NATIONAL ENGINEERING COLLEGE

(An Autonomous Institution – Affiliated to Anna University Chennai)

K.R.NAGAR, KOVILPATTI – 628 503
www.nec.edu.in

REGULATIONS – 2011

DEPARTMENT OF

INFORMATION TECHNOLOGY

CURRICULUM AND SYLLABI OF

B.Tech.- INFORMATION TECHNOLOGY

REGULATIONS 2011

CURRICULUM AND SYLLABI FOR FULL TIME

B.Tech. - INFORMATION TECHNOLOGY

SEMESTER – I

Common to all B.E. / B.Tech. Degree Programmes)

S.No	Course Code	Course Title	L	T	P	C
THEORY						
1.	BEG101	Technical English – I	3	1	0	4
2.	BMA101	Mathematics – I	3	1	0	4
3.	BPH101	Engineering Physics – I	3	0	0	3
4.	BCY101	Engineering Chemistry – I	3	0	0	3
5.	BCS101	Fundamentals of Computing and Programming	3	0	0	3
6.	BME101	Engineering Graphics	2	3	0	4
PRACTICAL						
7.	BCS131	Computer Practice Laboratory – I	0	0	3	2
8.	BPC131	Physics and Chemistry Laboratory –I	0	0	3	2
9.	BME131	Engineering Practices Laboratory	0	0	3	2
Total Number of Credits :						**27**

SEMESTER – II

S.No	Course Code	Course Title	L	T	P	C
THEORY						
1.	BEG201	Technical English – II*	3	0	0	3
2.	BMA201	Mathematics – II*	3	1	0	4
3.	BPH201	Engineering Physics – II *	3	0	0	3
4.	BCY201	Engineering Chemistry – II *	3	0	0	3
5. a.	BME201	Engineering Mechanics (For Mechanical & Civil branches)	3	1	0	4
b.	BEE201	Circuit Theory (For EEE & EIE branches)	3	1	0	4
c.	BEC201	Electric Circuits and Electron Devices (For CSE, IT & ECE branches)	3	1	0	4
6. a.	BEE202	Basic Electrical & Electronics Engineering (For Mechanical & Civil branches)	4	0	0	4
b.	BME202	Basic Civil & Mechanical Engineering (For CSE, IT, EEE, EIE & ECE branches)	4	0	0	4
PRACTICAL						
7.	BCS231	Computer Practice Laboratory – II*	0	1	2	2
8.	BPC231	Physics & Chemistry Laboratory – II*	0	0	3	2
9. a.	BME231	Computer Aided Drafting and Modeling Laboratory (For Mechanical & Civil branches)	0	1	2	2
b.	BEE231	Electrical Circuits Laboratory (For EEE & EIE branches)	0	0	3	2
c.	BEC231	Circuits and Devices Laboratory (For ECE, CSE & IT branches)	0	0	3	2
10.	BEG231	English Language Skill Laboratory* (Skill of Listening)	0	0	3	2
		Total Number of Credits :				**29**

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

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SEMESTER – III

S.No	Course Code	Course Title	L	T	P	C
THEORY						
1.	BMA301	Transforms and Partial Differential Equations	3	1	0	4
2.	BCE301	Environmental Science and Engineering	3	0	0	3
3.	BIT301	Data Structures and Algorithms using C	3	0	0	3
4.	BEI303	Digital Principles and System Design	3	1	0	4
5.	BCS302	Object Oriented Programming	3	0	0	3
6.	BIT302	Principles of Communication	3	1	0	4
PRACTICAL						
7.	BEI332	Digital Laboratory	0	0	3	2
8.	BIT331	Data Structures and Algorithms using C Laboratory	0	0	3	2
9.	BCS332	Object Oriented Programming Laboratory	0	0	3	2
10.	BEG331	Communication Skills and Technical Seminar – I	0	0	3	2
		TOTAL	**18**	**3**	**12**	**29**

SEMESTER – IV

S.No	Course Code	Course Title	L	T	P	C
THEORY						
1.	BIT401	Software Engineering and Quality Assurance	3	0	0	3
2.	BCS402	Microprocessors and Microcontrollers	3	0	0	3
3.	BCS403	Computer Organization and Architecture	3	1	0	4
4.	BMA402	Probability and Queueing Theory	3	1	0	4
5.	BCS404	Operating Systems	3	0	0	3
6.	BCS405	Database Management Systems	3	0	0	3
PRACTICAL						
7.	BCS431	Operating Systems Laboratory	0	0	3	2
8.	BCS432	Database Management Systems Laboratory	0	0	3	2
9.	BCS433	Microprocessors Laboratory	0	0	3	2
10.	BEG431	Communication Skills and Technical Seminar – II	0	0	3	2
		TOTAL	**18**	**2**	**12**	**28**

SEMESTER – V

S.No	Course Code	Course Title	L	T	P	C
THEORY						
1.	BIT501	System Software	3	1	0	4
2.	BIT502	Principles of Object Oriented Analysis and Design	3	0	0	3
3.	BCS502	Computer Networks	3	0	0	3
4.	BCS503	Theory of Computation	3	1	0	4
5.	BCS005	C# and .NET Technologies	3	0	0	3
6.	BGE501	Professional Ethics and Human Values	3	0	0	3
PRACTICAL						
7.	BIT531	System Software Laboratory	0	0	3	2
8.	BIT532	CASE Tools Laboratory	0	0	3	2
		TOTAL	**18**	**2**	**6**	**24**

SEMESTER – VI

S. No	Course Code	Course Title	L	T	P	C
THEORY						
1.	BIT601	Network Programming and Network Management	3	0	0	3
2.	BIT602	Digital Signal Processing	3	1	0	4
3.	BIT603	Principles of Compiler Design	3	0	0	3
4.	BIT604	Embedded Systems	3	0	0	3
5.	BIT605	Object Oriented Programming using Java	3	1	0	4
6.	E1	Elective I	3	0	0	3
PRACTICAL						
7.	BIT631	Network Programming Laboratory	0	0	3	2
8.	BIT632	Java Laboratory	0	0	3	2
9.	BIT633	Comprehension	0	3	0	1
		TOTAL	**18**	**5**	**6**	**25**

SEMESTER VII

Sl. No.	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	BIT701	Information Theory and Coding	3	1	0	4
2.	BIT702	Computer Graphics and Multimedia	3	1	0	4
3.	BIT703	Web Technology	3	1	0	4
4.	BCS006	Cryptography and Network Security	3	0	0	3
5.	E3	Elective III	3	0	0	3
PRACTICAL						
6.	BIT731	Computer Graphics and Multimedia Laboratory	0	0	3	2
7.	BIT732	Web Technology Laboratory	0	0	3	2
8.	BIT733	Mobility with Android *	0	0	3	2
		Total No. of Credits				**24**

