACCOUNTING   L T P C
3 0 0 3

UNIT I   INTRODUCTION   5
Managerial Economics - Relationship with other disciplines - Firms: Types, objectives and goals - Managerial decisions - Decision analysis.

UNIT II   DEMAND & 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 - Least cost input - Isoquants - Managerial uses of production function.

Cost Concepts - Cost function - Determinants of cost - Short run and Long run cost curves - Cost Output Decision - Estimation of Cost.

UNIT IV   PRICING   5
Determinants of Price - Pricing under different objectives and different market structures - Price discrimination - Pricing methods in practice.

UNIT V   FINANCIAL ACCOUNTING (ELEMENTARY TREATMENT)   10

Balance sheet and related concepts - Profit & Loss Statement and related concepts - -
Financial Ratio Analysis - Cash flow analysis - Funds flow analysis - Comparative
financial statements - Analysis & Interpretation of financial statements.

UNIT VI   CAPITAL BUDGETING. (ELEMENTARY TREATMENT)   5

Investments - Risks and return evaluation of investment decision - Average rate of return
- Payback Period - Net Present Value - Internal rate of return.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Samuelson. Paul A and Nordhaus W.D., 'Economics', Tata Mcgraw Hill Publishing
    Company Limited, New Delhi, 2004.
2. McGuigan, Moyer and Harris, 'Managerial Economics; Applications, Strategy and
    Tactics', Thomson South Western, 10th Edition, 2005.
3. Paresh Shah, 'Basic Financial Accounting for Management', Oxford University Press,
    New Delhi, 2007.
4. Salvatore Dominick, 'Managerial Economics in a global economy'. Thomson South
    Western, 4th Edition, 2001.
5. Prasanna Chandra. 'Fundamentals of Financial Management', Tata Mcgraw Hill
    Publishing Ltd., 4th edition, 2005.

IT2301   JAVA PROGRAMMING   L T P C
                                                                      3 0 0 3

AIM

To understand the concepts of object-oriented, event driven, and concurrent
programming paradigms and develop skills in using these paradigms using Java.

UNIT I   9

Object oriented programming concepts – objects – classes – methods and messages –
abstraction and encapsulation – inheritance – abstract classes – polymorphism.- Objects
and classes in Java – defining classes – methods - access specifiers – static members –
constructors – finalize method

UNIT II   10

Arrays – Strings - Packages – Java-Doc comments –- Inheritance – class hierarchy –
polymorphism – dynamic binding – final keyword – abstract classes

UNIT III   10

The Object class – Reflection – interfaces – object cloning – inner classes – proxies - I/O
Streams - Graphics programming – Frame – Components – working with 2D shapes.

UNIT IV   8

Basics of event handling – event handlers – adapter classes – actions – mouse events –
AWT event hierarchy – introduction to Swing – Model-View-Controller design pattern –
buttons – layout management – Swing Components – exception handling – exception
hierarchy – throwing and catching exceptions.

UNIT V **8**

Motivation for generic programming – generic classes – generic methods – generic code and virtual machine – inheritance and generics – reflection and generics - Multi-threaded programming – interrupting threads – thread states – thread properties – thread synchronization – Executors – synchronizers.

TOTAL:45 PERIODS

TEXT BOOK

1. Cay S. Horstmann and Gary Cornell, "Core Java: Volume I – Fundamentals", Eighth Edition, Sun Microsystems Press, 2008.

REFERENCES

1. K. Arnold and J. Gosling, "The JAVA programming language", Third edition, Pearson Education, 2000.
2. Timothy Budd, "Understanding Object-oriented programming with Java", Updated Edition, Pearson Education, 2000.
3. C. Thomas Wu, "An introduction to Object-oriented programming with Java", Fourth Edition, Tata McGraw-Hill Publishing company Ltd., 2006.

CS2304   **SYSTEM SOFTWARE**   **L T P C**
                                                                         3 1 0 4

AIM

 To have an understanding of foundations of design of assemblers, loaders, linkers, and macro processors.

OBJECTIVES

- To understand the relationship between system software and machine architecture.
- To know the design and implementation of assemblers
- To know the design and implementation of linkers and loaders.
- To have an understanding of macro processors.
- To have an understanding of system software tools.

UNIT I   INTRODUCTION   **8**

System software and machine architecture – The Simplified Instructional Computer (SIC) - Machine architecture - Data and instruction formats - addressing modes - instruction sets - I/O and programming.

UNIT II   ASSEMBLERS   **10**

Basic assembler functions **-** A simple SIC assembler – Assembler algorithm and data structures - Machine dependent assembler features **-** Instruction formats and addressing modes – Program relocation - Machine independent assembler features - Literals – Symbol-defining statements – Expressions - One pass assemblers and Multi pass assemblers - Implementation example - MASM assembler.

UNIT III   LOADERS AND LINKERS   9

Basic loader functions **-** Design of an Absolute Loader – A Simple Bootstrap Loader - Machine dependent loader features - Relocation – Program Linking – Algorithm and Data Structures for Linking Loader - Machine-independent loader features **-** Automatic Library Search – Loader Options - Loader design options - Linkage Editors – Dynamic Linking – Bootstrap Loaders - Implementation example - MSDOS linker.

UNIT IV   MACRO PROCESSORS   9

Basic macro processor functions - Macro Definition and Expansion – Macro Processor Algorithm and data structures - Machine-independent macro processor features - Concatenation of Macro Parameters – Generation of Unique Labels – Conditional Macro Expansion – Keyword Macro Parameters-Macro within Macro-Implementation example - MASM Macro Processor – ANSI C Macro language.

UNIT V   SYSTEM SOFTWARE TOOLS   9

Text editors - Overview of the Editing Process - User Interface – Editor Structure. - Interactive debugging systems **-** Debugging functions and capabilities – Relationship with other parts of the system – User-Interface Criteria.

L: 45, T: 15, TOTAL: 60 PERIODS

TEXT BOOK

1. Leland L. Beck, "System Software – An Introduction to Systems Programming", 3rd Edition, Pearson Education Asia, 2000.

REFERENCES

1. D. M. Dhamdhere, "Systems Programming and Operating Systems", Second Revised Edition, Tata McGraw-Hill, 1999.
2. John J. Donovan "Systems Programming", Tata McGraw-Hill Edition, 1972.
3. John R. Levine, Linkers & Loaders – Harcourt India Pvt. Ltd., Morgan Kaufmann Publishers, 2000.

CS2302   **COMPUTER NETWORKS**   **L T P C**
      3 0 0 3

UNIT I   9

Network architecture – layers – Physical links – Channel access on links – Hybrid multiple access techniques - Issues in the data link layer - Framing – Error correction and detection – Link-level Flow Control

UNIT II   9

Medium access – CSMA – Ethernet – Token ring – FDDI - Wireless LAN – Bridges and Switches

UNIT III   9

Circuit switching vs. packet switching / Packet switched networks – IP – ARP – RARP – DHCP – ICMP – Queueing discipline – Routing algorithms – RIP – OSPF – Subnetting – CIDR – Interdomain routing – BGP – Ipv6 – Multicasting – Congestion avoidance in network layer

UNIT IV **9**

UDP – TCP – Adaptive Flow Control – Adaptive Retransmission - Congestion control – Congestion avoidance – QoS

UNIT V **9**

Email (SMTP, MIME, IMAP, POP3) – HTTP – DNS- SNMP – Telnet – FTP – Security – PGP - SSH

TOTAL: 45 PERIODS

TEXT BOOK:
1. Larry L. Peterson, Bruce S. Davie, "Computer Networks: A Systems Approach", Third Edition, Morgan Kauffmann Publishers Inc., 200UNIT III

REFERENCES:
1. James F. Kuross, Keith W. Ross, "Computer Networking, A Top-Down Approach Featuring the Internet", Third Edition, Addison Wesley, 2004.
2. Nader F. Mir, "Computer and Communication Networks", Pearson Education, 2007
3. Comer, "Computer Networks and Internets with Internet Applications", Fourth Edition, Pearson Education, 200UNIT III
4. Andrew S. Tanenbaum, "Computer Networks", Fourth Edition, 200UNIT III
5. William Stallings, "Data and Computer Communication", Sixth Edition, Pearson Education, 2000

CS2403 **DIGITAL SIGNAL PROCESSING** **L T P C**
3 0 0 3

UNIT I **SIGNALS AND SYSTEMS** **9**

Basic elements of DSP – concepts of frequency in Analog and Digital Signals – sampling theorem – Discrete – time signals, systems – Analysis of discrete time LTI systems – Z transform – Convolution (linear and circular) – Correlation.

UNIT II **FREQUENCY TRANSFORMATIONS** **9**

Introduction to DFT – Properties of DFT – Filtering methods based on DFT – FFT Algorithms Decimation – in – time Algorithms, Decimation – in – frequency Algorithms – Use of FFT in Linear Filtering – DCT.

UNIT III **IIR FILTER DESIGN** **9**

Structures of IIR – Analog filter design – Discrete time IIR filter from analog filter – IIR filter design by Impulse Invariance, Bilinear transformation, Approximation of derivatives – (HPF, BPF, BRF) filter design using frequency translation

UNIT IV **FIR FILTER DESIGN** **9**

Structures of FIR – Linear phase FIR filter – Filter design using windowing techniques, Frequency sampling techniques – Finite word length effects in digital Filters

UNIT V **APPLICATIONS** **9**

Multirate signal processing – Speech compression – Adaptive filter – Musical sound processing – Image enhancement.

TOTAL:45 PERIODS

TEXT BOOKS:

1. John G. Proakis & Dimitris G.Manolakis, "Digital Signal Processing – Principles, Algorithms & Applications", Fourth edition, Pearson education / Prentice Hall, 2007.
2. Emmanuel C..Ifeachor, & Barrie.W.Jervis, "Digital Signal Processing", Second edition, Pearson Education / Prentice Hall, 2002.

REFERENCES:

1. Alan V.Oppenheim, Ronald W. Schafer & Hohn. R.Back, "Discrete Time Signal Processing", Pearson Education.
2. Andreas Antoniou, "Digital Signal Processing", Tata McGraw Hill.

IT2302   **INFORMATION THEORY AND CODING**   **L T P C**
                                                                         3 0 0 3

UNIT I   INFORMATION THEORY   9
Information – Entropy, Information rate, classification of codes, Kraft McMillan inequality, Source coding theorem, Shannon-Fano coding, Huffman coding, Extended Huffman coding - Joint and conditional entropies, Mutual information - Discrete memoryless channels – BSC, BEC – Channel capacity, Shannon limit.

UNIT II   SOURCE CODING: TEXT, AUDIO AND SPEECH   9
Text: Adaptive Huffman Coding, Arithmetic Coding, LZW algorithm – Audio: Perceptual coding, Masking techniques, Psychoacoustic model, MEG Audio layers I,II,III, Dolby AC3 - Speech: Channel Vocoder, Linear Predictive Coding

UNIT III   SOURCE CODING: IMAGE AND VIDEO   9
Image and Video Formats – GIF, TIFF, SIF, CIF, QCIF – Image compression: READ, JPEG – Video Compression: Principles-I,B,P frames, Motion estimation, Motion compensation, H.261, MPEG standard

UNIT IV   ERROR CONTROL CODING: BLOCK CODES   9
Definitions and Principles: Hamming weight, Hamming distance, Minimum distance decoding - Single parity codes, Hamming codes, Repetition codes - Linear block codes, Cyclic codes - Syndrome calculation, Encoder and decoder - CRC

UNIT V   ERROR CONTROL CODING: CONVOLUTIONAL CODES   9
Convolutional codes – code tree, trellis, state diagram - Encoding – Decoding: Sequential search and Viterbi algorithm – Principle of Turbo coding

                                                              TOTAL: 45 PERIODS
TEXT BOOKS:
1. R Bose, "Information Theory, Coding and Crptography", TMH 2007
2. Fred Halsall, "Multidedia Communications: Applications, Networks, Protocols and Standards", Perason Education Asia, 2002

REFERENCES
1. K Sayood, "Introduction to Data Compression" 3/e, Elsevier 2006
2. S Gravano, "Introduction to Error Control Codes", Oxford University Press 2007
3. Amitabha Bhattacharya, "Digital Communication", TMH 2006

CS2308   **SYSTEM SOFTWARE LAB**   **L T P C**
                                                                          0 0 3 2

(Using C)

1. Implement a symbol table with functions to create, insert, modify, search, and display.
2. Implement pass one of a two pass assembler.
3. Implement pass two of a two pass assembler.
4. Implement a single pass assembler.
5. Implement a two pass macro processor
6. Implement a single pass macro processor.
7. Implement an absolute loader.
8. Implement a relocating loader.
9. Implement pass one of a direct-linking loader.
10. Implement pass two of a direct-linking loader.
11. Implement a simple text editor with features like insertion / deletion of a character, word, and sentence.
12. Implement a symbol table with suitable hashing

(For loader exercises, output the snap shot of the main memory as it would be, after the loading has taken place)

TOTAL: 45 PERIODS

Requirement for a batch of 30 students

S.No.	Description of Equipment	Quantity Required	Quantity available	Deficiency %
1.	Hardware – Pentium PC Desktops	30 Nos.		
2.	Software – Turbo C (Freely download)	30 user License		

IT2305   **JAVA PROGRAMMING LAB**   **L T PC**
                                                                          0 0 3 2

1. Develop a Java package with simple Stack and Queue classes. Use JavaDoc comments for documentation.
2. Design a class for Complex numbers in Java. In addition to methods for basic operations on complex numbers, provide a method to return the number of active objects created.
3. Design a Date class similar to the one provided in the java.util package.
4. Develop with suitable hierarchy, classes for Point, Shape, Rectangle, Square, Circle, Ellipse, Triangle, Polygon, etc. Design a simple test application to demonstrate dynamic polymorphism.

5. Design a Java interface for ADT Stack. Develop two different classes that implement this interface, one using array and the other using linked-list. Provide necessary exception handling in both the implementations.
6. Write a Java program to read a file that contains DNA sequences of arbitrary length one per line (note that each DNA sequence is just a String). Your program should sort the sequences in descending order with respect to the number of 'TATA' subsequences present. Finally write the sequences in sorted order into another file.
7. Develop a simple paint-like program that can draw basic graphical primitives in different dimensions and colors. Use appropriate menu and buttons.
8. Develop a scientific calculator using even-driven programming paradigm of Java.
9. Develop a template for linked-list class along with its methods in Java.
10. Design a thread-safe implementation of Queue class. Write a multi-threaded producer-consumer application that uses this Queue class.
11. Write a multi-threaded Java program to print all numbers below 100,000 that are both prime and fibonacci number (some examples are 2, 3, 5, 13, etc.). Design a thread that generates prime numbers below 100,000 and writes them into a pipe. Design another thread that generates fibonacci numbers and writes them to another pipe. The main thread should read both the pipes to identify numbers common to both.
12. Develop a multi-threaded GUI application of your choice.

TOTAL:45 PERIODS
Requirement for a batch of 30 students

S. No.	Description of Equipment	Quantity Required	Quantity available	Deficiency %
3.	**Hardware:** Pentium IV with 2 GB RAM, 160 GB HARD Disk, Monitor 1024 x 768 colour 60 Hz.	30 Nodes		
4.	**Software:** Windows /Linux operating system JDK 1.6(or above)	30 user license		

GE2321   **COMMUNICATION SKILLS LABORATORY**
                    (Fifth / Sixth Semester)   **L T P C**
                                                                  0 0 4 2

Globalisation has brought in numerous opportunities for the teeming millions, with more focus on the students' overall capability apart from academic competence. Many students, particularly those from non-English medium schools, find that they are not preferred due to their inadequacy of communication skills and soft skills, despite possessing sound knowledge in their subject area along with technical capability. Keeping in view their pre-employment needs and career requirements, this course on Communication Skills Laboratory will prepare students to adapt themselves with ease to the industry environment, thus rendering them as prospective assets to industries. The course will equip the students with the necessary communication skills that would go a long way in helping them in their profession.

OBJECTIVES:

- To equip students of engineering and technology with effective speaking and
- listening skills in English.
- To help them develop their soft skills and interpersonal skills, which will make the transition from college to workplace smoother and help them excel in their job.
- To enhance the performance of students at Placement Interviews, Group Discussions and other recruitment exercises.

I. PC based session	(Weightage 40%)	24 periods

A. ENGLISH LANGUAGE LAB (18 Periods)

UNIT I   LISTENING COMPREHENSION: (6)
Listening and typing – Listening and sequencing of sentences – Filling in the blanks - Listening and answering questions.

UNIT II   READING COMPREHENSION: (6)
Filling in the blanks - Close exercises – Vocabulary building - Reading and answering questions.

UNIT III   SPEAKING: (6)
Phonetics: Intonation – Ear training - Correct Pronunciation – Sound recognition exercises – Common Errors in English.

Conversations: Face to Face Conversation – Telephone conversation – Role play activities (Students take on roles and engage in conversation)

B.   DISCUSSION OF AUDIO-VISUAL MATERIALS   (6 PERIODS)
        (Samples are available to learn and practice)

UNIT I   RESUME / REPORT PREPARATION / LETTER WRITING   (1)
Structuring the resume / report - Letter writing / Email Communication - Samples.