SEMESTER VIII

Sl. No.	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	BIT801	Mobile Communication	3	0	0	3
2.	BMG601	Principles of Management	3	0	0	3
3.	E4	Elective IV	3	0	0	3
4.	E5	Elective V	3	0	0	3
PRACTICAL						
5.	BIT831	Project Work	0	0	18	12
		Total No. of Credits				**24**

* - Elective Lab

TOTAL CREDITS TO BE EARNED FOR THE AWARD OF THE DEGREE – 210

Elective I

S. No.	Course Code	Course Title	L	T	P	C
1.	BIT001	Information Storage and Management	3	0	0	3
2.	BIT002	Distributed Systems	3	0	0	3
3.	BIT003	Mobility Engineering	3	0	0	3
4.	BCS003	Unix Internals	3	0	0	3
5.	BCS007	Data Warehousing and Data Mining	3	0	0	3

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Elective II   (PRACTICAL COURSE)

Sl. No.	COURSE CODE	COURSE TITLE	L	T	P	C
1.	BIT733	Mobility with Android *	0	0	3	2

Elective III

Sl. No.	COURSE CODE	COURSE TITLE	L	T	P	C
1.	BIT007	Software Project Management	3	0	0	3
2.	BIT008	Wireless Sensor Networks	3	0	0	3
3.	BIT009	User Interface Design	3	0	0	3
4.	BCS010	Advanced Java Programming	3	0	0	3
5.	BGE003	Intellectual Property Rights	3	0	0	3

Elective IV

Sl. No.	COURSE CODE	COURSE TITLE	L	T	P	C
1.	BIT010	Parallel Computing	3	0	0	3
2.	BIT011	Cloud Computing	3	0	0	3
3.	BCS025	Green Computing	3	0	0	3
4.	BCS009	High Speed Networks	3	0	0	3
5.	BCS018	Service Oriented Architecture	3	0	0	3

Elective V

Sl. No.	COURSE CODE	COURSE TITLE	L	T	P	C
1.	BIT012	Knowledge Management	3	0	0	3
2.	BIT013	Information Security	3	0	0	3
3.	BCS013	M-Commerce	3	0	0	3
4.	BCS015	Adhoc Networks	3	0	0	3
5.	BCS027	Nature and Bio Inspired Computing	3	0	0	3

BEG101   **TECHNICAL ENGLISH – I**   **L T P C**
                                                                            3 1 0 4

UNIT I   **12**
General Vocabulary – Changing words from one form to another – Adjectives, Comparative adjectives – Active and Passive voice – Tenses – simple present, present continuous – 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 activities using prefixes and suffixes.
   b. Exercises using questions – asking & answering questions.
2. Scanning the text for specific information.
3. Listening and 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 – Reading & note-making – single line – Definitions – sequencing of sentences – instruction writing – Persuasive speaking.

Suggested activities:

1. Providing appropriate context for the use of tenses
2. Listening and note-taking
3. (a) Writing sentence definitions and instructions
   (b) Identifying the discourse links and sequencing jumbled sentences.
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.

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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.
   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, invitation 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. Writing letters to officials and to the editor in formal/official contexts.
   Any other related relevant classroom activity.

TOTAL: 60 PERIODS

AREAS TO BE COVERED UNDER DIFFERENT HEADINGS:

A) Language focus
1. Suffixes and Prefixes
2. Transformation of words from one form to another (Derivatives from root words)
3. Matching words & meanings (synonyms)
4. Compound nouns
5. Degrees of comparison
6. Active and passive voice-impersonal passive
7. Tenses: simple present, simple past, simple future, present continuous, past continuous, Present Perfect.
8. Modal verbs
9. 'Wh' Question forms
10. Conditional clause
11. Gerunds and infinitives
12. Expressing Cause and effect
13. Concord
14. Punctuation
15. Writing definitions

B) Reading
1. Reading in context
2. Skimming and scanning
3. Scanning the text for specific information
4. Reading and note-making
5. Intensive reading for making inferences
6. Reading comprehension

C) Listening:
1. Listening and transfer of information
2. Listening & note taking

D) Writing:
1. Transformation of information from graphical data to written form and from written form to graphical Form.
2. Paragraph writing – Description
3. Paragraph Writing – comparison and contrast.
4. Note-making
5. Writing Instructions
6. Jumbled sentences
7. Letter writing – Formal letters (Invitation, Accepting, Declining, Permission Letters) Letters to the editor

E) Speaking:

1. Discussing as a group and making oral reports,
2. Role play-Conversation techniques – convincing others
3. Creative thinking and speaking, Exploring creative ideas
4. Persuasive strategies
5. Speaking about the future plans
6. Extempore speech – Speaking exercises speculating about the future
7. Presentation of problems and solutions
8. Debates

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', 2nd Edition, Pearson Education, 2007.

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

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BMA101   **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", 3rd Edition, Laxmi Publications (P) Ltd., (2008).

REFERENCES:
1. Grewal. B.S, "Higher Engineering Mathematics", 40th Edition, Khanna Publications, Delhi, (2007).
2. Ramana B.V, "Higher Engineering Mathematics", Tata McGraw Hill Publishing Company, New Delhi, (2007).
3. Glyn James, "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).

BPH101   **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 – Jean's 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.

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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 Mc Graw 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).

BCY101   **ENGINEERING CHEMISTRY – I**   **L T P C**
                                                                       3 0 0 3

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 – butyl 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" Tate McGraw-Hill Pub.Co.Ltd., New Delhi (2008).

BCS101   FUNDAMENTALS OF COMPUTING AND PROGRAMMING   L T P C
                                                                                                        3 0 0 3

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 AUTOMATION   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", Second Edition, Brooks-Cole Thomson Learning Publications (2007).

REFERENCES:
1. Pradip Dey and Manas Ghoush, "Programming in C", Oxford University Press (2007).
2. Byron Gottfried, "Programming with C", 2nd Edition, (Indian Adapted Edition), TMH publications (2006). (Unit II, III, IV, and V).
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).

BME101   **ENGINEERING GRAPHICS**   **L T P C**
                                                                           2 3 0 4

UNIT I   PLANE CURVES AND FREE HAND SKETCHING   12
CURVES USED IN ENGINEERING PRACTICES:
Conics – Construction of ellipse, Parabola and hyperbola by eccentricity method – Construction of cycloid – construction of involutes of square 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   12
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   12
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   12
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   12
Principles of isometric projection – isometric scale – isometric projections of simple solids, truncated prisms, pyramids, cylinders and cones, Combination of any two simple solids. Perspective projection of prisms, pyramids and cylinders by visual ray method and vanishing point method.
                                                                 TOTAL: 60 PERIODS
TEXT BOOK:
1. N.D. Bhatt, "Engineering Drawing" Charotar Publishing House, 46th Edition, (2003).