UNIT II   PRESENTATION SKILLS: (1)
Elements of effective presentation – Structure of presentation - Presentation tools – Voice Modulation – Audience analysis - Body language – Video samples

UNIT III   SOFT SKILLS: (2)
Time management – Articulateness – Assertiveness – Psychometrics –
Innovation and Creativity - Stress Management & Poise - Video Samples

UNIT IV   GROUP DISCUSSION: (1)
Why is GD part of selection process ? - Structure of GD – Moderator – led and other GDs - Strategies in GD – Team work - Body Language - Mock GD -Video samples

UNIT V   INTERVIEW SKILLS: (1)
Kinds of interviews – Required Key Skills – Corporate culture – Mock interviews-Video samples.

II. Practice Session	(Weightage – 60%)	24 periods

1. **Resume / Report Preparation / Letter writing**: Students prepare their   (2)
    own resume and report.

2. **Presentation Skills:** Students make presentations on given topics.   (8)

3. **Group Discussion**: Students participate in group discussions.   (6)

4. **Interview Skills**: Students participate in Mock Interviews   (8)

REFERENCES:

1. Anderson, P.V, **Technical Communication**, Thomson Wadsworth, Sixth Edition, New Delhi, 2007.

2. Prakash, P, **Verbal and Non-Verbal Reasoning**, Macmillan India Ltd., Second Edition, New Delhi, 2004.

3. John Seely, **The Oxford Guide to Writing and Speaking**, Oxford University Press, New Delhi, 2004.

4. Evans, D, **Decision maker**, Cambridge University Press, 1997.

5. Thorpe, E, and Thorpe, S, **Objective English**, Pearson Education, Second Edition, New Delhi, 2007.

6. Turton, N.D and Heaton, J.B, **Dictionary of Common Errors**, Addison Wesley Longman Ltd., Indian reprint 1998.

LAB REQUIREMENTS:
1.   Teacher console and systems for students.
2.   English Language Lab Software
3.   Career Lab Software

Requirement for a batch of 60 students

Sl.No.	Description of Equipment	Quantity required	Quantity available	Deficiency %
1.	**Server** o PIV system o 1 GB RAM / 40 GB HDD o OS: Win 2000 server o Audio card with headphones (with mike) o JRE 1.3	1 No.		
2.	Client Systems	60 No.		

	o **PIII or above**			
	o **256 or 512 MB RAM /40 GB HDD**			
	o **OS: Win 2000**			
	o Audio card with headphones (with mike)			
	o JRE 1.3			
UNIT III	**Softwares**			
	a) Interactive Teacher Control Software	Available / Not Available		
	b) English Language Lab Software	Available / Not Available		
	c) Career Lab software	Available / Not Available		
4.	**Handicam Video Camera (with video lights and mic input)**	1 No.		
5.	Television - 29"	1 No.		
6.	Collar mike	1 No.		
7.	Cordless mikes	1 No.		
8.	Audio Mixer	1 No.		
9.	DVD Recorder / Player	1 No.		
10.	LCD Projector with MP3 /CD /DVD provision for audio / video facility - **Desirable**	1 No.	Available / Not Available	

L: 45, T: 15, TOTAL= 60 PERIODS

CS2353   **OBJECT ORIENTED ANALYSIS AND DESIGN**   **L T P C**
                                                                      3 0 0 3

OBJECTIVES

- To learn basic OO analysis and design skills through an elaborate case study.
- To use the UML design diagrams
- To apply the appropriate design patterns

UNIT I   **9**
Introduction to OOAD – What is OOAD? – What is UML? What are the United process(UP) phases - Case study – the NextGen POS system, Inception -Use case Modeling - Relating Use cases – include, extend and generalization.

UNIT II **9**

Elaboration - Domain Models - Finding conceptual classes and description classes – Associations – Attributes – Domain model refinement – Finding conceptual class hierarchies- Aggregation and Composition- UML activity diagrams and modeling

UNIT III **9**

System sequence diagrams - Relationship between sequence diagrams and use cases Logical architecture and UML package diagram – Logical architecture refinement - UML class diagrams - UML interaction diagrams

UNIT IV **9**

GRASP: Designing objects with responsibilities – Creator – Information expert – Low Coupling –Controller – High Cohesion – Designing for visibility - Applying GoF design patterns – adapter, singleton, factory and observer patterns.

UNIT V **9**

UML state diagrams and modeling - Operation contracts- Mapping design to code -UML deployment and component diagrams

TOTAL : 45 PERIODS

TEXT BOOK:
1. Craig Larman,"Applying UML and Patterns: An Introduction to object-oriented Analysis and Design and iterative development", Third Edition, Pearson Education, 2005

REFERENCES:
1. Mike O'Docherty, "Object-Oriented Analysis & Design: Understanding System Development with UML 2.0", John Wiley & Sons, 2005.
2. James W- Cooper, Addison-Wesley, "Java Design Patterns – A Tutorial", 2000.
3. Micheal Blaha, James Rambaugh, "Object-Oriented Modeling and Design with UML", Second Edition, Prentice Hall of India Private Limited, 2007
4. Erich Gamma, Richard Helm, Ralph Johnson, John Vlissides,**"**Design patterns: Elements of Reusable object-oriented software", Addison-Wesley, 1995.

CS2032 **DATA WAREHOUSING AND DATA MINING** **L T P C**
3 0 0 3

UNIT I **DATA WAREHOUSING** **10**

Data warehousing Components –Building a Data warehouse –- Mapping the Data Warehouse to a Multiprocessor Architecture – DBMS Schemas for Decision Support – Data Extraction, Cleanup, and Transformation Tools –Metadata.

UNIT II **BUSINESS ANALYSIS** **8**

Reporting and Query tools and Applications – Tool Categories – The Need for Applications – Cognos Impromptu – Online Analytical Processing (OLAP) – Need – Multidimensional Data Model – OLAP Guidelines – Multidimensional versus Multirelational OLAP – Categories of Tools – OLAP Tools and the Internet.

UNIT III   DATA MINING   8

Introduction – Data – Types of Data – Data Mining Functionalities – Interestingness of Patterns – Classification of Data Mining Systems – Data Mining Task Primitives – Integration of a Data Mining System with a Data Warehouse – Issues –Data Preprocessing.

UNIT IV   ASSOCIATION RULE MINING AND CLASSIFICATION   11

Mining Frequent Patterns, Associations and Correlations – Mining Methods – Mining Various Kinds of Association Rules – Correlation Analysis – Constraint Based Association Mining – Classification and Prediction - Basic Concepts - Decision Tree Induction - Bayesian Classification – Rule Based Classification – Classification by Backpropagation – Support Vector Machines – Associative Classification – Lazy Learners – Other Classification Methods - Prediction

UNIT V   CLUSTERING AND APPLICATIONS AND TRENDS IN DATA MINING 8

Cluster Analysis - Types of Data – Categorization of Major Clustering Methods - K-means – Partitioning Methods – Hierarchical Methods - Density-Based Methods –Grid Based Methods – Model-Based Clustering Methods – Clustering High Dimensional Data - Constraint – Based Cluster Analysis – Outlier Analysis – Data Mining Applications.

TEXT BOOKS:
1. Alex Berson and Stephen J. Smith, " Data Warehousing, Data Mining & OLAP", Tata McGraw – Hill Edition, Tenth Reprint 2007.
2. Jiawei Han and Micheline Kamber, "Data Mining Concepts and Techniques", Second Edition, Elsevier, 2007.

REFERENCES:
1. Pang-Ning Tan, Michael Steinbach and Vipin Kumar, " Introduction To Data Mining", Person Education, 2007.
2. K.P. Soman, Shyam Diwakar and V. Ajay ", Insight into Data mining Theory and Practice", Easter Economy Edition, Prentice Hall of India, 2006.
3. G. K. Gupta, " Introduction to Data Mining with Case Studies", Easter Economy Edition, Prentice Hall of India, 2006.
4. Daniel T.Larose, "Data Mining Methods and Models", Wile-Interscience, 2006.

IT2351   NETWORK PROGRAMMING AND MANAGEMENT   L T P C
3 0 0 3

UNIT I   ELEMENTARY TCP SOCKETS   9

Introduction to Socket Programming – Overview of TCP/IP Protocols –Introduction to Sockets – Socket address Structures – Byte ordering functions – address conversion functions – Elementary TCP Sockets – socket, connect, bind, listen, accept, read, write, close functions – Iterative Server – Concurrent Server.

UNIT II   APPLICATION DEVELOPMENT   9

TCP Echo Server – TCP Echo Client – Posix Signal handling – Server with multiple clients – boundary conditions: Server process Crashes, Server host Crashes, Server Crashes and reboots, Server Shutdown – I/O multiplexing – I/O Models – select function – shutdown function – TCP echo Server (with multiplexing) – poll function – TCP echo Client (with Multiplexing).

UNIT III   SOCKET OPTIONS, ELEMENTARY UDP SOCKETS   9

Socket options – getsocket and setsocket functions – generic socket options – IP socket options – ICMP socket options – TCP socket options – Elementary UDP sockets – UDP echo Server – UDP echo Client – Multiplexing TCP and UDP sockets – Domain name system – gethostbyname function – Ipv6 support in DNS – gethostbyadr function – getservbyname and getservbyport functions.

UNIT IV   ADVANCED SOCKETS   9

Ipv4 and Ipv6 interoperability – threaded servers – thread creation and termination – TCP echo server using threads – Mutexes – condition variables – raw sockets – raw socket creation – raw socket output – raw socket input – ping program – trace route program.

UNIT V   SIMPLE NETWORK MANAGEMENT   9

SNMP network management concepts – SNMP management information – standard MIB's – SNMPv1 protocol and Practical issues – introduction to RMON, SNMPv2 and SNMPvUNIT III

TOTAL :45 PERIODS

TEXT BOOKS:
1.   W. Richard Stevens, "Unix Network Programming Vol-I", Second Edition, Pearson Education, 1998.
2.   Mani Subramaniam, "Network Management: Principles and Practice", Addison Wesley", First Edition, 2001.

REFERENCES:
1.   D.E. Comer, "Internetworking with TCP/IP Vol- III", (BSD Sockets Version), Second Edition, Pearson Education, 200UNIT III
2.   William Stallings, "SNMP, SNMPv2, SNMPv3 and RMON 1 and 2",Third Edition, Addison Wesley, 1999.

IT2352   CRYPTOGRAPHY AND NETWORK SECURITY   L T P C
**   3 0 0 3**

UNIT I   9

Security trends – Attacks and services – Classical crypto systems – Different types of ciphers – LFSR sequences – Basic Number theory – Congruences – Chinese Remainder theorem – Modular exponentiation – Fermat and Euler's theorem – Legendre and Jacobi symbols – Finite fields – continued fractions.

UNIT II   9

Simple DES – Differential cryptoanalysis – DES – Modes of operation – Triple DES – AES – RC4 – RSA – Attacks – Primality test – factoring.

UNIT III **9**

Discrete Logarithms – Computing discrete logs – Diffie-Hellman key exchange – ElGamal Public key cryptosystems – Hash functions – Secure Hash – Birthday attacks - MD5 – Digital signatures – RSA – ElGamal – DSA.

UNIT IV **9**

Authentication applications – Kerberos, X.509, PKI – Electronic Mail security – PGP, S/MIME – IP security – Web Security – SSL, TLS, SET.

UNIT V **9**

System security – Intruders – Malicious software – viruses – Firewalls – Security Standards.

TOTAL:45 PERIODS

TEXT BOOKS:

1. Wade Trappe, Lawrence C Washington, " Introduction to Cryptography with coding theory", 2nd ed, Pearson, 2007.
2. William Stallings, "Crpyptography and Network security Principles and Practices", Pearson/PHI, 4th ed, 2006.

REFERENCES:

1. W. Mao, "Modern Cryptography – Theory and Practice", Pearson Education, Second Edition, 2007.
2. Charles P. Pfleeger, Shari Lawrence Pfleeger – Security in computing Third Edition – Prentice Hall of India, 2006

IT2353 **WEB TECHNOLOGY** **L T P C**
3 0 0 3

UNIT I **9**

Web Essentials: Clients, Servers, and Communication. The Internet-Basic Internet Protocols -The World Wide Web-HTTP request message-response message-Web Clients Web Servers-Case Study. Markup Languages: XHTML. An Introduction to HTML History-Versions-Basic XHTML Syntax and Semantics-Some Fundamental HTML Elements-Relative URLs-Lists-tables-Frames-Forms-XML Creating HTML Documents Case Study.

UNIT II **9**

Style Sheets: CSS-Introduction to Cascading Style Sheets-Features-Core Syntax-Style Sheets and HTML Style Rle Cascading and Inheritance-Text Properties-Box Model Normal Flow Box Layout-Beyond the Normal Flow-Other Properties-Case Study. Client-Side Programming: The JavaScript Language-History and Versions Introduction JavaScript in Perspective-Syntax-Variables and Data Types-Statements-Operators-Literals-Functions-Objects-Arrays-Built-in Objects-JavaScript Debuggers.

UNIT III **9**

Host Objects : Browsers and the DOM-Introduction to the Document Object Model DOM History and Levels-Intrinsic Event Handling-Modifying Element Style-The Document Tree-DOM Event Handling-Accommodating Noncompliant Browsers Properties of window-Case Study. Server-Side Programming: Java Servlets- Architecture -Overview-A Servelet-Generating Dynamic Content-Life Cycle-Parameter Data-Sessions-Cookies-URL Rewriting-Other Capabilities-Data Storage Servelets and Concurrency-Case Study-Related Technologies.

UNIT IV **9**

Representing Web Data: XML-Documents and Vocabularies-Versions and Declaration - Namespaces JavaScript and XML: Ajax-DOM based XML processing Event-oriented Parsing: SAX-Transforming XML Documents-Selecting XML Data:XPATH-Template-based Transformations: XSLT-Displaying XML Documents in Browsers-Case Study-Related Technologies. Separating Programming and Presentation: JSP Technology Introduction-JSP and Servlets-Running JSP Applications Basic JSP-JavaBeans Classes and JSP-Tag Libraries and Files-Support for the Model-View-Controller Paradigm-Case Study-Related Technologies.

UNIT V **9**

Web Services: JAX-RPC-Concepts-Writing a Java Web Service-Writing a Java Web Service Client-Describing Web Services: WSDL- Representing Data Types: XML Schema-Communicating Object Data: SOAP Related Technologies-Software Installation-Storing Java Objects as Files-Databases and Java Servlets.

TEXT BOOK

1. Jeffrey C.Jackson, "Web Technologies--A Computer Science Perspective", Pearson Education, 2006.

REFERENCES

1. Robert. W. Sebesta, "Programming the World Wide Web", Fourth Edition, Pearson Education, 2007.
2. Deitel, Deitel, Goldberg, "Internet & World Wide Web How To Program", Third Edition, Pearson Education, 2006.
3. Marty Hall and Larry Brown,"Core Web Programming" Second Edition, Volume I and II, Pearson Education, 2001.
4. Bates, "Developing Web Applications", Wiley, 2006.

IT2354	EMBEDDED SYSTEMS	L T P C
		3 0 0 3

UNIT I   EMBEDDED COMPUTING **9**

Challenges of Embedded Systems – Embedded system design process. Embedded processors – 8051 Microcontroller, ARM processor – Architecture, Instruction sets and programming.

UNIT II   MEMORY AND INPUT / OUTPUT MANAGEMENT **9**

Programming Input and Output – Memory system mechanisms – Memory and I/O devices and interfacing – Interrupts handling.

UNIT III PROCESSES AND OPERATING SYSTEMS 9

Multiple tasks and processes – Context switching – Scheduling policies – Interprocess communication mechanisms – Performance issues.

UNIT IV EMBEDDED SOFTWARE 9

Programming embedded systems in assembly and C – Meeting real time constraints – Multi-state systems and function sequences. Embedded software development tools – Emulators and debuggers.

UNIT V EMBEDDED SYSTEM DEVELOPMENT 9

Design issues and techniques – Case studies – Complete design of example embedded systems.

TOTAL : 45PERIODS

TEXT BOOKS
1. Wayne Wolf, "Computers as Components: Principles of Embedded Computer System Design", Elsevier, 2006.
2. Michael J. Pont, "Embedded C", Pearson Education , 2007.

REFERENCES:
1. Steve Heath, "Embedded System Design", Elsevier, 2005.
2. Muhammed Ali Mazidi, Janice Gillispie Mazidi and Rolin D. McKinlay, "The 8051 Microcontroller and Embedded Systems", Pearson Education, Second edition, 2007.

IT2357 **WEB TECHNOLOGY LAB** **L T P C**
0 0 3 2

LIST OF EXPERIMENTS

1. Create a web page with the following using HTML

   i)   To embed an image map in a web page
   ii)   To fix the hot spots
   iii)   Show all the related information when the hot spots are clicked.

2. Create a web page with all types of Cascading style sheets.

3. Client Side Scripts for Validating Web Form Controls using DHTML

4. Write programs in Java to create applets incorporating the following features:

   • Create a color palette with matrix of buttons
   • Set background and foreground of the control text area by selecting a color from color palette.
   • In order to select Foreground or background use check box control as radio buttons
   • To set background images

5. Write programs in Java using Servlets:

- To invoke servlets from HTML forms
- To invoke servlets from Applets

6. Write programs in Java to create three-tier applications using JSP and Databases

- for conducting on-line examination.
- for displaying student mark list. Assume that student information is available in a database which has been stored in a database server.

7. Programs using XML – Schema – XSLT/XSL

8. Programs using AJAX

9. Consider a case where we have two web Services- an airline service and a travel agent and the travel agent is searching for an airline. Implement this scenario using Web Services and Data base.

CS2357   OBJECT ORIENTED ANALYSIS AND DESIGN LAB   L T P C
0 0 3 2

OBJECTIVES:
To develop a mini-project following the 12 exercises listed below.

1. To develop a problem statement.
2. Develop an IEEE standard SRS document. Also develop risk management and project plan (Gantt chart).
3. Identify Use Cases and develop the Use Case model.
4. Identify the business activities and develop an UML Activity diagram.
5. Identity the conceptual classes and develop a domain model with UML Class diagram.
6. Using the identified scenarios find the interaction between objects and represent them using UML Interaction diagrams.
7. Draw the State Chart diagram.
8. Identify the User Interface, Domain objects, and Technical services. Draw the partial layered, logical architecture diagram with UML package diagram notation.
9. Implement the Technical services layer.
10. Implement the Domain objects layer.
11. Implement the User Interface layer.
12. Draw Component and Deployment diagrams.

Suggested domains for Mini-project.

1. Passport automation system.
2. Book bank
3. Exam Registration
4. Stock maintenance system.
5. Online course reservation system
6. E-ticketing
7. Software personnel management system
8. Credit card processing
9. e-book management system
10. Recruitment system
11. Foreign trading system
12. Conference Management System
13. BPO Management System

Suggested Software Tools

ArgoUML, Eclipse IDE, Visual Paradigm, Visual case, and Rational Suite

CS2307   **NETWORKS LAB**   **L T P C**
                                                                    0 0 3 2

1. Programs using TCP Sockets (like date and time server & client, echo server & client, etc.)
2. Programs using UDP Sockets (like simple DNS)
3. Programs using Raw sockets (like packet capturing and filtering)
4. Programs using RPC
5. Simulation of sliding window protocols
6. Experiments using simulators (like OPNET)
7. Performance comparison of MAC protocols
8. Performance comparison of Routing protocols
9. Study of TCP/UDP performance

TOTAL: 60 PERIODS

IT2401   **SERVICE ORIENTED ARCHITECTURE**   **L T P C**
                                                                    3 0 0 3

OBJECTIVES:
- To gain understanding of the basic principles of service orientation
- To learn service oriented analysis techniques
- To learn technology underlying the service design
- To learn advanced concepts such as service composition, orchestration and Choreography
- To know about various WS-* specification standards

UNIT I   **9**
Roots of SOA – Characteristics of SOA - Comparing SOA to client-server and distributed internet architectures – Anatomy of SOA- How components in an SOA interrelate - Principles of service orientation

UNIT II   **9**
Web services – Service descriptions – Messaging with SOAP –Message exchange Patterns – Coordination –Atomic Transactions – Business activities – Orchestration – Choreography - Service layer abstraction – Application Service Layer – Business Service Layer – Orchestration Service Layer

UNIT III   **9**
Service oriented analysis – Business-centric SOA – Deriving business services- service modeling - Service Oriented Design – WSDL basics – SOAP basics – SOA composition guidelines – Entity-centric business service design – Application service design – Task-centric business service design

UNIT IV   **9**

SOA platform basics – SOA support in J2EE – Java API for XML-based web services (JAX-WS) - Java architecture for XML binding (JAXB) – Java API for XML Registries (JAXR) - Java API for XML based RPC (JAX-RPC)- Web Services Interoperability Technologies (WSIT) - SOA support in .NET – Common Language Runtime - ASP.NET web forms – ASP.NET web services – Web Services Enhancements (WSE)

UNIT V   **9**

WS-BPEL basics – WS-Coordination overview - WS-Choreography, WS-Policy, WS-Security

                          TOTAL : 45 PERIODS

TEXT BOOKS:

1. Thomas Erl**, "**Service-Oriented Architecture: Concepts, Technology, and Design", Pearson Education, 2005.

REFERENCES:

1. Thomas Erl, "SOA Principles of Service Design "(The Prentice Hall Service-Oriented Computing Series from Thomas Erl), 2005.
2. Newcomer, Lomow, "Understanding SOA with Web Services", Pearson Education, 2005.
3. Sandeep Chatterjee, James Webber, "Developing Enterprise Web Services, An Architect's Guide", Pearson Education, 2005.
4. Dan Woods and Thomas Mattern, "Enterprise SOA Designing IT for Business Innovation" O'REILLY, First Edition, 2006

   IT2402   **MOBILE COMMUNICATION**   **L T P C**
                                                         3 0 0 3

UNIT I   **WIRELESS COMMUNICATION**   **7**

Cellular systems- Frequency Management and Channel Assignment- types of handoff and their characteristics, dropped call rates & their evaluation -MAC – SDMA – FDMA – TDMA – CDMA – Cellular Wireless Networks

UNIT II   **WIRELESS NETWORKS**   **9**

Wireless LAN – IEEE 802.11 Standards – Architecture – Services – Mobile Ad hoc Networks- WiFi and WiMAX - Wireless Local Loop

UNIT III   **MOBILE COMMUNICATION SYSTEMS**   **11**

GSM-architecture-Location tracking and call setup- Mobility management- Handover-Security-GSM SMS –International roaming for GSM- call recording functions-subscriber and service data mgt –-Mobile Number portability -VoIP service for Mobile Networks – GPRS –Architecture-GPRS procedures-attach and detach procedures-PDP context procedure-combined RA/LA update procedures-Billing

UNIT IV   MOBILE NETWORK AND TRANSPORT LAYERS   9
Mobile IP – Dynamic Host Configuration Protocol-Mobile Ad Hoc Routing Protocols–
Multicast routing-TCP over Wireless Networks – Indirect TCP – Snooping TCP – Mobile
TCP – Fast Retransmit / Fast Recovery – Transmission/Timeout Freezing-Selective
Retransmission – Transaction Oriented TCP- TCP over 2.5 / 3G wireless Networks

UNIT V   APPLICATION LAYER   9
WAP Model- Mobile Location based services -WAP Gateway –WAP protocols – WAP
user agent profile- caching model-wireless bearers for WAP - WML – WMLScripts - WTA
- iMode- SyncML

TOTAL :45PERIODS

TEXT BOOKS:

1. Jochen Schiller, "Mobile Communications", Second Edition, Pearson Education,
   200UNIT III
2. William Stallings, "Wireless Communications and Networks", Pearson Education,
   2002.

REFERENCES:

1. Kaveh Pahlavan, Prasanth Krishnamoorthy, "Principles of Wireless Networks", First
   Edition, Pearson Education, 200UNIT III
2. Uwe Hansmann, Lothar Merk, Martin S. Nicklons and Thomas Stober, "Principles of
   Mobile Computing", Springer, 200UNIT III
3. C.K.Toh, "AdHoc Mobile Wireless Networks", First Edition, Pearson Education, 2002.

CS2401   **COMPUTER GRAPHICS**   **L T P C**
3 0 0 3

UNIT I   2D PRIMITIVES   9
Output primitives – Line, Circle and Ellipse drawing algorithms - Attributes of output
primitives – Two dimensional Geometric transformation - Two dimensional viewing –
Line, Polygon, Curve and Text clipping algorithms

UNIT II   3D CONCEPTS   9
Parallel and Perspective projections - Three dimensional object representation –
Polygons, Curved lines, Splines, Quadric Surfaces,- Visualization of data sets - 3D
transformations – Viewing -Visible surface identification.

UNIT III   GRAPHICS PROGRAMMING   9
Color Models – RGB, YIQ, CMY, HSV – Animations – General Computer Animation,
Raster, Keyframe - Graphics programming using OPENGL – Basic graphics primitives –
Drawing three dimensional objects - Drawing three dimensional scenes

UNIT IV   RENDERING   9
Introduction to Shading models – Flat and Smooth shading – Adding texture to faces –
Adding shadows of objects – Building a camera in a program – Creating shaded objects
– Rendering texture – Drawing Shadows.

UNIT V   FRACTALS   9

Fractals and Self similarity – Peano curves – Creating image by iterated functions – Mandelbrot sets – Julia Sets – Random Fractals – Overview of Ray Tracing – Intersecting rays with other primitives – Adding Surface texture – Reflections and Transparency – Boolean operations on Objects

                                                        TOTAL :45PERIODS

TEXT BOOKS:
1. Donald Hearn, Pauline Baker, Computer Graphics – C Version, second edition, Pearson Education,2004.
2. F.S. Hill, Computer Graphics using OPENGL, Second edition, Pearson Education,200UNIT III

REFERENCES:
1. James D. Foley, Andries Van Dam, Steven K. Feiner, John F. Hughes, Computer Graphics- Principles and practice, Second Edition in C, Pearson Education, 2007.

IT2403   SOFTWARE PROJECT MANAGEMENT   L T P C
                                                                3 0 0 3

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 –Network Planning 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: 45PERIODS

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.

IT2406   SERVICE ORIENTED ARCHITECTURE LABORATORY   L T P C
0 0 3 2

1. Develop at least 5 components such as Order Processing, Payment Processing, etc., using .NET component technology.
2. Develop at least 5 components such as Order Processing, Payment Processing, etc., using EJB component technology.
3. Invoke .NET components as web services.
4. Invoke EJB components as web services.
5. Develop a Service Orchestration Engine (workflow) using WS-BPEL and implement service composition. For example, a business process for planning business travels will invoke several services. This process will invoke several airline companies (such as American Airlines, Delta Airlines etc.) to check the airfare price and buy at the lowest price.
6. Develop a J2EE client to access a .NET web service.
7. Develop a .NET client to access a J2EE web service.

TOTAL: 60 PERIODS

CS2405   COMPUTER GRAPHICS LABORATORY   L T P C
0 0 3 2

Implementation of Bresenhams Algorithm – Line, Circle, Ellipse.
1. Implementation of Line, Circle and ellipse Attributes.
2. Two Dimensional transformations - Translation, Rotation, Scaling, Reflection, Shear.
3. Composite 2D Transformations.
4. Cohen Sutherland 2D line clipping and Windowing
5. Sutherland – Hodgeman Polygon clipping Algorithm.
6. Three dimensional transformations - Translation, Rotation, Scaling.
7. Composite 3D transformations.
8. Drawing three dimensional objects and Scenes.
9. Generating Fractal images.

TOTAL: 60 PERIODS

MA2264   **NUMERICAL METHODS**   **L T P C**
                                                                       3 1 0 4

AIM

> With the present development of the computer technology, it is necessary to develop efficient algorithms for solving problems in science, engineering and technology. This course gives a complete procedure for solving different kinds of problems occur in engineering numerically.

OBJECTIVES

At the end of the course, the students would be acquainted with the basic concepts in numerical methods and their uses are summarized as follows:

i.   The roots of nonlinear (algebraic or transcendental) equations, solutions of large system of linear equations and eigen value problem of a matrix can be obtained numerically where analytical methods fail to give solution.

ii. 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.

iii. The numerical differentiation and integration find application when the function in the analytical form is too complicated or the huge amounts of data are given such as series of measurements, observations or some other empirical information.

iv. Since many physical laws are couched in terms of rate of change of one/two or more independent variables, most of the engineering problems are characterized in the form of either nonlinear ordinary differential equations or partial differential equations. The methods introduced in the solution of ordinary differential equations and partial differential equations will be useful in attempting any engineering problem.

UNIT I   SOLUTION OF EQUATIONS AND EIGENVALUE PROBLEMS   9

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

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

UNIT III   NUMERICAL DIFFERENTIATION AND INTEGRATION   9

Differentiation using interpolation formulae –Numerical integration by trapezoidal and Simpson's 1/3 and 3/8 rules – Romberg's method – Two and Three point Gaussian quadrature formulae – Double integrals using trapezoidal and Simpsons's rules.

UNIT IV   INITIAL VALUE PROBLEMS FOR ORDINARY DIFFERENTIAL
                 EQUATIONS   9

Single step methods: Taylor series method – 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.

**UNIT V   BOUNDARY VALUE PROBLEMS IN ORDINARY AND PARTIAL
                  DIFFERENTIAL EQUATIONS   9**

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.

L = 45   TOTAL : 45 PERIODS

TEXT BOOKS

1. Veerarjan, T and Ramachandran, T. 'Numerical methods with programming in 'C' Second Editiion, Tata McGraw-Hill Publishing.Co.Ltd. (2007).
2. Sankara Rao K, 'Numerical Methods for Scientisits and Engineers' – 3rd editiion Printice Hall of India Private Ltd, New Delhi, (2007).

REFERENCES:

1. Chapra, S. C and Canale, R. P. "Numerical Methods for Engineers", 5th Edition, Tata McGraw-Hill, New Delhi, 2007.
2. Gerald, C. F. and Wheatley, P.O., "Applied Numerical Analysis", 6th Edition, Pearson Education Asia, New Delhi, 2006.
3. Grewal, B.S. and Grewal,J.S., " Numerical methods in Engineering and Science", 6th Edition, Khanna Publishers, New Delhi, 2004

**MA2265   DISCRETE MATHEMATICS   L T P C
                                                                        3 1 0 4**

AIM

To extend student's Logical and Mathematical maturity and ability to deal with abstraction and to introduce most of the basic terminologies used in computer science courses and application of ideas to solve practical problems.

OBJECTIVES

At the end of the course, students would

- Have knowledge of the concepts needed to test the logic of a program..
- Have an understanding in identifying structures on many levels.
- Be aware of a class of functions which transform a finite set into another finite set which relates to input output functions in computer science.
- Be aware of the counting principles
- Be exposed to concepts and properties of algebraic structures such as semi groups, monoids and groups.

UNIT I   LOGIC AND PROOFS   9 + 3

Propositional Logic – Propositional equivalences-Predicates and quantifiers-Nested Quantifiers-Rules of inference-introduction to Proofs-Proof Methods and strategy

UNIT II   COMBINATORICS   9 + 3

Mathematical inductions-Strong induction and well ordering-.The basics of counting-The pigeonhole principle –Permutations and combinations-Recurrence relations-Solving Linear recurrence relations-generating functions-inclusion and exclusion and applications.

UNIT III   GRAPHS   9 + 3

Graphs and graph models-Graph terminology and special types of graphs-Representing graphs and graph isomorphism-connectivity-Euler and Hamilton paths

UNIT IV   ALGEBRAIC STRUCTURES   9 + 3

Algebraic systems-Semi groups and monoids-Groups-Subgroups and homomorphisms-Cosets and Lagrange's theorem- Ring & Fields (Definitions and examples)

UNIT V   LATTICES AND BOOLEAN ALGEBRA   9 + 3

Partial ordering-Posets-Lattices as Posets- Properties of lattices-Lattices as Algebraic systems –Sub lattices –direct product and Homomorphism-Some Special lattices-Boolean Algebra

LECTURES :45   TUTORIAL :15 TOTAL: 60 PERIODS

TEXT BOOKS:

1. Kenneth H.Rosen, "Discrete Mathematics and its Applications", Special Indian edition, Tata McGraw-Hill Pub. Co. Ltd., New Delhi, (2007). (For the units 1 to 3, Sections 1.1 to 1.7 , 4.1 & 4.2, 5.1 to 5.3, 6.1, 6.2, 6.4 to 6.6, 8.1 to 8.5)
2. Trembly J.P and Manohar R, "Discrete Mathematical Structures with Applications to Computer Science", Tata McGraw–Hill Pub. Co. Ltd, New Delhi, 30th Re-print (2007).(For units 4 & 5 , Sections 2-UNIT III8 & 2-UNIT III9,3-1,3-2 & 3-5, 4-1 & 4-2)

REFERENCES:

1. Ralph. P. Grimaldi, "Discrete and Combinatorial Mathematics: An Applied Introduction", Fourth Edition, Pearson Education Asia, Delhi, (2002).
2. Thomas Koshy, "Discrete Mathematics with Applications", Elsevier Publications, (2006).
3. Seymour Lipschutz and Mark Lipson, "Discrete Mathematics", Schaum's Outlines, Tata McGraw-Hill Pub. Co. Ltd., New Delhi, Second edition, (2007).

IT2021   BUSINESS PROCESS MODEL   L T P C
                                                                        3 0 0 3

UNIT I   ORGANIZATIONAL STRUCTURE   9

Types of Business Organizations-Organizational Structures-Definition-Complexity-Formulization-Size-Technology-Culture-Forms and Outcomes-Explanations of Structures-IT Industry and Organizational Structures-Processes of organizations-Case Studies

UNIT II   PROCESS FLOW MEASUREMENT   9

Process flow measures - flow rate - flow time - inventory - flow-time analysis - process flow chart - flow-time measurement - CPM - managing flow-time - flow-rate and capacity analysis - resources and resource pools - flow-rate measurement - process capacity - inventory analysis

UNIT III   PROCESS FLOW VARIABILITY   9
Managing flow variability - safety inventory - demand forecasts and forecast errors - optimal services level - lead time demand variability - safety capacity - service processes and performance measures - queueing process - buffer capacity - synchronization and capacity and demand - process control and capability - performance variability - process capability measurement and improvement - product and process design - process synchronization and improvement

UNIT IV   BUSINESS PROCESS REENGINEERING   9
Introduction to Business Process Re-engineering (BPR)-Meaning-Types-Process-Impetrative for Survival-Strategic Approach-Implementing Business Process Re-engineering-Methodology and Steps-Indian Scenario of Implementing BPR-Case Studies

UNIT V   BPR AND IT INDUSTRY   9
BPR and Information Technology Process-People View and Perspectives-Empowering People through IT-Managing Change in the Global Environment-BPR Rediscovering Indian Paradigm-Need of Reengineering-Case Studies

                                                                TOTAL : 45 PERIODS

TEXTBOOKS:
1. Richard H.Hall, "Organizations - Structures, Processes and Outcomes", Pearson Education, 2004
2. Ravi Anupindi et. al., "Managing Business Process Flows", Pearson Education, 1999.
3. M.S.Jayaraman et. al, "Business Process Reengineering", Tata Mc Graw Hill Publications, 2001

REFERENCES

1. Gareth Jones, "Organizational Theory, Design and Change", Pearson Education, 4th Edition, 2004
2. John Jeston and Johan Nelis, "Business Process Management", Elsevier, 2006.