REFERENCES:
1. K.V.Natarajan, "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).

BCS131   **COMPUTER PRACTICE LABORATORY – I**   **L T P C**
                                                                          0 0 3 2

LIST OF EXERCISES
I. MS Office

a) WORD PROCESSING
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
1. Chart - Line, XY, Bar and Pie.
2. Formula - formula editor.
3. Spread sheet - inclusion of object, picture and graphics, protecting the document and sheet.
4. Sorting and Import / Export features.

II SIMPLE C PROGRAMMING
1. Data types, Expression evaluation, Conditional statements.
2. Arrays.
3. Structures and Unions.
4. Functions.

TOTAL: 45 PERIODS

For programming exercises Flow chart and pseudocode are essential.

HARDWARE / SOFTWARE REQUIRED FOR A BATCH OF 60 STUDENTS

HARDWARE
- LAN System with 66 nodes (OR) Standalone PCs – 66 Nos.
- Printers – 3 Nos.

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

BPC131   PHYSICS AND CHEMISTRY LABORATORY – I   L T P C
0 0 3 2

PHYSICS LABORATORY – I

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.

B. CHEMISTRY LABORATORY – I

LIST OF EXPERIMENTS

1.   Estimation of hardness of Water by EDTA method.
2.   Estimation of Copper in brass by EDTA method.
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.

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BME131   ENGINEERING PRACTICES LABORATORY   L T P C
                                                       0 0 3 2

GROUP A (CIVIL & MECHANICAL)

I CIVIL ENGINEERING PRACTICE
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
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.

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GROUP B (ELECTRICAL & ELECTRONICS)

III ELECTRICAL ENGINEERING PRACTICE
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
1. Study of Electronic components and equipments – Resistor colour coding, measurement of AC signal parameters (peak-peak value, rms value period, frequency) usindg CRO.
2. Study of logic gates AND, OR, EX-OR and NOT.
3. Generation of Clock Signal.
4. Soldering practice – Components Devices and Circuits – Using general purpose PCB.
5. Measurement of ripple factor for 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 Publishing 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).

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BEG201	**TECHNICAL ENGLISH – II**	**L T P C**
	(*Common to all branches*)	**3 0 0 3**

AIM

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

OBJECTIVES

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

UNIT I   10

Technical Vocabulary – meanings in context, sequencing words, Articles – Prepositions, intensive reading and predicting content, Reading and interpretation, extended definitions, process description.

Suggested activities

1. Exercises on word formation using the prefix 'self' – Gap filling with preposition Exercises – Using sequence words
2. Reading comprehension exercise with questions based on inference – Reading heading and predicting the content – reading advertisements and interpretation
3. Writing extended definitions – Writing description of processes – Writing paragraphs based on discussions – Writing paragraphs describing the future

UNIT II   10

Phrases / structure indicating cause/purpose – Adverbs – Skimming – Non-verbal communication – Listening – correlating verbal and non-verbal communication – speaking in group discussion – 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 categories data in tables.
3. Writing formal letters – quotations, placing orders, clarification, and complaint, Letter seeking permission for industrial visits, writing analytical paragraphs on different debatable issues.

UNIT III   10

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

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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.
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 questions.
4. Sequencing of jumbled sentences using connectives – Writing different types of reports like industrial accident report and survey report – writing recommendations.

UNIT IV   10

Numerical adjectives – Oral instructions – Descriptive writing – Argumentative paragraphs – Letter of application – content, format (CV/Bio-data) – instructions, imperative forms – preparing checklists, Yes/No question form – Email 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   5

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 45 periods

AREAS TO BE COVERED UNDER DIFFERENT HEADINGS
A. Language Focus
1. Technical vocabulary
2. Sequencing words
3. Articles
4. Prepositions
5. Word formation using prefixes
6. Phrases / Structure indicating purpose
7. Adverbs
8. Cause and effect expressions
9. Tense forms
10. Different grammatical forms of the same word
11. Numerical adjectives
12. Extended definitions

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B. Reading
1. Intensive reading and predicting content
2. Reading and interpretation
3. Skimming
4. Critical reading
5. Reading comprehension exercises

C. Listening
1. Correlating verbal and non-verbal communication
2. Listening comprehension

D. Speaking
1. Group Discussions
2. Stress and intonation
3. Role plays and giving oral instructions
4. Discussion of problems and solutions

E. Writing
1. Process description
2. Formal letter writing
3. Writing analytical paragraphs
4. Report Writing
5. Descriptive writing
6. Argumentative paragraphs
7. Letter of application
8. Instructions
9. Recommendations
10. Checklists preparation
11. Email Communication
12. Writing critical essays
13. Writing proposals

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

REFERENCES:
1. Mark Abbot son, "Technical English for professionals" (2009).
2. P.K. Dutt, G. Rajeevan and C.L.N Prakash, 'A Course in Communication Skills', Cambridge University Press, India 2007.
3. Krishna Mohan and Meera Banerjee, 'Developing Communication Skills', Macmillan India Ltd., (Reprinted 1994 – 2007).
4. Edgar Thorpe, Showick Thorpe, 'Objective English', Second Edition, Pearson Education, 2007.
5. Rodney Huddleston and Geoffrey Pullum, 'A students introduction to English Grammar', Cambridge University Press, 2007.
6. Jack C.Richards, Jonathan Hull and Susan Protor, 'English for International Communication', Third Edition, Cambridge University Press, 2004.

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.

BMA201	MATHEMATICS – II	L T P C
	(Common to all branches)	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 stoke's 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).

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BPH201   ENGINEERING PHYSICS – II   **L T P C**
        (*Common to all branches*)   **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) – ferro electricity and applications.

UNIT V   MODERN ENGINEERING MATERIALS   **9**
Metallic glasses: preparation, properties and applications. Shape Memory Alloys (SMA): Characteristics, properties of Ni-Ti alloy, application, advantages and disadvantages of SMA. Nanomaterials: synthesis – plasma arcing – chemical vapour deposition – sol-gels – electrodeposition – ball milling – properties of nanoparticles and applications. Carbon nanotubes: fabrication – arc method – pulsed laser deposition – chemical vapour deposition – structure – properties and applications.

                                                                TOTAL: 45 PERIODS

TEXT BOOKS:
1. 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. G.Senthil Kumar, 'Engineering Physics – II' VRB Publishers Pvt Ltd., Chennai (2010)
2. B.N.Sankar and S.O.Pillai, 'Engineering Physics', New Age International Publishers (2008) New Delhi.
3. Jayakumar .S. 'Materials Science', R.K. Publishers, Coimbatore (2008).
4. Palanisamy.P.K, 'Materials Science', Scitech publications (India) Pvt. Ltd., Chennai, 2nd Edition (2007).
5. M.Arumugam, 'Materials Science' Anuradha Publications, Kumbakonam (2006).
6. Rajendran.V and Marikani.A, 'Materials Science' Tata McGraw Hill publications, New Delhi (2004).