**IT2022   SOFTWARE REQUIREMENT ENGINEERING   L T P C
                                                         3 0 0 3**

UNIT I   INTRODUCTION   9
Introduction - Requirements Problem – Requirements management – Requirements and software life cycle-software team.

UNIT II   ANALYSING THE PROLEM   9
The five steps in problem analysis– business modeling – Systems engineering of software intensive systems – Understanding user and stakeholders needs – Features of a product or system –Interviewing – Requirements workshops- Brain storming and Idea reduction- storyboarding

UNIT III   DEFINING THE SYSTEM   9
Use case primer-Organizing requirement Information-Vision Document-Product Management-Managing scope-Establishing Project scope-Managing customer

UNIT IV   REFINING THE SYSTEM DEFINITION   9
Software requirement-Refining the use cases-developing the supplementary specification- Ambiguity and specificity -Technical methods for specifying requirements

UNIT V   BUILDING THE RIGHT SYSTEM   9
From use cases to Implementation-From use Cases to Test cases-Tracing requirements-Managing Change-Assessing Requirements Quality in Iterative Development-Agile Requirement methods.

TOTAL : 45 PERIODS

TEXT BOOK:
1. Leffingwell, D., Widrig, D., "Managing Software Requirements A Use case approach", Second Edition, Pearson Education, 200UNIT III

REFERENCES:
1.. Swapna Kishore, Rajesh Naik, "Software Requirements and Estimation", Tata McGraw Hill, 2001
2. K.Weigers, Software Requirements, Microsoft Press, 1999.
3 Ian Sommerville and P Sawyer, "Requirements engineering a good practice Guide", Wiley India, 1997

IT2023   **DIGITAL IMAGE PROCESSING**   **L T P C**
                                                              3 0 0 3

AIM:
The aim is to inculcate a basic training in the processing of images for practical applications in the domain of medical, remoting sessions and in general.

OBJECTIVES:
- To introduce basic concepts in acquiring, storage and Process of images
- To introduce for enhancing the quality of images.
- To introduce techniques for extraction and processing of region of interest
- To introduce case studies of Image Processing.

UNIT I   FUNDAMENTALS OF IMAGE PROCESSING   9
Introduction – Steps in Image Processing Systems – Image Acquisition – Sampling and Quantization – Pixel Relationships – Colour Fundamentals and Models, File Formats, Image operations – Arithmetic, Geometric and Morphological.

UNIT II   IMAGE ENHANCEMENT   9
Spatial Domain Gray level Transformations Histogram Processing Spatial Filtering – Smoothing and Sharpening. Frequency Domain : Filtering in Frequency Domain – DFT, FFT, DCT – Smoothing and Sharpening filters – Homomorphic Filtering.

UNIT III   IMAGE SEGMENTATION AND FEATURE ANALYSIS   9

Detection of Discontinuities – Edge Operators – Edge Linking and Boundary Detection – Thresholding – Region Based Segmentation – Morphological WaterSheds – Motion Segmentation, Feature Analysis and Extraction.

UNIT IV   MULTI RESOLUTION ANALYSIS AND COMPRESSIONS   9

Multi Resolution Analysis : Image Pyramids – Multi resolution expansion – Wavelet Transforms.

Image Compression : Fundamentals – Models – Elements of Information Theory – Error Free Compression – Lossy Compression – Compression Standards.

UNIT V   APPLICATIONS OF IMAGE PROCESSING   9

Image Classification – Image Recognition – Image Understanding – Video Motion Analysis – Image Fusion – Steganography – Digital Compositing – Mosaics – Colour Image Processing..

TOTAL :45 PERIODS

TEXT BOOK:

1. Rafael C.Gonzalez and Richard E.Woods, "Digital Image Processing" Second Edition, Pearson Education, 200UNIT III

REFERENCES:

1. Milan Sonka, Vaclav Hlavac and Roger Boyle, "Image Processing, Analysis and Machine Vision", Second Edition, Thomson Learning, 2001
2. Anil K.Jain, "Fundamentals of Digital Image Processing", PHI, 2006.
3. Sanjit K. Mitra, & Giovanni L. Sicuranza, "Non Linear Image Processing",
4. Elsevier, 2007.
5. Richard O. Duda, Peter E. HOF, David G. Stork, "Pattern Classification" Wiley Student Edition, 2006.

IT2024   **USER INTERFACE DESIGN**   **L T P C**
                                                 3 0 0 3

UNIT I   INTRODUCTION   8

Human–Computer Interface – Characteristics Of Graphics Interface –Direct Manipulation Graphical System – Web User Interface –Popularity –Characteristic & Principles.

UNIT II   HUMAN COMPUTER INTERACTION   10

User Interface Design Process – Obstacles –Usability –Human Characteristics In Design – Human Interaction Speed –Business Functions –Requirement Analysis – Direct – Indirect Methods – Basic Business Functions – Design Standards – System Timings – Human Consideration In Screen Design – Structures Of Menus – Functions Of Menus– Contents Of Menu– Formatting – Phrasing The Menu – Selecting Menu Choice– Navigating Menus– Graphical Menus.

UNIT III   WINDOWS   9

Characteristics– Components– Presentation Styles– Types– Managements– Organizations– Operations– Web Systems– Device– Based Controls Characteristics– Screen – Based Controls – Operate Control – Text Boxes– Selection Control– Combination Control– Custom Control– Presentation Control.

UNIT IV   MULTIMEDIA   9
Text For Web Pages –   Effective Feedback– Guidance & Assistance–
Internationalization– Accesssibility– Icons– Image– Multimedia – Coloring.

UNIT V   WINDOWS LAYOUT– TEST   9
Prototypes – Kinds Of Tests –   Retest –   Information Search –   Visualization –
Hypermedia – WWW– Software Tools.

TOTAL: 45 PERIODS

TEXT BOOKS
1. Wilbent. O. Galitz ,"The Essential Guide To User Interface Design", John Wiley&
   Sons, 2001.
2. Ben Sheiderman, "Design The User Interface", Pearson Education, 1998.

REFERENCE:
1. Alan Cooper, "The Essential Of User Interface Design", Wiley – Dream Tech Ltd.,
   2002.

**CS2022   VISUAL PROGRAMMING   L T P C
                                                                 3 0 0 3**

UNIT I   9
Windows Programming Fundamentals – MFC – Windows – Graphics – Menus – Mouse
and keyboard – Bitmaps – Palettes – Device-Independent Bitmaps

UNIT II   9
Controls – Modal and Modeless Dialog – Property – Data I/O – Sound – Timer 1

UNIT III   9
Memory management – SDI – MDI – MFC for Advanced windows user Interface – status
bar and Toolbars – Tree view – List view – Threads

UNIT IV   9
ODBC – MFC Database classes – DAO - DLLs – Working with Images

UNIT V   9
COM Fundamentals – ActiveX control – ATL – Internet Programming

TOTAL: 45 PERIODS

TEXT BOOK:
1. Richard C.Leinecker and Tom Archer, "Visual C++ 6 Programming Bible", Wiley
   DreamTech Press, 2006.

REFERENCES:
1. Lars Klander, "Core Visual C++ 6", Pearson Education, 2000
2. Deital, Deital, Liperi and Yaeger "Visual V++ .NET How to Program" , Pearson
   Education, 2004.

CS2303   **THEORY OF COMPUTATION**   **L T P C**
                                                                         3 1 0 4

UNIT I   **AUTOMATA**   **9**
Introduction to formal proof – Additional forms of proof – Inductive proofs –Finite Automata (FA) – Deterministic Finite Automata (DFA) – Non-deterministic Finite Automata (NFA) – Finite Automata with Epsilon transitions.

UNIT II   **REGULAR EXPRESSIONS AND LANGUAGES**   **9**
Regular Expression – FA and Regular Expressions – Proving languages not to be regular – Closure properties of regular languages – Equivalence and minimization of Automata.

UNIT III   **CONTEXT-FREE GRAMMARS AND LANGUAGES**   **9**
Context-Free Grammar (CFG) – Parse Trees – Ambiguity in grammars and languages – Definition of the Pushdown automata – Languages of a Pushdown Automata – Equivalence of Pushdown automata and CFG– Deterministic Pushdown Automata.

UNIT IV   **PROPERTIES OF CONTEXT-FREE LANGUAGES**   **9**
Normal forms for CFG – Pumping Lemma for CFL – Closure Properties of CFL – Turing Machines – Programming Techniques for TM.

UNIT V   **UNDECIDABALITY**   **9**
A language that is not Recursively Enumerable (RE) – An undecidable problem that is RE – Undecidable problems about Turing Machine – Post's Correspondence Problem – The classes P and NP.

                                                   TOTAL : 45 PERIODS

TEXT BOOK:
1. J.E. Hopcroft, R. Motwani and J.D. Ullman, "Introduction to Automata Theory, Languages and Computations", second Edition, Pearson Education, 2007.

REFERENCES:
1. H.R. Lewis and C.H. Papadimitriou, "Elements of the theory of Computation", Second Edition, Pearson Education, 200UNIT III
2. Thomas A. Sudkamp," An Introduction to the Theory of Computer Science, Languages and Machines", Third Edition, Pearson Education, 2007.
3. Raymond Greenlaw an H.James Hoover, " Fundamentals of Theory of Computation, Principles and Practice", Morgan Kaufmann Publishers, 1998.
4. Micheal Sipser, "Introduction of the Theory and Computation", Thomson Brokecole, 1997.
5. J. Martin,"Introduction to Languages and the Theory of computation", 3rd Edition,Tata Mc Graw Hill, 2007

CS2351   **ARTIFICIAL INTELLIGENCE**   **L T P C**
                                                                          3 0 0 3

AIM:
To learn the basics of designing intelligent agents that can solve general purpose problems, represent and process knowledge, plan and act, reason under uncertainty and can learn from experiences

UNIT I　　　PROBLEM SOLVING　　　　　　　　　　　　　　　　9

Introduction – Agents – Problem formulation – uninformed search strategies – heuristics – informed search strategies – constraint satisfaction

UNIT II　　　LOGICAL REASONING　　　　　　　　　　　　　　9

Logical agents – propositional logic – inferences – first-order logic – inferences in first-order logic – forward chaining – backward chaining – unification – resolution

UNIT III　　PLANNING　　　　　　　　　　　　　　　　　　　9

Planning with state-space search – partial-order planning – planning graphs – planning and acting in the real world

UNIT IV　　UNCERTAIN KNOWLEDGE AND REASONING　　　9

Uncertainty – review of probability - probabilistic Reasoning – Bayesian networks – inferences in Bayesian networks – Temporal models – Hidden Markov models

UNIT V　　LEARNING　　　　　　　　　　　　　　　　　　　9

Learning from observation - Inductive learning – Decision trees – Explanation based learning – Statistical Learning methods - Reinforcement Learning

TOTAL: 45PERIODS

TEXT BOOK

1. S. Russel and P. Norvig, "Artificial Intelligence – A Modern Approach", Second Edition, Pearson Education, 200UNIT III

REFERENCES

1. David Poole, Alan Mackworth, Randy Goebel, "Computational Intelligence : a logical approach", Oxford University Press, 2004.
2. G. Luger, "Artificial Intelligence: Structures and Strategies for complex problem solving", Fourth Edition, Pearson Education, 2002.
3. J. Nilsson, "Artificial Intelligence: A new Synthesis", Elsevier Publishers, 1998.

CS2029　　　　　　**ADVANCED DATABASE TECHNOLOGY**　　　**L T P C**
　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　3 0 0 3

UNIT I　　　RELATIONAL MODEL ISSUES　　　　　　　　　9

ER Model - Normalization – Query Processing – Query Optimization - Transaction Processing - Concurrency Control – Recovery - Database Tuning**.**

UNIT II　　　DISTRIBUTED DATABASES　　　　　　　　　　9

Parallel Databases – Inter and Intra Query Parallelism – Distributed Database Features – Distributed Database Architecture – Fragmentation – Distributed Query Processing – Distributed Transactions Processing – Concurrency Control – Recovery – Commit Protocols.

UNIT III　　OBJECT ORIENTED DATABASES　　　　　　　9

Introduction to Object Oriented Data Bases - Approaches - Modeling and Design - Persistence – Query Languages - Transaction - Concurrency – Multi Version Locks – Recovery – POSTGRES – JASMINE –GEMSTONE - ODMG Model.

UNIT IV   EMERGING SYSTEMS   9
Enhanced Data Models - Client/Server Model - Data Warehousing and Data Mining -
Web Databases – Mobile Databases- XML and Web Databases.

UNIT V   CURRENT ISSUES   9
Rules - Knowledge Bases - Active and Deductive Databases - Multimedia Databases–
Multimedia Data Structures – Multimedia Query languages - Spatial Databases.

                                                          TOTAL : 45 PERIODS

TEXT BOOKS:
1. Thomas Connolly and Carlolyn Begg, "Database Systems, A Practical Approach   to
   Design, Implementation and Management", Third Edition, Pearson Education 200
   UNITIII

REFERENCES:

1. R. Elmasri, S.B. Navathe, "Fundamentals of Database Systems", Fifth Edition,
   Pearson Education, 2006.
2. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, "Database System Concepts",
   Fifth Edition, Tata McGraw Hill, 2006.
3. C.J.Date, A.Kannan, S.Swamynathan, "An Introduction to Database Systems", Eighth
   Edition, Pearson Education, 2006.

IT2031   **ELECTRONIC COMMERCE**   **L T P C**
                                                                   3 0 0 3

UNIT I   INTRODUCTION   9
Traditional commerce and E commerce – Internet and WWW – role of WWW – value
chains – strategic business and Industry value chains – role of E commerce.

UNIT II   INFRASTRUCTURE FOR E COMMERCE   9
Packet switched networks – TCP/IP protocol script – Internet utility programmes –
SGML, HTML and XML – web client and servers – Web client/server architecture –
intranet and extranets.

UNIT III   WEB BASED TOOLS FOR E COMMERCE   9
Web server – performance evaluation - web server software feature sets – web server
software and tools – web protocol – search engines – intelligent agents –EC software –
web hosting – cost analysis

UNIT IV   SECURITY   9
Computer security classification – copy right and Intellectual property – electronic
commerce threats – protecting client computers – electronic payment systems –
electronic cash – strategies for marketing – sales and promotion – cryptography –
authentication.

UNIT V   INTELLIGENT AGENTS   9

Definition and capabilities – limitation of agents – security – web based marketing – search engines and Directory registration – online advertisements – Portables and info mechanics – website design issues.

TOTAL = 45 PERIODS

TEXT BOOKS

1. Ravi Kalakota, " Electronic Commerce", Pearson Education,
2. Gary P Schneider "Electronic commerce", Thomson learning & James T Peny Cambridge USA, 2001.
3. Manlyn Greenstein and Miklos "Electronic commerce" McGraw-Hill, 2002.

REFERENCES
1. Efraim Turvan J.Lee, David kug and chung, "Electronic commerce" Pearson Education Asia 2001.
2. Brenda Kienew E commerce Business Prentice Hall, 2001.

IT2041   ENTERPRISE RESOURCE PLANNING   L T P C
3 0 0 3
UNIT I   RP AND TECHNOLOGY   10
Introduction – Related Technologies – Business Intelligence – E-Commerce and E-Business – Business Process Reengineering – Data Warehousing – Data Mining – OLAP – Product life Cycle management – SCM – CRM

UNIT II   ERP IMPLEMENTATION   10
Implementation Challenges – Strategies – Life Cycle – Pre-implementation Tasks – Requirements Definition – Methodologies – Package selection – Project Teams – Process Definitions – Vendors and Consultants – Data Migration – Project management – Post Implementation Activities.

UNIT III   ERP IN ACTION & BUSINESS MODULES   8
Operation and Maintenance – Performance – Maximizing the ERP System – Business Modules – Finance – Manufacturing – Human Resources – Plant maintenance – Materials Management – Quality management – Marketing – Sales, Distribution and service.

UNIT IV   ERP MARKET   9
Marketplace – Dynamics – SAP AG – Oracle – PeopleSoft – JD Edwards – QAD Inc – SSA Global – Lawson Software – Epicor – Intutive.

UNIT V   8
Enterprise Application Integration – ERP and E-Business – ERP II – Total quality management – Future Directions – Trends in ERP.

TOTAL : 45 PERIODS
TEXT BOOKS:
1. Alexis Leon, "ERP DEMYSTIFIED", Tata McGraw Hill, Second Edition, 2008.
2. Mary Sumner, "Enterprise Resource Planning", Pearson Education, 2007.

REFERENCES:
1. Jim Mazzullo,"SAP R/3 for Everyone", Pearson,2007.
2. Jose Antonio Fernandz, " The SAP R /3 Handbook", Tata McGraw Hill, 1998.
3. Biao Fu, "SAP BW: A Step-by-Step Guide", First Edition, Pearson Education, 200UNIT III

IT2042	INFORMATION SECURITY	L T P C
		3 0 0 3

AIM:
To study the critical need for ensuring Information Security in Organizations

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

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.

IT2032	SOFTWARE TESTING	L T P C
		3 0 0 3

UNIT I   INTRODUCTION   9
Testing as an Engineering Activity – Role of Process in Software Quality – Testing as a Process – Basic Definitions – Software Testing Principles – The Tester's Role in a Software Development Organization – Origins of Defects – Defect Classes – The Defect Repository and Test Design – Defect Examples – Developer/Tester Support for Developing a Defect Repository.

UNIT II   TEST CASE DESIGN   9
Introduction to Testing Design Strategies – The Smarter Tester – Test Case Design Strategies – Using Black Box Approach to Test Case Design Random Testing – Requirements based testing – positive and negative testing –– Boundary Value Analysis – decision tables - Equivalence Class Partitioning state-based testing– cause-effect graphing – error guessing - compatibility testing – user documentation testing – domain testing Using White–Box Approach to Test design – Test Adequacy Criteria – static testing vs. structural testing – code functional testing - Coverage and Control Flow Graphs – Covering Code Logic – Paths – Their Role in White–box Based Test Design – code complexity testing – Evaluating Test Adequacy Criteria.

UNIT III   LEVELS OF TESTING   9
The Need for Levels of Testing – Unit Test – Unit Test Planning –Designing the Unit Tests. The Test Harness – Running the Unit tests and Recording results – Integration tests – Designing Integration Tests – Integration Test Planning – scenario testing – defect bash elimination -System Testing – types of system testing - Acceptance testing – performance testing - Regression Testing – internationalization testing – ad-hoc testing - Alpha – Beta Tests – testing OO systems – usability and accessibility testing

UNIT IV   TEST MANAGEMENT   9
People and organizational issues in testing – organization structures for testing teams – testing services - Test Planning – Test Plan Components – Test Plan Attachments – Locating Test Items – test management – test process - Reporting Test Results – The role of three groups in Test Planning and Policy Development – Introducing the test specialist – Skills needed by a test specialist – Building a Testing Group.

UNIT V   CONTROLLING AND MONITORING   9
Software test automation – skills needed for automation – scope of automation – design and architecture for automation – requirements for a test tool – challenges in automation - Test metrics and measurements –project, progress and productivity metrics – Status Meetings – Reports and Control Issues – Criteria for Test Completion – SCM – Types of reviews – Developing a review program – Components of Review Plans– Reporting Review Results. – evaluating software quality – defect prevention – testing maturity model

TOTAL : 45 PERIODS

TEXT BOOKS:

1. Ilene Burnstein "Practical Software Testing" Springer International Edition Chennai, 2003
2. Srinivasan Desikan and Gopalaswamy Ramesh, " Software Testing – Principles and Practices", Pearson education, 2006..
3. Aditya P.Mathur, "Foundations of Software Testing", Pearson Education,2008.

REFERENCES:

1. Boris Beizer, "Software Testing Techniques", Second Edition,Dreamtech, 200UNIT III
2. Elfriede Dustin, "Effective Software Testing", First Edition, Pearson Education, 200 UNIT III
3. Renu Rajani, Pradeep Oak, "Software Testing – Effective Methods, Tools and Techniques", Tata McGraw Hill, 2004.

IT2033   BIOINFORMATICS   L T P C
                                                                  3 0 0 3

UNIT I   **9**
Introduction to molecular biology – the genetic material – gene structure – protein structure – chemical bonds – molecular biology tools – genomic information content

UNIT II   **9**
Data searches – simple alignments – gaps – scoring matrices – dynamic programming – global and local alignments – database searches – multiple sequence alignments Patterns for substitutions – estimating substitution numbers – evolutionary rates – molecular clocks – evolution in organelles

UNIT III   **9**
Phylogenetics – history and advantages – phylogenetic trees – distance matrix methods – maximum likelihood approaches – multiple sequence alignments – Parsimony – ancestral sequences – strategies for faster searches – consensus trees – tree confidence – comparison of phylogenetic methods – molecular phylogenies

UNIT IV   **9**
Genomics – prokaryotic genomes: prokaryotic gene structure – GC content - gene density – eukaryotic genomes: gene structure – open reading frames – GC content – gene expression – transposition – repeated elements – gene density

UNIT V   **9**
Amino acids – polypeptide composition – secondary structure – tertiary and quaternary structure – algorithms for modeling protein folding – structure prediction – predicting RNA secondary structures
Proteomics – protein classification – experimental techniques – inhibitors and drug design – ligand screening – NMR structures – empirical methods and prediction techniques – post-translational modification prediction

                                                          TOTAL: 45 PERIODS
TEXT BOOK:
1. D. E. Krane and M. L. Raymer, "Fundamental concepts of Bioinformatics", Pearson Education, 200UNIT III

REFERENCES:
1. Arthur M. Lesk, "Introduction to Bioinformatics", Second Edition, Oxford University Press, 2005.
2. T. K. Attwood, D. J. Parry-Smith, and S. Phukan, "Introduction to Bioinformatics", Pearson Education, 1999.
3. Vittal R. Srinivas, "Bioinformatics – A Modern Approach", Prentice-Hall of India Pvt. Ltd., 2005.

IT2034	ADHOC SENSOR NETWORKS	L T P C
		3 0 0 3

UNIT I   ROUTING   9
Cellular and Ad hoc wireless networks – Issues of MAC layer and Routing – Proactive, Reactive and Hybrid Routing protocols – Multicast Routing – Tree based and Mesh based protocols – Multicast with Quality of Service Provision.

UNIT II   QUALITY OF SERVICE   9
Real-time traffic support – Issues and challenges in providing QoS – Classification of QoS Solutions – MAC layer classifications – QoS Aware Routing Protocols – Ticket based and Predictive location based Qos Routing Protocols

UNIT III   ENERGY MANAGEMENT AD HOC NETWORKS   9
Need for Energy Management – Classification of Energy Management Schemes – Battery Management and Transmission Power Management Schemes – Network Layer and Data Link Layer Solutions – System power Management schemes

UNIT IV   MESH NETWORKS   9
Necessity for Mesh Networks – MAC enhancements – IEEE 802.11s Architecture – Opportunistic Routing – Self Configuration and Auto Configuration - Capacity Models – Fairness – Heterogeneous Mesh Networks – Vehicular Mesh Networks

UNIT V   SENSOR NETWORKS   9
Introduction – Sensor Network architecture – Data Dissemination – Data Gathering – MAC Protocols for sensor Networks – Location discovery – Quality of Sensor Networks – Evolving Standards – Other Issues – Recent trends in Infrastructure less Networks

TOTAL : 45 PERIODS

TEXT BOOK:
1. C. Siva Ram Murthy and B.S.Manoj, "Ad hoc Wireless Networks – Architectures and Protocols', Pearson Education, 2004

REFERENCES
1. Feng Zhao and Leonidas Guibas, "Wireless Sensor Networks", Morgan Kaufman Publishers, 2004.
2. C.K.Toh, "Adhoc Mobile Wireless Networks", Pearson Education, 2002.
3. Thomas Krag and Sebastin Buettrich, 'Wireless Mesh Networking', O'Reilly Publishers, 2007.

IT2043   **KNOWLEDGE MANAGEMENT**   **L T P C**
                                                                     3 0 0 3

UNIT I   KNOWLEDGE MANAGEMENT   9
KM Myths – KM Life Cycle – Understanding Knowledge – Knowledge, intelligence – Experience – Common Sense – Cognition and KM – Types of Knowledge – Expert Knowledge – Human Thinking and Learning.

UNIT II   KNOWLEDGE MANAGEMENT SYSTEM LIFE CYCLE   9
Challenges in Building KM Systems – Conventional Vrs KM System Life Cycle (KMSLS) – Knowledge Creation and Knowledge Architecture – Nonaka's Model of Knowledge Creation and Transformation. Knowledge Architecture.

UNIT III   CAPTURING KNOWLEDGE   9
Evaluating the Expert – Developing a Relationship with Experts – Fuzzy Reasoning and the Quality of Knowledge – Knowledge Capturing Techniques, Brain Storming – Protocol Analysis – Consensus Decision Making – Repertory Grid- Concept Mapping – Blackboarding.

UNIT IV   KNOWLEDGE CODIFICATION   9
Modes of Knowledge Conversion – Codification Tools and Procedures – Knowledge Developer's Skill Sets – System Testing and Deployment – Knowledge Testing – Approaches to Logical Testing, User Acceptance Testing – KM System Deployment Issues – User Training – Post implementation.

UNIT V   KNOWLEDGE TRANSFER AND SHARING   9
Transfer Methods – Role of the Internet – Knowledge Transfer in e-world – KM System Tools – Neural Network – Association Rules – Classification Trees – Data Mining and Business Intelligence – Decision Making Architecture – Data Management – Knowledge Management Protocols – Managing Knowledge Workers.

                                                          TOTAL: 45 PERIODS
TEXT BOOK
1. Elias.M. Award & Hassan M. Ghaziri – "Knowledge Management" Pearson Education 200UNIT III

REFERENCES:

1. Guus Schreiber, Hans Akkermans, Anjo Anjewierden, Robert de Hoog, Nigel Shadbolt, Walter Van de Velde and Bob Wielinga, "Knowledge Engineering and Management", Universities Press, 2001.
2. C.W. Holsapple, "Handbooks on Knowledge Management", International Handbooks on Information Systems, Vol 1 and 2, 2003

CS2063   **GRID COMPUTING**   **L T P C**
                                                              3 0 0 3

UNIT I   CONCEPTS AND ARCHITECTURE   9
Introduction-Parallel and Distributed Computing-Cluster Computing-Grid Computing-Anatomy and Physiology of Grid-Review of Web Services-OGSA-WSRF.

UNIT II   GRID MONITORING   9
Grid Monitoring Architecture (GMA) - An Overview of Grid Monitoring Systems- GridICE – JAMM -MDS-Network Weather Service-R-GMA-Other Monitoring Systems- Ganglia and GridMon

UNIT III   GRID SECURITY AND RESOURCE MANAGEMENT   9
Grid Security-A Brief Security Primer-PKI-X509 Certificates-Grid Security-Grid Scheduling and Resource Management-Scheduling Paradigms- Working principles of Scheduling -A Review of Condor, SGE, PBS and LSF-Grid Scheduling with QoS.

UNIT IV   DATA MANAGEMENT AND GRID PORTALS   9
Data Management-Categories and Origins of Structured Data-Data Management Challenges-Architectural Approaches-Collective Data Management Services-Federation Services-Grid Portals-First-Generation Grid Portals-Second-Generation Grid Portals.

UNIT V   GRID MIDDLEWARE   9
List of globally available Middlewares - Case Studies-Recent version of Globus Toolkit and gLite - Architecture, Components and Features.

TEXT BOOK:
1. Maozhen Li, Mark Baker, The Grid Core Technologies, John Wiley & Sons ,2005.

REFERENCES:
1. Ian Foster & Carl Kesselman, The Grid 2 – Blueprint for a New Computing Infrastructure ,   Morgan Kaufman – 2004.
2. Joshy Joseph & Craig Fellenstein, "Grid Computing", Pearson Education 2004.
3. Fran Berman, Geoffrey Fox, Anthony J.G. Hey, "Grid Computing: Making the Global Infrastructure a reality", John Wiley and sons, 200UNIT III

CS2041   **C# AND .NET FRAMEWORK**   **L T P C**
                                                              3 0 0 3

UNIT I   9
Review of OOP Concepts - Overview of .NET Framework - Basic Elements of C# - Program Structure and simple Input and Output Operations – Operators and Expressions – Statements – Arrays and Structures.

UNIT II   9
Inheritance - Namespace – Polymorphism – Interface and Overloading – Multiple Inheritance – Property – Indexes – Delegates – Publish/Subscribe Design Patterns-Operator Overloading-Method Overloading

UNIT II 9

C# Concepts for creating Data Structures - File Operation – File Management systems – Stream Oriented Operations- Multitasking – Multithreading – Thread Operation – Synchronization.

UNIT IV 9

Working with XML – Techniques for Reading and Writing XML Data - Using XPath and Search XML - ADO.NET Architecture – ADO.NET Connected and Disconnected Models – XML and ADO.NET – Simple and Complex Data Binding– Data Grid View Class.

UNIT V 9

Application Domains – Remoting – Leasing and Sponsorship - .NET Coding Design Guidelines –Assemblies – Security – Application Development – Web Services - Building an XML Web Service - Web Service Client – WSDL and SOAP – Web Service with Complex Data Types – Web Service Performance.

TOTAL : 45 PERIODS

TEXT BOOKS
1. S. Thamarai Selvi and R. Murugesan "A Textbook on C# ", Pearson Education,200UNIT III
2. Stephen C. Perry " Core C# and .NET", Pearson Education,2006.

REFERENCES
1. Jesse Liberty, "Programming C#", Second Edition, O'Reilly Press, 2002.
2. Robinson et al, "Professional C#", Fifth Edition, Wrox Press, 2002.
3. Herbert Schildt, "The Complete Reference: C#", Tata McGraw Hill, 2004.
4. Andrew Troelsen, "C# and the .NET Platform", A! Press, 200UNIT III
5. Thaana Thai and Hoang Q. Lam, ". NET Framework Essentials", Second Edition, O'Reilly, 2002.

IT2050 **PRINCIPLES OF COMPILER DESIGN** **L T P C**
3 0 0 3

UNIT I **BASICS OF COMPILATION** 9

Compilers – Analysis of source program – Phases of a compiler – Grouping of phases – Compiler Construction tools – Lexical Analyzer: Token specification -Token Recognition- A language for Specifying lexical analyzer– Top down parser : Table implementation of Predictive Parser - Bottom-up Parser : SLR(1) Parser - Parser generators.

UNIT II **TYPE CHECKING AND RUNTIME ENVIRONMENTS** 9

Syntax directed definitions – Construction of syntax trees – Type systems – Specification of a simple type checker - Equivalence of type expressions – Type conversions – Attribute grammar for a simple type checking system – Runtime Environments: Source language issues – Storage organization – Storage allocation strategies – Parameter passing.

UNIT III INTERMEDIATE CODE GENERATION 9
Intermediate languages – Declarations – Assignment statements – Boolean expressions – Case statements – Backpatching – Procedure calls.

UNIT IV CODE GENERATION 9
Issues in the design of a code generator – The target machine – Runtime storage management – Basic blocks and flow graphs – Next-use information – A simple code generator – Register allocation and assignment – The DAG representation of basic blocks – Generating code from DAG – Dynamic programming code generation algorithm – Code-generator generators.

UNIT V CODE OPTIMIZATION 9
Principal sources of optimization – Peephole optimization – Optimization of basic blocks – Loops in flow graphs – Introduction to global data flow analysis – Iterative solution of data flow equations – Code improving transformations – Dealing with aliases.

TOTAL: 45 PERIODS

TEXT BOOK:
1. Alfred V. Aho, Ravi Sethi, Jeffrey D. Ullman. "Compilers Principles, Techniques and Tools". Pearson Education, 2008.

REFERENCES:
1. Steven S. Muchnick, "Advanced Compiler Design Implementation", Morgan Koffman, 1997.
2. Charles N. Fischer, Richard J. Leblanc, "Crafting a Compiler with C", Benjamin Cummings, 1991.
3. Allen Holub, "Compiler Design in C", Prentice Hall of India, 1990.

IT2051 **KNOWLEDGE ENGINEERING** **L T P C**
3 0 0 3

UNIT I INTRODUCTION 9
Key concepts – Why knowledge Representation and Reasoning – Language of first order Logic – Syntax, Semantics Pragmatics – Expressing Knowledge – Levels of Representation – Knowledge Acquisition and Sharing – Sharing Ontologies – Language Ontologies –Language Patterns – Tools for Knowledge Acquisition

UNIT II RESOLUTION AND REASONING 9
Proportional Case – Handling Variables and Qualifies – Dealing with Intractability – Reasoning with Horn Clauses - Procedural Control of Reasoning – Rules in Production – Description Logic - Vivid Knowledge – Beyond Vivid.

UNIT III REPRESENTATION 9
Object Oriented Representations – Frame Formalism – Structured Descriptions – Meaning and Entailment - Taxonomies and Classification – Inheritance – Networks – Strategies for Defeasible Inheritance – Formal Account of Inheritance Networks.

UNIT IV   DEFAULTS, UNCERTAINTY AND EXPRESSIVENESS   9

Defaults – Introduction – Closed World Reasoning – Circumscription – Default Logic Limitations of Logic – Fuzzy Logic – Nonmontonic Logic – Theories and World – Semiotics – Auto epistemic Logic - Vagueness – Uncertainty and Degrees of Belief – Noncategorical Reasoning – Objective and Subjective Probability.

UNIT V   ACTIONS AND PLANNING   9

Explanation and Diagnosis – Purpose – Syntax, Semantics of Context – First Order Reasoning – Modal Reasoning in Context – Encapsulating Objects in Context – Agents – Actions – Situational Calculus – Frame Problem – Complex Actions – Planning – Strips – Planning as Reasoning – Hierarchical and Conditional Planning.