BCY201   ENGINEERING CHEMISTRY – II   L T P C
             (*Common to all branches*)   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 of 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 – potentiometric titrations (redox Fe^{2+} vs dichromate and precipitation – $Ag+$ vs Cl^- titration) and conductometric 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 current cathodic 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 by product oven 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

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TEXT BOOKS:
1. P.C.Jain and Monica Jain, "Engineering Chemistry" Dhanpat Rai Pub. Co., New Delhi, 15th Edition (2009).
2. S.S.Dara "A text book of Engineering Chemistry" S.Chand & Co. Ltd., New Delhi (2006)

REFERENCES:
1. A Text book of Physical Chemistry by A.S.Negi & S.C. Anand, New Age International Pvt. Ltd., New Delhi (2009)
2. B.Sivasankar "Engineering Chemistry" Tata McGraw-Hill Pub.Co.Ltd., New Delhi (2008)
3. Principles of Physical Chemistry, AR Puri, LR Sharma, M.S. Pathania, Vishal Publication, (2005)
4. B.K.Sharma "Engineering Chemistry" Krishna Prakasan Media (P) Ltd., Meerut (2001)

(a) BME201   **ENGINEERING MECHANICS**   **L   T   P C**
                         (For Mechanical & Civil Branches)   **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 – Lami'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, 9th edition (2010)

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REFERENCES:

1. Rajasekaran.S, Sankarasubramanian.G., "Fundamentals of Engineering Mechanics", Vikas Publishing House Pvt. Ltd., 3rd Edition (2010).
2. Hibbeller, R.C., "Engineering Mechanics", Vol. 1 Statics, Vol. 2 Dynamics, Pearson Education Asia Pvt. Ltd., 12th Edition (2010).
3. Irving H. Shames, "Engineering Mechanics – Statics and Dynamics", IV Edition – Pearson Education Asia Pvt. Ltd., (2003).
4. Ashok Gupta, "Interactive Engineering Mechanics – Statics – A Virtual Tutor (CDROM)", Pearson Education Asia Pvt., Ltd., (2002).
5. Palanichamy.M.S., Nagam, S., "Engineering Mechanics – Statics & Dynamics", Tata McGraw-Hill (2001).

(b)	BEE201	CIRCUIT THEORY	L	T	P	C
		(For EEE & EIE 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 Norton Theorem – Superposition Theorem – Maximum power transfer theorem – Reciprocity Theorem.

UNIT III   RESONANCE AND COUPLED CIRCUITS   12

Series and parallel 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. input (Sinusoidal).

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 & unbalanced loads – phasor diagram of voltages and currents – power and power factor measurements in three phase circuits.

TOTAL: 60 PERIODS

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

REFERENCES:
1. John Bird "Electrical Circuit Theory and Technology" Fourth Edition, Newnes Publications (2010)
2. Charles K.Alexander, Mathew N.O.Sadik, "Fundamentals of Electric circuits", 2nd Edition, McGraw Hill (2003).
3. Joseph A. Edminister, Mahmood Nahri, "Electric circuits", Schaum's series, Tata McGraw-Hill, New Delhi (2001).
4. Paranjothi SR, "Electric Circuits Analysis," New Age International Ltd., New Delhi, (1996).
5. Chakrabati A, "Circuits Theory (Analysis and synthesis), Dhanpath Rai & Sons, New Delhi (1999).

(c) BEC201   ELECTRIC CIRCUITS AND ELECTRON DEVICES   L T P C
                (For ECE, CSE and IT 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
TEXT BOOKS:
1. Joseph A. Edminister, Mahmood, Nahri, "Electric Circuits" – Shaum series, Tata McGraw Hill (2001)
2. Salivahanan, N. Suresh kumar and A.Vallavaraj, "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. William H. Hayt, J.V. Jack, E. Kemmebly and Steven M. Durbin, "Engineering Circuit Analysis", Tata McGraw Hill (2011.)
2. A.Sudhakar, Shyammohan S Palli, "Circuits and Networks-Analysis and Synthesis", Tata McGraw Hill, 4th edition (2010)
3. Robert T.Paynter, "Introducing Electronics Devices and Circuits", Pearson Education, 7th Education (2008).
4. J.Millman & Halkins, Satyebranta Jit, "Electronic Devices & Circuits", Tata McGraw Hill, 2nd Edition (2008).
5. William H. Hayt, J.V. Jack, E. Kemmebly and steven M. Durbin, "Engineering Circuit Analysis", Tata McGraw Hill, 6th Edition (2002).

(a) BEE202   BASIC ELECTRICAL & ELECTRONICS ENGINEERING   L T P C
(For Mechanical & Civil Branches)   4 0 0 4

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   MACHINES   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 (simple 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. R.S. Sedha, "Applied Electronics" S. Chand & Co., 2006.
2. V.N. Mittle "Basic Electrical Engineering", Tata McGraw Hill Edition, New Delhi, 1990.

REFERENCES:
1. Gnanavadivel,C. Senthilkumar, A. Vijaykumar, S. Joseph Gladwin, "Basic Electrical and Electronics Engineering", Anuradha Publishers (2011).
2. Muthusubramanian.R, Salivahanan.S and Muraleedharan.K.A, "Basic Electrical, Electronics and Computer Engineering", Tata McGraw Hill, Second Edition (2006).
3. Nagsarkar T K and Sukhija M S, "Basics of Electrical Engineering", Oxford press (2005).
4. Premkumar N, "Basic Electrical Engineering", Anuradha Publishers (2003).
5. Mahmood Nahvi and Joseph A. Edminister, "Electric Circuits", Schaum Outline Series, McGraw Hill (2002).
6. Mehta V K, "Principles of Electronics", S.Chand & Company Ltd., (1994).

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Curriculum & Syllabus for B.Tech. (IT)   Regulations-2011

(b)   BME202 BASIC CIVIL & MECHANICAL ENGINEERING   L T P C
(For CSE, ECE, EEE, EIE & IT branches)   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   IC 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 Mechanical Engineering", 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).

BCS231   **COMPUTER PRACTICE LABORATORY – II**   **L T P C**
                    (*Common to all branches*)   **0 1 2 2**

LIST OF EXPERIMENTS

1. UNIX COMMANDS

Study of Unix OS – Basic Shell Commands – Vi Editor.

2. SHELL PROGRAMMING

Simple Shell program – Conditional Statements – Testing and Loops.

3. C PROGRAMMING ON UNIX

Dynamic Storage Allocation – Pointers – Functions – File Handling.

TOTAL: 45 PERIODS

HARDWARE / SOFTWARE REQUIREMENTS FOR A BATCH OF 30 STUDENTS

Hardware

- UNIX Clone Server – 1 No
- Nodes (thin client or PCs) – 33 Nos
- Printer – 3 Nos.

Software

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

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BPC231   PHYSICS AND CHEMISTRY LABORATORY – II   **L T P C**

(*Common to all branches*)   **0 0 3 2**

PHYSICS LABORATORY – II

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.**

CHEMISTRY LABORATORY – II

LIST OF EXPERIMENTS

1. Conductometric titration (Simple acid base)
2. Conductometric titration (Mixture of weak and strong acids)
3. Conductometric titration using $BaCl_2$ Vs Na_2SO_4
4. Potentiometric Titration (Fe^{2+} Vs $K_2Cr_2O_7$)
5. pH Titration (Acid & Base)
6. Determination of water of crystallization of a crystalline salt ($CuSO_4$)
7. Estimation of Ferric ion by spectrophotometry.

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

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

(a) BME231 COMPUTER AIDED DRAFTING AND MODELING LABORATORY L T P C
(For Mechanical & Civil Branches)   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 Nos.
2. Licensed software for Drafting and Modeling – 30 Licenses
3. Laser Printer or Plotter to print / plot drawings – 2 Nos.

(b)   BEE231   ELECTRICAL CIRCUITS LABORATORY   L T P C
(For EEE & EIE branches)   0   0 3 2

LIST OF EXPERIMENTS

- Verification of ohm's laws and kirchoff's laws.
- Verification of Thevenin's and Norton's Theorem
- Verification of superposition Theorem
- Verification of maximum power transfer theorem.
- Verification of reciprocity theorem
- Measurement of self inductance of a coil
- Verification of mesh and nodal analysis.
- Transient response of RL and RC circuits for DC input.
- Frequency response of series and parallel resonance circuits.
- Frequency response of single tuned circuits.

TOTAL: 45 PERIODS

(c)   BEC231 CIRCUITS AND DEVICES LABORATORY   **L T P C**
(For ECE, CSE & IT branches)   **0   0 3 2**

- Verification of KVL and KCL
- Verification of Thevenin and Norton Theorems.
- Verification of superposition Theorem.
- Verification of Maximum power transfer and reciprocity theorems.
- Frequency response of series and parallel resonance circuits.
- Characteristics of PN and Zener diode
- Characteristics of CE configuration
- Characteristics of CB configuration
- Characteristics of UJT and SCR
- Characteristics of JFET and MOSFET
- Characteristics of Diac and Triac.
- Characteristics of Photodiode and Phototransistor.

TOTAL: 45 PERIODS

BEG231   ENGLISH LANGUAGE SKILL LABORATORY (Skill of Listening)   L T P C
(Common to all branches)   0 0 3 2

UNIT I (Micro Skills I)   **4**
Tasks (Type I): Lexical word identification
    A. Identifying the homophones/words with silent letters/often mispronounced words
    B. Identifying the missing words in native speech (Native accent)

Tasks (Type II): Decompressing structures
    A. Expanding sound units into word clusters (Ex: verbs with multiple auxiliaries/contracted forms)
    B. Identifying the constituent words in collocations/compound words/idiomatic phrases

UNIT II (Micro Skills II): Identifying tonal variations for meaning making   **6**
Tasks:
    A. Punctuating the script after listening to it.
    B. Marking word chunks/tone groups in transcript after listening to it.
    C. Marking syllable stress in words.
    D. Identifying tonal variations expressing rhetorical questions/ information seeking Questions / Exclamations / General statements.

UNIT III Content Comprehension and Making Inferences   **12**
Tasks:
    A. Listening and filling in the chart
    B. Multiple choice questions (Negative/factual)
    C. True/False questions
    D. Questions with multiple answers (choosing two/three correct answers)
    E. Matching information
    F. Filling the blanks (not more than three words)
    G. Comprehending the text organization

UNIT IV Listening and act   **8**
Tasks:
    A. Locating spots in a map following the given directions
    B. Transferring data to graphs/diagrams/flow charts
    C. Diagram/Picture completing tasks
    D. Finding the answer through the process of elimination

TOTAL: 30 PERIODS

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BMA301   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 Differential Equations. This will be necessary for their effective studies in a large number of engineering subjects like heat conduction, communication systems, electro-optics and electromagnetic theory. The course will also serve as a prerequisite for post graduate and specialized studies and research.

UNIT I   FOURIER SERIES   (9L+3T)

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 identity – Harmonic analysis.

UNIT II   FOURIER TRANSFORMS   (9L+3T)

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   (9L+3T)

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   (9L+3T)

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   (9L+3T)

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*", 7th 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*", 3rd Edition, Pearson Education (2007).
4. Erwin Kreyszig, "*Advanced Engineering Mathematics*", 8th edition, Wiley India (2007).

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Curriculum & Syllabus for B.Tech. (IT)   **Regulations-2011**

BCE301   **ENVIRONMENTAL SCIENCE AND ENGINEERING**   **L T P C**
(Common to 3rd Sem – Civil, CSE, IT, EEE and EIE   **3 0 0 3**
5th Sem – Mechanical, 7th Sem - ECE)

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 – soil 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

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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 nongovernmental 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 production 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

TEXT BOOKS:
1. Gilbert M.Masters, "Introduction to Environmental Engineering and Science", 2nd Edition, Pearson Education, 2008.
2. Benny Joseph, "Environmental Science and Engineering", Tata McGraw-Hill, New Delhi, 2006.

REFERENCES:
1. R.K. Trivedi, "Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards", Vol. I and II, Enviro Media, BS Publications, 2004.
2. Cunningham, W.P. Cooper, T.H. Gorhani, "Environmental Encyclopedia", Jaico Publishing House, Mumbai, 2001.
3. Dharmendra S. Sengar, "Environmental law", Prentice Hall of India (P) Ltd., New Delhi, 2007.
4. Rajagopalan R, "Environmental Studies-From Crisis to Cure", Oxford University Press, 2005.

BIT301   **DATA STRUCTURES AND ALGORITHMS USING C**   **L T P C**
                                                                                 3 0 0 3

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: 45

TEXT BOOK
1. M. A.Weiss, "Data Structures and Algorithm Analysis in C", 2nd Edition, Pearson Education, 1997.

REFERENCES
1. A.V. Aho, J. E. Hopcroft, and J. D. Ullman, "Data Structures and Algorithms", Pearson Education, 1983.
2. R.F. Gilberg, B. A. Forouzan, "Data Structures", 2nd 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", 3rd Edition, Pearson Education, 2000.
6. T.H. Cormen, C. E. Leiserson, R. L. Rivest, and C. Stein, "Introduction to algorithms" 2nd Edition, Prentice Hall of India Ltd.