TOTAL: 45 PERIODS

TEXT BOOK:

1. Ronald Brachman, Hector Levesque "Knowledge Representation and Reasoning ", the Morgan Kaufmann Series in Artificial Intelligence 2004

REFERENCES:

1. John F. Sowa, " Knowledge Representation: Logical, Philosophical, and Computational Foundations", 2000
2. Arthur B. Markman, "Knowledge Representation", Lawrence Erlbaum Associates,1998

GE2022   TOTAL QUALITY MANAGEMENT   L T P C
**   3 0 0 3**

UNIT I   INTRODUCTION   9

Introduction - Need for quality - Evolution of quality - Definition of quality - Dimensions of manufacturing and service quality - Basic concepts of TQM - Definition of TQM – TQM Framework - Contributions of Deming, Juran and Crosby – Barriers to TQM.

UNIT II   TQM PRINCIPLES   9

Leadership – Strategic quality planning, Quality statements - Customer focus – Customer orientation, Customer satisfaction, Customer complaints, Customer retention - Employee involvement – Motivation, Empowerment, Team and Teamwork, Recognition and Reward, Performance appraisal - Continuous process improvement – PDSA cycle, 5s, Kaizen - Supplier partnership – Partnering, Supplier selection, Supplier Rating.

UNIT III   TQM TOOLS & TECHNIQUES I   9

The seven traditional tools of quality – New management tools – Six-sigma: Concepts, methodology, applications to manufacturing, service sector including IT – Bench marking – Reason to bench mark, Bench marking process – FMEA – Stages, Types.

UNIT IV   TQM TOOLS & TECHNIQUES II   9

Quality circles – Quality Function Deployment (QFD) – Taguchi quality loss function – TPM – Concepts, improvement needs – Cost of Quality – Performance measures.

UNIT V   QUALITY SYSTEMS   9
Need for ISO 9000- ISO 9000-2000 Quality System – Elements, Documentation, Quality auditing- QS 9000 – ISO 14000 – Concepts, Requirements and Benefits – Case studies of TQM implementation in manufacturing and service sectors including IT.

TOTAL: 45 PERIODS

TEXT BOOK:
1. Dale H.Besterfiled, et at., "Total Quality Management", Pearson Education Asia,3rd Edition, Indian Reprint (2006).

REFERENCES:
1. James R. Evans and William M. Lindsay, "The Management and Control of Quality", 6th Edition, South-Western (Thomson Learning), 2005.
2. Oakland, J.S., "TQM – Text with Cases", Butterworth – Heinemann Ltd., Oxford, 3rd Edition, 200UNIT III
3.   Suganthi,L and Anand Samuel, "Total Quality Management", Prentice Hall (India) Pvt. Ltd.,2006.
4. Janakiraman, B and Gopal, R.K, "Total Quality Management – Text and Cases", Prentice Hall (India) Pvt. Ltd., 2006.

**GE2072   INDIAN CONSTITUTION AND SOCIETY   L T P C
                                                          3 0 0 3**

UNIT I   9
Historical Background – Constituent Assembly of India – Philosophical foundations of the Indian Constitution – Preamble – Fundamental Rights – Directive Principles of State Policy – Fundamental Duties – Citizenship – Constitutional Remedies for citizens.

UNIT II   9
Union Government – Structures of the Union Government and Functions – President – Vice President – Prime Minister – Cabinet – Parliament – Supreme Court of India – Judicial Review.

UNIT III   9
State Government – Structure and Functions – Governor – Chief Minister – Cabinet – State Legislature – Judicial System in States – High Courts and other Subordinate Courts.

UNIT IV   9
Indian Federal System – Center – State Relations – President's Rule – Constitutional Amendments – Constitutional Functionaries - Assessment of working of the Parliamentary System in India.

UNIT V   9
Society : Nature, Meaning and definition; Indian Social Structure; Caste, Religion, Language in India; Constitutional Remedies for citizens – Political Parties and Pressure Groups; Right of Women, Children and Scheduled Castes and Scheduled Tribes and other Weaker Sections.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Durga Das Basu, "Introduction to the Constitution of India ", Prentice Hall of India, New Delhi.
2. R.C.Agarwal, (1997) "Indian Political System", S.Chand and Company, New Delhi.
3. Maciver and Page, " Society: An Introduction Analysis ", Mac Milan India Ltd., New Delhi.
4. K.L.Sharma, (1997) "Social Stratification in India: Issues and Themes", Jawaharlal Nehru University, New Delhi.

REFERENCES:

1. Sharma, Brij Kishore, "Introduction to the Constitution of India:, Prentice Hall of India, New Delhi.
2. U.R.Gahai, "Indian Political System ", New Academic Publishing House, Jalaendhar.
3. R.N. Sharma, "Indian Social Problems ", Media Promoters and Publishers Pvt. Ltd.

GE2025   PROFESSIONAL ETHICS IN ENGINEERING   L T P C
                                                                                          3 0 0 3

UNIT I   ENGINEERING ETHICS   9

Senses of 'Engineering Ethics' – Variety of moral issues – Types of inquiry – Moral dilemmas – Moral Autonomy – Kohlberg's theory – Gilligan's theory – Consensus and Controversy – Professions and Professionalism – Professional Ideals and Virtues – Uses of Ethical Theories

UNIT II   ENGINEERING AS SOCIAL EXPERIMENTATION   9

Engineering as Experimentation – Engineers as responsible Experimenters – Research Ethics - Codes of Ethics – Industrial Standards - A Balanced Outlook on Law – The Challenger Case Study

UNIT III   ENGINEER'S RESPONSIBILITY FOR SAFETY   9

Safety and Risk – Assessment of Safety and Risk – Risk Benefit Analysis – Reducing Risk – The Government Regulator's Approach to Risk - Chernobyl Case Studies and Bhopal

UNIT IV   RESPONSIBILITIES AND RIGHTS   9

Collegiality and Loyalty – Respect for Authority – Collective Bargaining – Confidentiality – Conflicts of Interest – Occupational Crime – Professional Rights – Employee Rights – Intellectual Property Rights (IPR) - Discrimination

UNIT V   GLOBAL ISSUES   9

Multinational Corporations – Business Ethics - Environmental Ethics – Computer Ethics - Role in Technological Development – Weapons Development – Engineers as Managers – Consulting Engineers – Engineers as Expert Witnesses and Advisors – Honesty – Moral Leadership – Sample Code of Conduct

TOTAL: 45 PERIODS

TEXT BOOKS:
1. Mike Martin and Roland Schinzinger, "Ethics in Engineering", McGraw Hill, New York, 2005.
2. Charles E Harris, Michael S Pritchard and Michael J Rabins, "Engineering Ethics – Concepts and Cases", Thompson Learning, 2000.

REFERENCES:

1. Charles D Fleddermann, "Engineering Ethics", Prentice Hall, New Mexico, 1999.
2. John R Boatright, "Ethics and the Conduct of Business", Pearson Education, 2003
3. Edmund G Seebauer and Robert L Barry, "Fundamentals of Ethics for Scientists and Engineers", Oxford University Press, 2001.
4. Prof. (Col) P S Bajaj and Dr. Raj Agrawal, "Business Ethics – An Indian Perspective", Biztantra, New Delhi, 2004.
5. David Ermann and Michele S Shauf, "Computers, Ethics and Society", Oxford University Press, (2003)

GE2071	**INTELLECTUAL PROPERTY RIGHTS (IPR)**	**L T P C**
		3 0 0 3

UNIT I   **5**
Introduction – Invention and Creativity – Intellectual Property (IP) – Importance – Protection of IPR – Basic types of property (i). Movable Property ii. Immovable Property and iii. Intellectual Property.

UNIT II   **10**
IP – Patents – Copyrights and related rights – Trade Marks and rights arising from Trademark registration – Definitions – Industrial Designs and Integrated circuits – Protection of Geographical Indications at national and International levels – Application Procedures..

UNIT III   **10**
International convention relating to Intellectual Property – Establishment of WIPO – Mission and Activities – History – General Agreement on Trade and Tariff (GATT).

UNIT IV   **10**
Indian Position Vs WTO and Strategies – Indian IPR legislations – commitments to WTO-Patent Ordinance and the Bill – Draft of a national Intellectual Property Policy – Present against unfair competition.

UNIT V   **10**
Case Studies on – Patents (Basumati rice, turmeric, Neem, etc.) – Copyright and related rights – Trade Marks – Industrial design and Integrated circuits – Geographic indications – Protection against unfair competition.

TOTAL: 45 PERIODS

TEXT BOOK:
1. Subbaram N.R. "Handbook of Indian Patent Law and Practice ", S. Viswanathan Printers and Publishers Pvt. Ltd., 1998.

REFERENCES:
1. Eli Whitney, United States Patent Number: 72X, Cotton Gin, March 14, 1794.
2. Intellectual Property Today: Volume 8, No. 5, May 2001, [www.iptoday.com].
3. Using the Internet for non-patent prior art searches, Derwent IP Matters, July 2000. www.ipmatters.net/features/000707_gibbs.html.

IT2052   **MANAGEMENT INFORMATION SYSTEMS**   **L T P C**
                                                                                                3 0 0 3

UNIT I   INFORMATION SYSTEM AND ORGANIZATION   9
Matching the Information System Plan to the Organizational Strategic Plan – Identifying Key Organizational Objective and Processes and Developing an Information System Development – User role in Systems Development Process – Maintainability and Recoverability in System Design.

UNIT II   REPRESENTATION AND ANALYSIS OF SYSTEM STRUCTURE   9
Models for Representing Systems: Mathematical, Graphical and Hierarchical (Organization Chart, Tree Diagram) – Information Flow – Process Flow – Methods and Heuristics – Decomposition and Aggregation – Information Architecture – Application of System Representation to Case Studies.

UNIT III   SYSTEMS, INFORMATION AND DECISION THEORY   9
Information Theory – Information Content and Redundancy – Classification and Compression – Summarizing and Filtering – Inferences and Uncertainty – Identifying Information needed to Support Decision Making – Human Factors – Problem characteristics and Information System Capabilities in Decision Making.

UNIT IV   INFORMATION SYSTEM APPLICATION   9
Transaction Processing Applications – Basic Accounting Application – Applications for Budgeting and Planning – Other use of Information Technology: Automation – Word Processing – Electronic Mail – Evaluation Remote Conferencing and Graphics – System and Selection – Cost Benefit – Centralized versus Decentralized Allocation Mechanism.

UNIT V   DEVELOPMENT AND MAINTENANCE OF INFORMATION SYSTEMS 9
Systems analysis and design – System development life cycle – Limitation – End User Development – Managing End Users – off– the shelf software packages – Outsourcing – Comparison of different methodologies.

TOTAL: 45 PERIODS

TEXT BOOK
1. Laudon K.C, Laudon J.P, Brabston M.E, "Management Information Systems - Managing the digital firm", Pearon Education, 2004.

REFERENCES
1. Turban E.F, Potter R.E, "Introduction to Information Technology";
    Wiley, 2 004.
2. Jeffrey A.Hoffer, Joey F.George, Joseph S. Valachich, "Modern Systems Analysis
    and Design", Third Edition, Prentice Hall, 2002.

IT2061   **SYSTEM MODELING AND SIMULATION**   **L T P C**
                                                              3 0 0 3

UNIT I   INTRODUCTION TO SIMULATION   9

Introduction – Simulation Terminologies- Application areas – Model Classification –
Types of Simulation- Steps in a Simulation study- Concepts in Discrete Event Simulation
- Simulation Examples

UNIT II   MATHEMATICAL MODELS   9

Statistical Models - Concepts – Discrete Distribution- Continuous Distribution – Poisson
Process- Empirical Distributions- Queueing Models – Characteristics- Notation –
Queueing Systems – Markovian Models- Properties of random numbers- Generation of
Pseudo Random numbers- Techniques for generating random numbers-Testing random
number generators- Generating Random-Variates- Inverse Transform technique –
Acceptance- Rejection technique – Composition & Convolution Method.

UNIT III   ANALYSIS OF SIMULATION DATA   9

Input Modeling - Data collection - Assessing sample independence - Hypothesizing
distribution family with data - Parameter Estimation - Goodness-of-fit tests - Selecting
input models in absence of data- Output analysis for a Single system – Terminating
Simulations – Steady state simulations.

UNIT IV   VERIFICATION AND VALIDATION   9

Model Building – Verification of Simulation Models – Calibration and Validation of
Models – Validation of Model Assumptions – Validating Input – Output Transformations.

UNIT V   SIMULATION OF COMPUTER SYSTEMS AND CASE STUDIES   9

Simulation Tools – Model Input – High level computer system simulation – CPU –
Memory Simulation – Comparison of systems via simulation – Simulation Programming
techniques - Development of Simulation models.

TEXT BOOKS:
1. Jerry Banks and John Carson, " Discrete Event System Simulation", Fourth Edition,
    PHI, 2005.
2. Geoffrey Gordon, "System Simulation", Second Edition, PHI, 2006 (Unit – V).

REFERENCES:
1. Frank L. Severance, " System Modeling and Simulation", Wiley, 2001.
2. Averill M. Law and W.David Kelton, " Simulation Modeling and Analysis, Third
    Edition, McGraw Hill, 2006.
3. Jerry Banks, "Handbook of Simulation: Principles, Methodology, Advances,
    Applications and Practice", Wiley, 1998.

CS2035   **NATURAL LANGUAGE PROCESSING**   **L T P C**
                                                                3 0 0 3

UNIT I   **9**
Introduction – Models -and Algorithms - The Turing Test -Regular Expressions Basic Regular Expression Patterns -Finite State Automata -Regular Languages and FSAs – Morphology -Inflectional Morphology - Derivational Morphology -Finite-State Morphological Parsing - Combining an FST Lexicon and Rules -Porter Stemmer

UNIT II   **9**
N-grams Models of Syntax - Counting Words - Unsmoothed N-grams – Smoothing-Backoff - Deleted Interpolation – Entropy - English Word Classes - Tagsets for English - Part of Speech Tagging -Rule-Based Part of Speech Tagging - Stochastic Part of Speech Tagging - Transformation-Based Tagging -

UNIT III   **9**
Context Free Grammars for English Syntax- Context-Free Rules and Trees - Sentence-Level Constructions –Agreement – Sub Categorization – Parsing – Top-down – Earley Parsing -Feature Structures - Probabilistic Context-Free Grammars

UNIT IV   **9**
Representing Meaning - Meaning Structure of Language - First Order Predicate Calculus - Representing Linguistically Relevant Concepts -Syntax-Driven Semantic Analysis - Semantic Attachments - Syntax-Driven Analyzer - Robust Analysis - Lexemes and Their Senses - Internal Structure - Word Sense Disambiguation -Information Retrieval

UNIT V   **9**
Discourse -Reference Resolution - Text Coherence -Discourse Structure - Dialog and Conversational Agents - Dialog Acts – Interpretation – Coherence -Conversational Agents - Language Generation – Architecture -Surface Realizations - Discourse Planning – Machine Translation -Transfer Metaphor – Interlingua – Statistical Approaches

                                                        TOTAL: 45 PERIODS
TEXT BOOKS
1. D. Jurafsky and J. Martin "Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics, and Speech Recognition",
2. C. Manning and H. Schutze, "Foundations of Statistical Natural Language Processing",

REFERENCE
1. James Allen. "Natural Language Understanding", Addison Wesley, 1994.

IT2053   **SOFTWARE DESIGN**   **L T P C**
                                                                3 0 0 3

UNIT I   GENERAL DESIGN FUNDAMENTALS   **9**
The nature of Design process – Objectives – Building Models – Constructs, Design qualities – Assessing the design – Design viewpoints for software – The object Model – Classes and Objects – Complexity – Classification – Notation – Process – Pragmatics.

UNIT II   STRUCTURED SYSTEM ANALYSIS AND DESIGN   9

Structured Design – Design Principles – Problem Partitioning and Hierarchy – Abstraction, Modularity – Top-down and Bottom-up Strategies – Transformation of a DFD to a Structure Chart – Transform Analysis – Transaction Analysis – Coupling – Cohesion – Multiple types of Cohesion in a module – Data Design – Normalization – Denormalization – Procedural Design.

UNIT III   OBJECT ORIENTED ANALYSIS AND DESIGN   9

Overview of Object Oriented Analysis – Shaler/Mellor – Coad/ Yourdon – Rumbaugh – Booch – UML – Use case – Conceptual model – Behaviour – Class Analysis Patterns – Overview – Diagrams – Aggregation – UML – Diagrams – Collaboration – Sequence – Class – Design patterns and Frameworks – Comparison with other design methods – Managing analysis and design – Evaluation testing – Coding – Maintenance – Metrics.

UNIT IV   SOFTWARE DESIGN   9

The Architecture Concepts – Design Methods – Design Patterns – Rationale for Methods – Design Processes and Strategies – Design by Template – Designing with Patterns – Stepwise Refinement – Incremental Design – Prototyping – DSDM – Structured Systems Analysis and Structured Design – JSP – JSD.

UNIT V   CASE STUDIES   9

Domain Name System – Email – World Wide Web (HTTP) – Simple Network Management Protocol – File Transfer Protocol – Security – Mutimedia applications.

TOTAL: 45 PERIODS

REFERENCES

1. David Budgen, "Software Design", Second Edition, Pearson Education, 2004.
2. R. S. Pressman, "Software Engineering", Fifth Edition, McGraw Hill Inc., 2001.
3. Steve McConnell, "Code Complete ", Word Power Publishers, 2001.
4. Ed Downs, Peter Clare, Jan Coe, "Structured System Analysis and Design Methods Application and Context ", Prentice Hall, 1998.
5. A. G. Suteliffe, "Human Computer Interface Design ", Second Edition Macmillan, 1995.