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BEI303   **DIGITAL PRINCIPLES AND SYSTEM DESIGN**   **L T P C**
                              (Common to CSE & IT)   **3 1 0 4**

UNIT I   BOOLEAN ALGEBRA AND LOGIC GATES   8+**3**
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 – Implementation of Boolean functions using logic gates.

UNIT II   COMBINATIONAL LOGIC   9+**3**
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+**3**
Decoders and encoders – Multiplexers and demultiplexers – Memory and programmable logic – HDL for combinational circuits

UNIT IV   SYNCHRONOUS SEQUENTIAL LOGIC   10+**3**
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+**3**
Analysis and design of asynchronous sequential circuits - Reduction of state and flow tables – Race-free state assignment – Hazards – ASM Chart.

LECTURE: 45 TUTORIAL: 15 TOTAL: 60

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

REFERENCES
  1. Charles H.Roth Jr., "Fundamentals of Logic Design", 5th Edition, Jaico Publishing House, 2005.
  2. Donald D.Givone, "Digital Principles and Design", Tata McGraw-Hill, 2007.

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BCS302   OBJECT ORIENTED PROGRAMMING   L T P C
                (Common to 3rd Sem – CSE & IT,   3 0 0 3
                5th Sem – EIE, 6th Sem – EEE)

UNIT I   BASICS OF OBJECT – ORIENTED PROGRAMMING   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   CONSTRUCTORS AND FUNCTION OVERLOADING   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   TEMPLATES AND EXCEPTION HANDLING   9
Function and class templates – Exception handling – try-catch-throw paradigm – exception specification – terminate and unexpected functions – Uncaught exception.

UNIT IV   INHERITANCE   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   I/O STREAMS   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

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

REFERENCES
1. Ira Pohl, "Object Oriented Programming using C++", 2nd Edition, Pearson Education, Reprint 2004.
2. S. B. Lippman, Josee Lajoie, Barbara E. Moo, "C++ Primer", 4th Edition, Pearson Education, 2005.
3. B. Stroustrup, "The C++ Programming language", 3rd Edition, Pearson Education, 2004.

BIT302   **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.

UNITV   SATELLITE AND OPTICALCOMMUNICATION   9
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.

Lectures: 45 Tutorials: 15 Total: 60

TEXT BOOKS
1. Wayne Tomasi, "Advanced Electronic Communication Systems", 6th Edition, 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" 3rd Edition, 2007.
2. B.P.Lathi, "Modern Analog And Digital Communication systems", 3rd Edition, 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" 2nd Edition Pearson Education 2007.

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Curriculum & Syllabus for B.Tech. (IT)   **Regulations-2011**

BEI332   **DIGITAL LABORAOTRY**   **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)

                                                                        TOTAL: 45

List of equipments and components for a batch of 30 students

S.NO	Name of equipment/ component	Quantity Req	Remarks
1	Dual power supply/ single mode power supply	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		Single Strand

BIT331   DATA STRUCTURES AND ALGORITHMS USING C   L T P C
                          LABORAOTRY   **0 0 3 2**

OBJECTIVE

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

LIST OF EXPERIMENTS

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: 45

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

1. SOFTWARE REQUIRED   - **TURBOC version 3 or GCC version 3.3.4**.
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 hard disk)

BCS332   OBJECT ORIENTED PROGRAMMING LABORATORY   L T P C
                (Common to 3rd Sem – CSE & IT, 5th Sem – EIE, 6th Sem – EEE)   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 overloading 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).

TOTAL: 45

LIST OF EQUIPMENTS AND SOFTWARE FOR A BATCH OF 30 STUDENTS

HARDWARE:
- 30 Personal Computers
- Processor – 2.0 GHz or higher
- RAM – 256 MB or higher
- Hard disk – 20 GB or higher

SOFTWARE:
- Turbo C (freeware) – to be installed in all PC's.
- OS - Windows 2000/ Windows XP/ NT

National Engineering College (An Autonomous Institution, Affiliated to Anna University, Chennai), K.R.Nagar, Kovilpatti

Curriculum & Syllabus for B.Tech. (IT)   **Regulations-2011**

BEG331   COMMUNICATION SKILLS AND TECHNICAL SEMINAR – I   L T P C
(Common to all branches)   0 0 3 2
(To be conducted as a Practical Paper by the Dept of English for 3 hrs per week)

OBJECTIVES
- To improve the learners' oral fluency in English
- To help the learners acquire the readiness to speak in English
- To develop the sub-skills required for paper presentations and group discussions
- To help the learners improve their vocabulary related to specific fields of technology
- To facilitate the development of the learners' proficiency in meaningful interaction
- To provide them linguistic support for managing vital sub-functions of Communication

COURSE CONTENT:
A) Phonetic practice (7 hrs)
- English phonemes with special emphasis on the diphthongs
- Stress patterns for words that end with specific suffixes.
  ('ion' , 'ic' 'ical' 'ious','ate' , 'ise/-ize', 'fy', 'logy', 'ity')

B) Speech practice (8 hrs)
- Speaking on the themes by developing the hints provided.
  The themes are:
    1. Cloning
    2. Artificial satellites
    3. Renewable sources
    4. Telecommunication
    5. Cyber Revolution
    6. Space research
    7. Polythene pollution
    8. Fossil fuels
    9. Climate change
    10. Ecological threats
    11. Water resources
    12. Nuclear technology
    13. Scientific farming
    14. Thermal power plants
    15. Natural calamities
    16. Robotics
    17. Artificial intelligence
    18. Role of Fibre Optics
    19. Exploration of Mars
    20. Gas turbines

C) Group Quiz on technical aspects related to the themes (4hrs)

D) Language Functions (8 hrs)
1. comparing and contrast
2. reporting the conversation of others.
3. talking about future plans and intentions
4. giving reasons
5. expressing preferences
6. quantifying
7. expressing certainty and uncertainty
8. expressing opinions and impressions
9. making suggestions

10. expressing assumptions
11. evaluating options
12. hypothesing/deducing
13. defending a point of view

E) Seminar presentation on the themes allotted (18 hrs)
PROCEDURE:
A) Phonetic practice
All the speech sounds should be taught .The learners should be given drills in the pronunciation of at least 30 words for each sound. While practicing stress patterns, they should be encouraged to identify as many words as possible for each suffix endings.

B) Speech practice
Every student should be allowed to choose one theme to specialize in. (However not more than 4 students in a section can choose the same theme).The teacher has to prepare at least 4 hints development tasks on each theme and should provide chance to each learner to speak on those hints related to his/ her theme (5 minutes).The hints may be supplied to the students in advance. When a student speaks, the class should be encouraged to ask questions as well as note down the words related to the different fields.