GE2023   FUNDAMENTALS OF NANOSCIENCE   L T P C
     3 0 0 3

UNIT I   INTRODUCTION   9

Nanoscale Science and Technology- Implications for Physics, Chemistry, Biology and Engineering-Classifications of nanostructured materials- nano particles- quantum dots, nanowires-ultra-thinfilms-multilayered materials. Length Scales involved and effect onproperties: Mechanical, Electronic, Optical, Magnetic and Thermal properties. Introduction to properties and motivation for study (qualitative only).

UNIT II   PREPARATION METHODS   10

Bottom-up Synthesis-Top-down Approach: Precipitation, Mechanical Milling, Colloidal routes, Self-assembly, Vapour phase deposition, MOCVD, Sputtering, Evaporation, Molecular Beam Epitaxy, Atomic Layer Epitaxy, MOMBE.

UNIT III   PATTERNING AND LITHOGRAPHY FOR NANOSCALE DEVICES   7

Introduction to optical/UV electron beam and X-ray Lithography systems and processes, Wet etching, dry (Plasma /reactive ion) etching, Etch resists-dip pen lithography

UNIT IV   PREPARATION ENVIRONMENTS   9

Clean rooms: specifications and design, air and water purity, requirements for particular processes, Vibration free environments: Services and facilities required. Working practices, sample cleaning, Chemical purification, chemical and biological contamination, Safety issues, flammable and toxic hazards, biohazards.

UNIT V   CHARECTERISATION TECHNIQUES   10

X-ray diffraction technique, Scanning Electron Microscopy - environmental techniques, Transmission Electron Microscopy including high-resolution imaging, Surface Analysis techniques- AFM, SPM, STM, SNOM, ESCA, SIMS-Nanoindentation

TOTAL : 45 PERIODS

TEXT BOOKS:
1. A.S. Edelstein and R.C. Cammearata, eds., Nanomaterials: Synthesis, Properties and Applications, (Institute of Physics Publishing, Bristol and Philadelphia, 1996)
2. N John Dinardo, Nanoscale charecterisation of surfaces & Interfaces, Second edition, Weinheim Cambridge, Wiley-VCH, 2000 45

REFERENCES:
1. G Timp (Editor), Nanotechnology, AIP press/Springer, 1999
2. Akhlesh Lakhtakia (Editor) The Hand Book of Nano Technology, "Nanometer Structure", Theory, Modeling and Simulations. Prentice-Hall of India (P) Ltd, New Delhi, 2007.

CS2053   **SOFT COMPUTING**   **L T P C**
                                                                   3 0 0 3

UNIT I   FUZZY SET THEORY   10

Introduction to Neuro – Fuzzy and Soft Computing – Fuzzy Sets – Basic Definition and Terminology – Set-theoretic Operations – Member Function Formulation and Parameterization – Fuzzy Rules and Fuzzy Reasoning – Extension Principle and Fuzzy Relations – Fuzzy If-Then Rules – Fuzzy Reasoning – Fuzzy Inference Systems – Mamdani Fuzzy Models – Sugeno Fuzzy Models – Tsukamoto Fuzzy Models – Input Space Partitioning and Fuzzy Modeling.

UNIT II   OPTIMIZATION   8

Derivative-based Optimization – Descent Methods – The Method of Steepest Descent – Classical Newton's Method – Step Size Determination – Derivative-free Optimization – Genetic Algorithms – Simulated Annealing – Random Search – Downhill Simplex Search.

UNIT III   ARTIFICIAL INTELLIGENCE   10

Introduction, Knowledge Representation – Reasoning, Issues and Acquisition: Prepositional and Predicate Calculus Rule Based knowledge Representation Symbolic Reasoning Under Uncertainity Basic knowledge Representation Issues Knowledge acquisition – Heuristic Search: Techniques for Heuristic search Heuristic Classification - State Space Search: Strategies Implementation of Graph Search Search based on Recursion Patent-directed Search Production System and Learning.

UNIT IV   NEURO FUZZY MODELING   9

Adaptive Neuro-Fuzzy Inference Systems – Architecture – Hybrid Learning Algorithm – Learning Methods that Cross-fertilize ANFIS and RBFN – Coactive Neuro Fuzzy Modeling – Framework Neuron Functions for Adaptive Networks – Neuro Fuzzy Spectrum.

UNIT V   APPLICATIONS OF COMPUTATIONAL INTELLIGENCE   8

Printed Character Recognition – Inverse Kinematics Problems – Automobile Fuel Efficiency Prediction – Soft Computing for Color Recipe Prediction.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. J.S.R.Jang, C.T.Sun and E.Mizutani, "Neuro-Fuzzy and Soft Computing", PHI, 2004, Pearson Education 2004.
2. N.P.Padhy, "Artificial Intelligence and Intelligent Systems", Oxford University Press, 2006.

REFERENCES:

1. Elaine Rich & Kevin Knight, Artificial Intelligence, Second Edition, Tata Mcgraw Hill Publishing Comp., 2006, New Delhi.
2. Timothy J.Ross, "Fuzzy Logic with Engineering Applications", McGraw-Hill, 1997.
3. Davis E.Goldberg, "Genetic Algorithms: Search, Optimization and Machine Learning", Addison Wesley, N.Y., 1989.
4. S. Rajasekaran and G.A.V.Pai, "Neural Networks, Fuzzy Logic and Genetic Algorithms", PHI, 200UNIT III
5. R.Eberhart, P.Simpson and R.Dobbins, "Computational Intelligence - PC Tools", AP Professional, Boston, 1996.
6. Amit Konar, "Artificial Intelligence and Soft Computing Behaviour and Cognitive model of the human brain", CRC Press, 2008.

**IT2064   SPEECH PROCESSING   L T P C
                                                    3 0 0 3**

UNIT I   MECHANICS OF SPEECH   9

Speech production: Mechanism of speech production, Acoustic phonetics - Digital models for speech signals - Representations of speech waveform: Sampling speech signals, basics of quantization, delta modulation, and Differential PCM - Auditory perception: psycho acoustics.

UNIT II   TIME DOMAIN METHODS FOR SPEECH PROCESSING   9
Time domain parameters of Speech signal – Methods for extracting the parameters Energy, Average Magnitude, Zero crossing Rate – Silence Discrimination using ZCR and energy – Short Time Auto Correlation Function – Pitch period estimation using Auto Correlation Function.

UNIT III   FREQUENCY DOMAIN METHOD FOR SPEECH PROCESSING   9
Short Time Fourier analysis: Fourier transform and linear filtering interpretations, Sampling rates - Spectrographic displays - Pitch and formant extraction - Analysis by Synthesis - Analysis synthesis systems: Phase vocoder, Channel Vocoder - Homomorphic speech analysis: Cepstral analysis of Speech, Formant and Pitch Estimation, Homomorphic Vocoders.

UNIT IV   LINEAR PREDICTIVE ANALYSIS OF SPEECH   9
Basic Principles of linear predictive analysis – Auto correlation method – Covariance method – Solution of LPC equations – Cholesky method – Durbin's Recursive algorithm – Application of LPC parameters – Pitch detection using LPC parameters – Formant analysis – VELP – CELP.

UNIT V   APPLICATION OF SPEECH & AUDIO SIGNAL PROCESSING   9
Algorithms: Dynamic time warping, K-means clustering and Vector quantization, Gaussian mixture modeling, hidden Markov modeling - Automatic Speech Recognition: Feature Extraction for ASR, Deterministic sequence recognition, Statistical Sequence recognition, Language models - Speaker identification and verification – Voice response system – Speech synthesis: basics of articulatory, source-filter, and concatenative synthesis – VOIP

TOTAL: 45 PERIODS

TEXT BOOKS:
1. L. R. Rabiner and R. W. Schaffer, "Digital Processing of Speech signals", Prentice Hall, 1978.
2. Ben Gold and Nelson Morgan, "Speech and Audio Signal Processing", John Wiley and Sons Inc., Singapore, 2004.

REFERENCES:
 1. Quatieri, "Discrete-time Speech Signal Processing", Prentice Hall, 2001.
2. L.R. Rabiner and B. H. Juang, "Fundamentals of speech recognition", Prentice Hall, 199UNIT III

CS2056   DISTRIBUTED SYSTEMS   L T P C
                                                                      3 0 0 3

UNIT I   9
Characterization of Distributed Systems-Introduction-Examples-Resource Sharing and the Web-Challenges. System Models\-Architectural-Fundamental.
Interprocess Communication-Introduction-API for Internet protocols-External data representation and marshalling--Client-server communication-Group communication-Case study: Interprocess Communication in UNIX.

UNIT II   **9**

Distributed Objects and Remote Invocation-Introduction-Communication between distributed objects-Remote procedure calls-Events and notifications-Case study: Java RMI.

Operating System Support-Introduction-OS layer-Protection-Processes and threads-Communication and invocation OS architecture.

UNIT III   **9**

Distributed File Systems-Introduction-File service architecture-Case Study:Sun Network File System-Enhancements and further developments.

Name Services-Introduction-Name Services and the Domain Name System-Directory Services-Case Study: Global Name Service.

UNIT IV   **9**

Time and Global States-Introduction-Clocks, events and process states-Synchronizing physical clocks-Logical time and logical clocks-Global states-Distributed debugging.

Coordination and Agreement-Introduction-Distributed mutual exclusion-Elections-Multicast communication-Consensus and related problems.

UNIT V   **9**

Distributed Shared Memory-Introduction-Design and implementation issues-Sequential consistency and Ivy case study Release consistency and Munin case study-Other consistency models.

CORBA Case Study- Introduction-CORBA RMI-CORBA services.

                                         TOTAL: 45 PERIODS

TEXT BOOK:

1. George Coulouris, Jean Dollimore, Tim Kindberg, , "Distributed Systems: Concepts and Design", 4th Edition, Pearson Education, 2005.

REFERENCES:

1. A.tS. Tanenbaum and M. V. Steen, "Distributed Systems: Principles and Paradigms", Second Edition, Prentice Hall, 2006.
2. M.L.Liu, "Distributed Computing Principles and Applications", Pearson Addison Wesley, 2004.
3. Mukesh Singhal, "Advanced Concepts In Operating Systems", McGrawHill Series in Computer Science, 1994.
4. Nancy A. Lynch, "Distributed Algorithms", The Morgan Kaufmann Series in Data Management System, Morgan Kaufmann Publishers, 2000.

ANNA UNIVERSITY, CHENNAI

AFFILIATED INSTITUTIONS

R - 2008

I SEMESTER CURRICULA AND SYLLABI

(Common to all B.E. / B.Tech Programmes except B.E. Marine Engineering)

SEMESTER I

SL. No.	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	HS2111	Technical English - I	3	1	0	4
2.	MA2111	Mathematics - I	3	1	0	4
3.	PH2111	Engineering Physics - I	3	0	0	3
4.	CY2111	Engineering Chemistry - I	3	0	0	3
5.	GE2111	Engineering Graphics	2	3	0	5
6.	GE2112	Fundamentals of Computing and Programming	3	0	0	3
PRACTICAL						
7.	GE2115	Computer Practice Laboratory -I	0	0	3	2
8.	GE2116	Engineering Practices Laboratory	0	0	3	2
9.		* Physics & Chemistry Laboratory I	0	0	3	-
				TOTAL : 26 CREDITS		

* **Laboratory classes on alternate weeks for Physics and Chemistry. The lab examinations will be held only in the second semester (Including the first semester experiments also).**

HS2111   **TECHNICAL ENGLISH – I**   **L T P C**
                                                                          3   1 0 4

AIM:

To encourage students to actively involve in participative learning of English and to help them acquire Communication Skills.

OBJECTIVES:

1. To help students develop listening skills for academic and professional purposes.
2. To help students acquire the ability to speak effectively in English in real-life situations.
3. To inculcate reading habit and to develop effective reading skills.
4. To help students improve their active and passive vocabulary.
5. To familiarize students with different rhetorical functions of scientific English.
6. To enable students write letters and reports effectively in formal and business situations.

UNIT I   **12**

General Vocabulary - changing words from one form to another - Adjectives, comparative adjectives – Adverbs - Active and passive voice – Tenses - simple present, present continuous - Adverb forms – Nouns – compound nouns - Skimming and scanning - Listening and transfer of information – bar chart, flowchart - Paragraph writing, description – Discussing as a group and making an oral report on the points discussed, conversation techniques - convincing others.

Suggested activities:

1. Matching words & meanings - Using words in context – Making sentences.
2. Changing sentences from active to passive voice & vice versa.
3. Skimming, cloze exercises, exercises transferring information from text to graphic form – bar charts, flow charts.
4. Writing descriptions using descriptive words & phrases, and technical vocabulary.
5. Role play, conversation exercises, discussions, oral reporting exercises
   Any other related relevant classroom activity.

UNIT II   **12**

Vocabulary – prefixes & suffixes – simple past tense - Spelling and punctuation – 'wh' Question forms - Scanning, inference - Listening & note-taking - Paragraph writing - comparison and contrast - Creative thinking and speaking.

Suggested Activities:

1. a. Vocabulary actiivities using prefixes and suffixes.
   b. Exercises using questions – asking & answering questions.
2. Scanning the text for specific information
3. Listening guided note-taking - Writing paragraphs using notes, giving suitable headings and subheadings for paragraphs. Using expressions of comparison and contrast.
4. Discussion activities and exploring creative ideas.
   Any other related relevant classroom activity

UNIT III   **12**

Tenses - simple past, simple future and past perfect - Reading in Context -Listening & note-taking – single line – Definitions – sequencing of sentences – instruction - Persuasive speaking.

Suggested activities:
      1. a. Providing appropriate context for the use of tenses
      2. Listening and note-taking
      3. (a) Writing sentence definitions, instructions
         (b) Identifying the discourse links and sequencing jumbled sentences / writing instructions.
      4. Speaking exercises, discussions, role play exercises using explaining, convincing and persuasive strategies
        Any other related relevant classroom activity

UNIT IV   **12**

Modal verbs and Probability – Concord subject verb agreement – Correction of errors - Cause and effect expressions – Extended Definition - Speaking about the future plans.

Suggested activities:
      1. a. Making sentences using modal verbs to express probability
        b. Gap filling using relevant grammatical form of words.
      2. Writing extended definitions
      3. Speaking - role play activities, discussions, extempore speaking exercises speculating about the future.
      4. Any other related relevant classroom activity

UNIT V   **12**

'If' conditionals – Gerunds - Intensive reading - Speaking – Presentation of problems & solutions - Itinerary – planning for an industrial visit - Formal Letter writing – Letter to the editor, invititation letter, accepting, declining letter and permission letter.

Suggested activities:
    1. a) Sentence completion exercises using 'If' conditionals.
      b) Gap filling exercises using gerunds and present participle forms
    2. Reading comprehension exercises.
    3. Role play, discussion, debating and speaking activities for stating, discussing problems and suggesting solutions.
    4. Planning a tour, Writing a travel itinerary. Writing letters to officials and to the editor in formal/official contexts.
     Any other related relevant classroom activity

                                               TOTAL : 60 PERIODS

TEXT BOOK:
1. Department of Humanities & Social Sciences, Anna University, 'English for Engineers and Technologists' Combined Edition (Volumes 1 & 2), Chennai: Orient Longman Pvt. Ltd., 2006. Themes 1 – 4 (Resources, Energy, Computer, Transport)

REFERENCES:
1. Meenakshi Raman and Sangeeta Sharma, 'Technical Communication English skills for Engineers', Oxford University Press, 2008.
2. Andrea, J. Rutherford, 'Basic Communication Skills for Technology', Second Edition, Pearson Education, 2007.

EXTENSIVE READING:
1. A.P.J.Abdul Kalam with Arun Tiwari, 'Wings of Fire' An Autobiography, University Press (India) Pvt. Ltd.,1999, 30th Impression 2007.

 NOTE:
The book given under Extensive Reading is meant for inculcating the reading habit of the students. They need not be used for testing purposes.

MA2111	MATHEMATICS – I	L T P C
		3 1 0 4

UNIT I   MATRICES   12
Characteristic equation – Eigen values and eigen vectors of a real matrix – Properties – Cayley-Hamilton theorem (excluding proof) – Orthogonal transformation of a symmetric matrix to diagonal form – Quadratic form – Reduction of quadratic form to canonical form by orthogonal transformation.

UNIT II   THREE DIMENSIONAL ANALYTICAL GEOMETRY   12
Equation of a sphere – Plane section of a sphere – Tangent Plane – Equation of a cone – Right circular cone – Equation of a cylinder – Right circular cylinder.

UNIT III   DIFFERENTIAL CALCULUS   12
Curvature in Cartesian co-ordinates – Centre and radius of curvature – Circle of curvature – Evolutes – Envelopes – Evolute as envelope of normals.

UNIT IV   FUNCTIONS OF SEVERAL VARIABLES   12
Partial derivatives – Euler's theorem for homogenous functions – Total derivatives – Differentiation of implicit functions – Jacobians – Taylor's expansion – Maxima and Minima – Method of Lagrangian multipliers.

UNIT V   MULTIPLE INTEGRALS   12
Double integration – Cartesian and polar coordinates – Change of order of integration – Change of variables between Cartesian and polar coordinates – Triple integration in Cartesian co-ordinates – Area as double integral – Volume as triple integral

TOTAL: 60 PERIODS

TEXT BOOK:
1. Bali N. P and Manish Goyal, "Text book of Engineering Mathematics", Third edition, Laxmi Publications(p) Ltd.,(2008).
2. Grewal. B.S, "Higher Engineering Mathematics", 40th Edition, Khanna Publications, Delhi, (2007).