C) Group Quiz on technical phrases related to the themes.
The class should be divided into groups that specialize on a particular theme. Each group should conduct a quiz (question & answer session) which will be answered by the other groups.

D) Language Functions
The teacher should build micro activities to develop the use of language required to handle these sub-functions of communication. In the process, the learners should get used to the linguistic elements needed for these functions.

E) Seminar presentation on the themes allotted
Each student should collect materials from books, journals and newspapers for his/her theme and prepare a short seminar paper. The presentation should be for 10 minutes. It should be followed 'open house' during which others should come forward to question, clarify, supplement or evaluate.

RECORD LAY OUT:
Every student has to maintain a record in which he/she has to incorporate the following details.
- First page containing learner details and the topic of specialization.
- Twenty words for each phoneme
- Twenty words with stress marks for each suffix ending
- Vocabulary list (technical words and compound words) related to the 20 themes identified for this semester.
- Three news paper items, two journal items and three internet sources related to the special theme selected by the student.(To be pasted on the pages)
- The Quiz questions of the group with expected answers.
- The seminar paper presented by the learner with details about the open house.
- Notes of observation. (Details about any three seminar paper presentations by others)
- The record should be duly signed by the course teacher and submitted to the External Examiner for verification during the semester practicals.

P = 45 Total = 45

BIT401   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

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. Ltd., 2007.

BCS402   MICROPROCESSORS AND MICROCONTROLLERS   L T P C
                        (Common to CSE & IT)   **3 0 0 3**

UNIT I   8085 MICROPROCESSORS   9
8085 Microprocessor architecture – Addressing modes – Instruction set – Programming the 8085.

UNIT II   8086 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 – Architecture – Data Types – 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 and DAC.

TOTAL: 45

TEXT BOOKS
1. Ramesh S. Gaonkar, "Microprocessor – Architecture, Programming and Applications with the 8085", 5th Edition, Penram International Publisher, 2006.
2. Yu-cheng Liu, Glenn A.Gibson, "Microcomputer systems: The 8086 / 8088 Family architecture, Programming and Design", 2nd Edition, Prentice Hall of India, 2006.
3. Kenneth J.Ayala, "The 8051 Microcontroller Architecture, Programming and Applications", 2nd Edition, Penram International Publisher, 2004.

REFERENCES
1. Douglas V.Hall, "Microprocessors and Interfacing: Programming and Hardware", 2nd Edition, Tata McGraw Hill, 2006.
2. A.K.Ray and 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", 5th Edition, Prentice Hall of India pvt. Ltd, 2007.
4. Mohamed Ali Mazidi, Janice Gillispie Mazidi, "The 8051 Microcontroller and embedded systems: using Assembly and C", 2nd Edition, Pearson Education, 2007.

BCS403	COMPUTER ORGANIZATION AND ARCHITECTURE	L T P C
	(Common to CSE & IT)	3 1 0 4

UNIT I   BASIC STRUCTURE OF COMPUTERS   12

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   12

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

UNIT III   PIPELINING   12

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

UNIT IV   MEMORY SYSTEM   12

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   12

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.

LECTURE: 45 TUTORIAL: 15 TOTAL: 60

TEXT BOOK
1. Carl Hamacher, Zvonko Vranesic and Safwat Zaky, "Computer Organization", 5th Edition, Tata McGraw Hill, 2002.

REFERENCES:
1. David A. Patterson and John L. Hennessy, "Computer Organization and Design: The Hardware/Software interface", 3rd Edition, Elsevier, 2005.
2. William Stallings, "Computer Organization and Architecture – Designing for Performance", 6th Edition, Pearson Education, 2003.
3. John P. Hayes, "Computer Architecture and Organization", 3rd Edition, Tata McGraw- Hill, 1998.
4. V.P. Heuring, H.F. Jordan, "Computer Systems Design and Architecture", 2nd Edition, Pearson Education, 2004.

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BMA402	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. Queueing 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 fundamental knowledge of the basic probability concepts.
- 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 queueing system and acquire skills in analyzing queueing models.

UNIT I   RANDOM VARIABLES   (9L+3T)

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   (9L+3T)

Joint distributions - Marginal and conditional distributions – Covariance - Correlation and regression - Transformation of random variables - Central limit theorem.

UNIT III   MARKOV PROCESSES AND MARKOV CHAINS   (9L+3T)

Classification - Stationary process - Markov process - Markov chains – Transition probabilities - Limiting distributions - Poisson process

UNIT IV   QUEUEING THEORY   (9L+3T)

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

UNIT V   NON-MARKOVIAN QUEUES AND QUEUE NETWORKS   (9L+3T)

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

Lectures: 45   Tutorials: 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.

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Curriculum & Syllabus for B.Tech. (IT)   Regulations-2011

BCS404   **OPERATING SYSTEMS**   **L T P C**
                              (Common to 4th Sem - CSE& IT, 6th Sem - ECE)   **3 0 0 3**

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.

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
TEXT BOOK
   1. Silberschatz, Galvin, and Gagne, "Operating System Concepts", 6th Edition, Wiley India Pvt Ltd, 2003.

REFERENCES
   1. Andrew S. Tanenbaum, "Modern Operating Systems", 2nd Edition, Pearson Education, 2004.
   2. Gary Nutt, "Operating Systems", 3rd Edition, Pearson Education, 2004.
   3. Harvey M. Deital, "Operating Systems", 3rd Edition, Pearson Education, 2004.

BCS405	**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

TEXT BOOKS
1. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, "Database System Concepts", 5th Edition, Tata McGraw Hill, 2006. (For Unit I and Unit-V)
2. C.J.Date, A.Kannan, S.Swamynathan, "An Introduction to Database Systems", 8th Edition, Pearson Education, 2006.(For Unit II, III and IV)

REFERENCES
1. Ramez Elmasri, Shamkant B. Navathe, "Fundamentals of Database Systems", 4th Edition, Pearson / Addision wesley, 2007.
2. Raghu Ramakrishnan, "Database Management Systems", 3rd Edition, Tata McGraw-Hill, 2003.
3. S.K.Singh, "Database Systems Concepts, Design and Applications", 1st Edition, Pearson Education, 2006.

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Curriculum & Syllabus for B.Tech. (IT)   **Regulations-2011**

BCS431	OPERATING SYSTEMS LABORATORY	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: 45

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.

BCS432	**DATABASE MANAGEMENT SYSTEMS LABORATORY**	**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).

TOTAL: 45

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.

BCS433   **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

LIST OF EQUIPMENTS/COMPONENTS FOR 30 STUDENTS (2 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.