REFERENCES:
1. Ramana B.V, "Higher Engineering Mathematics", Tata McGraw Hill Publishing Company, New Delhi, (2007).
2. Glyn James, "Advanced Engineering Mathematics", 7th Edition, Pearson Education, (2007).
3. Jain R.K and Iyengar S.R.K," Advanced Engineering Mathematics", 3rd Edition, Narosa Publishing House Pvt. Ltd., (2007).

PH2111   **ENGINEERING PHYSICS – I**   **L T P C**
                                                            3 0 0 3

UNIT I   ULTRASONICS   9
Introduction – Production – magnetostriction effect - magnetostriction generator-piezoelectric effect - piezoelectric generator- Detection of ultrasonic waves properties – Cavitations - Velocity measurement – acoustic grating - Industrial applications – drilling, welding, soldering and cleaning – SONAR - Non Destructive Testing – pulse echo system through transmission and reflection modes - A,B and C –scan displays, Medical applications - Sonograms

UNIT II   LASERS   9
Introduction – Principle of Spontaneous emission and stimulated emission. Population inversion, pumping. Einsteins A and B coeffcients - derivation. Types of lasers – He-Ne, CO_2, Nd-YAG, Semiconductor lasers (homojunction & heterojunction) Qualitative Industrial Applications - Lasers in welding, heat treatment, cutting – Medical applications - Holography (construction & reconstruction).

UNIT III   FIBER OPTICS & APPLICATIONS   9
Principle and propagation of light in optical fibres – Numerical aperture and Acceptance angle - Types of optical fibres (material, refractive index, mode) – Double crucible technique of fibre drawing - Splicing, Loss in optical fibre – attenuation, dispersion, bending - Fibre optical communication system (Block diagram) - Light sources - Detectors - Fibre optic sensors – temperature & displacement - Endoscope.

UNIT IV   QUANTUM PHYSICS   9
Black body radiation – Planck's theory (derivation) – Deduction of Wien's displacement law and Rayleigh – Jeans' Law from Planck's theory – Compton effect. Theory and experimental verification – Matter waves – Schrödinger's wave equation – Time independent and time dependent equations – Physical significance of wave function – Particle in a one dimensional box - Electron microscope - Scanning electron microscope - Transmission electron microscope.

UNIT V   CRYSTAL PHYSICS   9
Lattice – Unit cell – Bravais lattice – 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 – NaCl, ZnS, diamond and graphite structures – Polymorphism and allotropy - Crystal defects – point, line and surface defects- Burger vector.

TOTAL: 45 PERIODS

TEXT BOOKS:
1. R. K. Gaur and S.C. Gupta, 'Engineering Physics' Dhanpat Rai Publications, New Delhi(2003)
2. M.N. Avadhanulu and PG Kshirsagar, 'A Text book of Engineering Physics', S.Chand and company, Ltd., New Delhi, 2005.

REFERENCES:
1. Serway and Jewett, 'Physics for Scientists and Engineers with Modern Physics', 6th Edition, Thomson Brooks/Cole, Indian reprint (2007)
2. Rajendran, V and Marikani A, 'Engineering Physics' Tata McGraw Hill Publications Ltd, III Edition, New Delhi, (2004).
3. Palanisamy, P.K., 'Engineering Physics' Scitech publications, Chennai, (2007).
4. Jayakumar. S, 'Engineering Physics', R.K. Publishers, Coimbatore, (2003).
5. Chitra Shadrach and Sivakumar Vadivelu, 'Engineering Physics', Pearson Education, New Delhi, (2007).

CY2111   ENGINEERING CHEMISTRY – I   L T P C
                                                                        3 0 0 3
 AIM

To impart a sound knowledge on the principles of chemistry involving the different application oriented topics required for all engineering branches.

OBJECTIVES
• The student should be conversant with the principles water characterization   and treatment of potable and industrial purposes.
• Principles of polymer chemistry and engineering applications of polymers
• Industrial applications of surface chemistry
• Conventional and non-conventional energy sources and energy storage   devices and Chemistry of engineering materials

UNIT I   WATER TECHNOLOGY   9
Characteristics – alkalinity – types of alkalinity and determination – hardness – types and estimation by EDTA method (problems); Domestic water treatment – disinfection methods (Chlorination, ozonation. UV treatment) – Boiler feed water – requirements – disadvantages of using hard water in boilers – internal conditioning (phosphate, calgon and carbonate conditioning methods) – external conditioning – demineralization process – desalination and reverse osmosis.

UNIT II   POLYMERS AND COMPOSITES   9
Polymers-definition – polymerization – types – addition and condensation polymerization – free radical polymerization mechanism – Plastics, classification – preparation, properties and uses of PVC, Teflon, polycarbonate, polyurethane, nylon-6,6, PET-Rubber -vulcanization of rubber, synthetic rubbers – buty1 rubber, SBR, Composites – definition, types polymer matrix composites – FRP only.

UNIT III   SURFACE CHEMISTRY   9
Adsorption – types – adsorption of gases on solids – adsorption isotherms – Frendlich and Langmuir isotherms – adsorption of solutes from solution – role of adsorbents in catalysis, ion-exchange adsorption and pollution abatement.

UNIT IV   NON-CONVENTIONAL ENERGY SOURCES AND
**   STORAGE DEVICES   9**
Nuclear energy – fission and fusion reactions and light water nuclear reactor for power generation (block diagram only) – breeder reactor – solar energy conversion – solar cells – wind energy – fuel cells – hydrogen – oxygen fuel cell – batteries – alkaline batteries – lead–acid, nickel–cadmium and lithium batteries.

UNIT V   ENGINEERING MATERIALS   9
Refractories – classification – acidic, basic and neutral refractories – properties (refractoriness, refractoriness under load, dimensional stability, porosity, thermal spalling) – manufacture of alumina, magnesite and zirconia bricks, Abrasives – natural and synthetic abrasives – quartz, corundum, emery, garnet, diamond, silicon carbide and boron carbide. Lubricants – mechanism of lubrication, liquid lubricants, - properties – viscosity index, flash and fire points, cloud and pour points, oilyness) – solid lubricants – graphite and molybdenum sulphide. Nanomaterials – introduction to nanochemistry – carbon nanotubes and their applications

TOTAL: 45 PERIODS

TEXT BOOKS:
1. P.C.Jain and Monica Jain, "Engineering Chemistry" Dhanpat Rai Pub, Co., New Delhi (2002).
2. S.S. Dara "A text book of engineering chemistry" S.Chand & Co.Ltd., New Delhi (2006).

REFERENCES:
1. B.K.Sharma "Engineering chemistry" Krishna Prakasan Media (P) Ltd., Meerut (2001).
2. B. Sivasankar "Engineering Chemistry" Tata McGraw-Hill Pub.Co.Ltd, New Delhi (2008).

GE2111   **ENGINEERING GRAPHICS**   **L T P C**
                                                                               2 3 0 5

AIM
To develop graphic skills in students.

OBJECTIVES
To develop in students graphic skill for communication of concepts, ideas and design of engineering products and expose them to existing national standards related to technical drawings.

Concepts and conventions (Not for Examination)   **1**
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   PLANE CURVES AND FREE HAND SKETCHING   15
 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.

Free hand sketching:
Representation of Three Dimensional objects – General principles of orthographic projection – Need for importance of multiple views and their placement – First angle projection – layout views – Developing visualization skills through free hand sketching of multiple views from pictorial views of objects.

UNIT II   PROJECTION OF POINTS, LINES AND PLANE SURFACES   14
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   15
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   15
Sectioning of above solids in simple vertical position by cutting planes inclined to one reference plane and perpendicular to the other – Obtaining true shape of section.

Development of lateral surfaces of simple and truncated solids – Prisms, pyramids, cylinders and cones – Development of lateral surfaces of solids with cylindrical cutouts, perpendicular to the axis.

UNIT V   ISOMETRIC AND PERSPECTIVE PROJECTIONS   15
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.

                                                                    TOTAL: 75 PERIODS

TEXT BOOKS:

1. N.D. Bhatt, "Engineering Drawing" Charotar Publishing House, 46th Edition, (2003).

REFERENCES:

1. K. V. Natrajan, "A text book of Engineering Graphics", Dhanalakshmi Publishers, Chennai (2006).
2. M.S. Kumar, "Engineering Graphics", D.D. Publications, (2007).
3. K. Venugopal & V. Prabhu Raja, "Engineering Graphics", New Age International (P) Limited (2008).
4. M.B. Shah and B.C. Rana, "Engineering Drawing", Pearson Education (2005).
5. K. R. Gopalakrishnana, "Engineering Drawing" (Vol.I&II), Subhas Publications (1998).
6. Dhananjay A.Jolhe, "Engineering Drawing with an introduction to AutoCAD" Tata McGraw Hill Publishing Company Limited (2008).
7. Basant Agarwal and Agarwal C.M., "Engineering Drawing", Tata McGraw Hill Publishing Company Limited, New Delhi, (2008).

Publication of Bureau of Indian Standards:

1. IS 10711 – 2001: Technical products Documentation – Size and lay out of drawing sheets.
2. IS 9609 (Parts 0 & 1) – 2001: Technical products Documentation – Lettering.
3. IS 10714 (Part 20) – 2001 & SP 46 – 2003: Lines for technical drawings.
4. IS 11669 – 1986 & SP 46 – 2003: Dimensioning of Technical Drawings.
5. IS 15021 (Parts 1 to 4) – 2001: Technical drawings – Projection Methods.

Special points applicable to University Examinations on Engineering Graphics:

1. There will be five questions, each of either or type covering all units of the syllabus.
2. All questions will carry equal marks of 20 each making a total of 100.
3. The answer paper shall consist of drawing sheets of A3 size only. The students will be permitted to use appropriate scale to fit solution within A3 size.
4. Whenever the total number of candidates in a college exceeds 150, the University Examination in that college will be conducted in two sessions (FN and AN on the same day) for 50 percent of student (approx) at a time.

GE2112   FUNDAMENTALS OF COMPUTING AND PROGRAMMING   L T P C
3 0 0 3

AIM :
To provide an awareness to Computing and Programming

OBJECTIVES :
- To enable the student to learn the major components of a computer system
- To know the correct and efficient ways of solving problems
- To learn to use office automation tools
- To learn to program in C

UNIT I   INTRODUCTION TO COMPUTERS   9
Introduction – Characteristics of Computers – Evolution of Computers - Computer Generations – Classification of Computers – Basic Computer organization – Number Systems

UNIT II   COMPUTER SOFTWARE   9
Computer Software –Types of Software – Software Development Steps – Internet Evolution - Basic Internet Terminology – Getting connected to Internet Applications.

UNIT III   PROBLEM SOLVING AND OFFICE APPLICATION SOFTWARE   9
Planning the Computer Program – Purpose – Algorithm – Flow Charts – Pseudocode - Application Software Packages- Introduction to Office Packages (not detailed commands for examination).

UNIT IV   INTRODUCTION TO C   9
Overview of C – Constants, Variables and Data Types – Operators and Expressions – Managing Input and Output operators – Decision Making - Branching and Looping.

UNIT V   FUNCTIONS AND POINTERS   9
Handling of Character Strings – User-defined Functions – Definitions – Declarations - Call by reference – Call by value – Structures and Unions – Pointers – Arrays – The Preprocessor – Developing a C Program : Some Guidelines

TOTAL: 45 PERIODS

TEXT BOOKS:
1. Ashok.N.Kamthane," Computer Programming", Pearson Education (India) (2008).
2. Behrouz A.Forouzan and Richard.F.Gilberg, "A Structured Programming Approach Using C", II Edition, Brooks-Cole Thomson Learning Publications, (2007).

REFERENCES:
1. Pradip Dey, Manas Ghoush, "Programming in C", Oxford University Press. (2007).
2. Byron Gottfried, "Programming with C", 2nd Edition, (Indian Adapted Edition), TMH publications, (2006).
3. Stephen G.Kochan, "Programming in C", Third Edition, Pearson Education India, (2005).
4. Brian W.Kernighan and Dennis M.Ritchie, "The C Programming Language", Pearson Education Inc., (2005).
5. E.Balagurusamy, "Computing fundamentals and C Programming", Tata McGraw-Hill Publishing Company Limited, (2008).
6. S.Thamarai Selvi and R.Murugan, "C for All", Anuradha Publishers, (2008).

GE2115   **COMPUTER PRACTICE LABORATORY – I**   **L T P C**
                                                               0 0 3 2

LIST OF EXERCISES

a) Word Processing   **15**

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

b) Spread Sheet   **15**

5. Chart - Line, XY, Bar and Pie.
6. Formula - formula editor.
7. Spread sheet - inclusion of object, Picture and graphics, protecting the document
   and sheet.
8. Sorting and Import / Export features.

Simple C Programming *   **15**

9. Data types, Expression Evaluation, Condition Statements.
10. Arrays
11. Structures and Unions
12. Functions

                                              TOTAL: 45 PERIODS

* For programming exercises Flow chart and pseudocode are essential

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

GE2116   **ENGINEERING PRACTICES LABORATORY**   **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.

GROUP A (CIVIL & MECHANICAL)

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 & ELECTRONICS)

III   ELECTRICAL ENGINEERING PRACTICE   10
1. Residential house wiring using switches, fuse, indicator, lamp and energy meter.
2. Fluorescent lamp wiring.
3. Stair case wiring
4. Measurement of electrical quantities – voltage, current, power & power factor in RLC circuit.
5. Measurement of energy using single phase energy meter.
6. Measurement of resistance to earth of an electrical equipment.

IV   ELECTRONICS ENGINEERING PRACTICE   13
1. Study of Electronic components and equipments – Resistor, colour coding measurement of AC signal parameter (peak-peak, rms period, frequency) using CR.
2. Study of logic gates AND, OR, EOR and NOT.
3. Generation of Clock Signal.
4. Soldering practice – Components Devices and Circuits – Using general purpose PCB.
5. Measurement of ripple factor of HWR and FWR.

TOTAL: 45 PERIODS

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

SEMESTER EXAMINATION PATTERN

The Laboratory examination is to be conducted for Group A & Group B, allotting 90 minutes for each group, with a break of 15 minutes. Both the examinations are to be taken together in sequence, either in the FN session or in the AN session. The maximum marks for Group A and Group B lab examinations will be 50 each, totaling 100 for the Lab course. The candidates shall answer either I or II under Group A and either III or IV under Group B, based on lots.

Engineering Practices Laboratory

List of equipment and components

(For a Batch of 30 Students)

CIVIL

1. Assorted components for plumbing consisting of metallic pipes, plastic pipes, flexible pipes, couplings, unions, elbows, plugs and other fittings.	15 Sets.
2. Carpentry vice (fitted to work bench)	15 Nos.
3. Standard woodworking tools	15 Sets.
4. Models of industrial trusses, door joints, furniture joints	5 each
5. Power Tools: (a) Rotary Hammer	2 Nos
(b) Demolition Hammer	2 Nos
(c) Circular Saw	2 Nos
(d) Planer	2 Nos
(e) Hand Drilling Machine	2 Nos
(f) Jigsaw	2 Nos

MECHANICAL

1. Arc welding transformer with cables and holders	5 Nos.
2. Welding booth with exhaust facility	5 Nos.
3. Welding accessories like welding shield, chipping hammer, wire brush, etc.	5 Sets.
4. Oxygen and acetylene gas cylinders, blow pipe and other welding outfit.	2 Nos.
5. Centre lathe	2 Nos.
6. Hearth furnace, anvil and smithy tools	2 Sets.
7. Moulding table, foundry tools	2 Sets.
8. Power Tool: Angle Grinder	2 Nos
9. Study-purpose items: centrifugal pump, air-conditioner	One each.

ELECTRICAL

1. Assorted electrical components for house wiring	15 Sets
2. Electrical measuring instruments	10 Sets
3. Study purpose items: Iron box, fan and regulator, emergency lamp 1 each
4. Megger (250V/500V)	1 No.
5. Power Tools: (a) Range Finder	2 Nos
(b) Digital Live-wire detector	2 Nos

ELECTRONICS

1. Soldering guns	10 Nos.
2. Assorted electronic components for making circuits	50 Nos.
3. Small PCBs	10 Nos.
4. Multimeters	10 Nos.
5. Study purpose items: Telephone, FM radio, low-voltage power supply	

PHYSICS LABORATORY – I

L T P C
0 0 3 -

LIST OF EXPERIMENTS

1. (a) Particle size determination using Diode Laser
   (b) Determination of Laser parameters – Wavelength, and angle of divergence.
   (c) Determination of acceptance angle in an optical fiber.
2. Determination of thickness of a thin wire – Air wedge method
3. Determination of velocity of sound and compressibility of liquid – Ultrasonic interferometer.
4. Determination of 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

- **A minimum of FIVE experiments shall be offered.**
- **Laboratory classes on alternate weeks for Physics and Chemistry.**
- **The lab examinations will be held only in the second semester.**

CHEMISTRY LABORATORY – I

L T P C
0 0 3 -

LIST OF EXPERIMENTS

1. Estimation of hardness of Water by EDTA
2. Estimation of Copper in brass by EDTA
3. Determination of DO in water (Winkler's method)
4. Estimation of Chloride in Water sample (Argentometric)
5. Estimation of alkalinity of Water sample
6. Determination of molecular weight and degree of polymerization using viscometry.

- **A minimum of FIVE experiments shall be offered.**
- **Laboratory classes on alternate weeks for Physics and Chemistry.**
- **The lab examinations will be held only in the second semester.**