BEG431   COMMUNICATION SKILLS AND TECHNICAL SEMINAR – II   L T P C
(Common to all branches*)*   **0 0 3 2
(To be conducted as a Practical Paper by the Dept of English for 3 hrs per week)

OBJECTIVES
1. To improve the learners' oral fluency in English
2. To help the learners acquire the readiness to speak in English
3. To develop the sub-skills required for paper presentations and group discussions
4. To help the learners improve their vocabulary related to specific fields of technology
5. To facilitate the development of the learners' proficiency in meaningful interaction
6. To provide them linguistic support for managing vital sub-functions of communication.

COURSE CONTENT:
A) Phonetic practice (7 hrs)
All the English phonemes with special emphasis on the following
1. /ae/ and /ei/
2. /e/ and /i/
3. First syllable and second syllable stress
4. Three different ways of pronouncing 'ed' past tense endings eg. *'played', 'walked', 'wanted'*
5. Correct pronunciation of commonly used words (A list of 1000 words will be suggested by the university)
6. Silent letters

B) Speech practice (8 hrs)
Speaking on the themes by developing the hints provided.
The themes are:
1. Indian space missions
2. Converting agricultural wastes for useful purposes
3. Developments in transportation
4. Technology and agriculture
5. Impact of global warming
6. Desalination of water
7. Technology for national security
8. Industrial development and ecological issues
9. Applications of nano technology
10. Hazards of e-waste

C) Preparation of power point frames on the given topic (2 hrs)
(Only pictures, graphs, equations should be given through power point and not the text of the presentation as such)

D) Language Functions (14 hrs)
Reporting the conversation of others
Using the third conditional
Expressing agreement and disagreement
Numerical expressions
Describing manner and frequency
Evaluating different standpoints
Developing an argument
Describing daily routines, events, and weather

E) Seminar presentation on the themes allotted using power point frames (14 hrs)
PROCEDURE:
A) Phonetic practice
The learners should be given drills in the pronunciation of at least 30 words for each sound. While practicing stress patterns, they should be encouraged to identify as many words as possible for each pattern.

B) Speech practice
Every student should be allowed to choose one theme to specialize in. (However not more than 7 students in a section can choose the same theme).The teacher has to prepare at least 4 hints development tasks on each theme and should provide chance to each learner to speak on those hints related to his/ her theme (5 minutes).The hints may be supplied to the students in advance. When a student speaks, the class should be encouraged to ask questions as well as note down the words related to the different fields.

C) Language Functions
The teacher should build micro activities to develop the use of language required to handle these sub-functions of communication. In the process, the learners should get used to the linguistic elements needed for these functions.

D) Seminar presentation on the themes allotted
Each student should collect materials from books, journals and newspapers for his/her theme and prepare a short seminar paper. The presentation should be for 10 minutes using power point frames. It should be followed by an 'open house' during which others should come forward to question, clarify, supplement or evaluate.

RECORD LAY OUT:
Every student has to maintain a record in which he/she has to incorporate the following details.

- First page containing learner details and the topic of specialization.
- Twenty words for each phoneme /ae/, /ei/, /i/ and /e/
- Fifty words with first syllable stress and fifty for second syllable stress (The learner will be required to pronounce some of these words during the practical exam)
- Vocabulary list (technical words and compound words) related to the 10 themes identified for this semester.
- Three newspaper items, two journal items and three internet sources related to the special theme selected by the student.(To be pasted on the pages)
- The seminar paper presented by the learner with a soft copy of the power point frames.
- Notes of observation. (Details about any two seminar paper presentations by others)
- The record should be duly signed by the course teacher and submitted to the External Examiner for verification during the semester practicals.

P = 45 Total = 45

BIT501   **SYSTEM SOFTWARE**   **L T P C**
                                                                           3 1 0 4

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 and SIC/XE) - Machine architecture - Data and instruction formats - Addressing modes - Instruction sets – Input and Output – SIC and SIC/XE Programming examples

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

                                                     TUTORIAL: 15
                                                     TOTAL: 60
TEXT BOOK
1. Leland L. Beck, "System Software – An Introduction to Systems Programming", 3rd Edition, Pearson Education Asia, 2000

REFERENCES
1. D. M. Dhamdhere, "System Programming", Tata McGraw-Hill, 2011.

BIT502   PRINCIPLES OF 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   INTRODUCTION   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   DOMAIN MODELS AND CLASS RELATIONS   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   LOGICAL ARCHITECTURE AND SSD   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   DESIGNINING OBJECTS WITH RESPONSIBILITIES   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   OPERATION CONTRACTS   9
UML state diagrams and modeling - Operation contracts- Mapping design to code –UML deployment and component diagrams

TOTAL: 45

TEXT BOOK
1. Craig Larman, "Applying UML and Patterns: An Introduction to Object Oriented Analysis and Design and iterative development", 3rd 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", 2nd 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.

BCS502   **COMPUTER NETWORKS**   **L   T   P   C**
                              (Common to CSE & IT)   **3   0   0   3**

OBJECTIVES
- To study the concepts of communications and network architecture.
- To understand the network classifications and design principles.
- To study about the switching concepts and routing protocols.
- To learn about the various layering protocols.

UNIT I   INTRODUCTION   9
Communication model - Data communications networking - Data transmission concepts and terminology - Transmission media - Data encoding - Data link control.

UNIT II   NETWORK FUNDAMENTALS   9
Protocol architecture - Protocols - OSI - TCP/IP - LAN architecture - Topologies - MAC - Ethernet, Fast Ethernet, Token ring, FDDI, Wireless LANs - Bridges.

UNIT III   NETWORK LAYER   9
Network layer - Switching concepts - Circuit switching networks - Packet switching - Routing - Congestion control - X.25 - Internetworking concepts and X.25 architectural models - IP - Unreliable connectionless delivery - Datagram - Routing IP datagram - ICMP.

UNIT IV   TRANSPORT LAYER   9
Transport layer - Reliable delivery service - Congestion control - Connection establishment - Flow control - Transmission control protocol - User datagram protocol.

UNIT V   APPLICATION LAYER   9
Applications - Sessions and presentation aspects - DNS, Telnet - rlogin - FTP - SMTP - WWW - Security - SNMP.

                                                                    TOTAL: 45
TEXT BOOKS
1. Larry L. Peterson, Bruce S. Davie, "Computer Networks: A Systems Approach", 4th Edition, Morgan Kauffmann Publishers Inc., 2007.
2. William Stallings, "Data and Computer Communications", 8th Edition, Pearson Education, 2007.

REFERENCES
1. James F. Kuross, Keith W. Ross, "Computer Networking, a Top-Down Approach Featuring the Internet", 3rd Edition, Addison Wesley, 2004.
2. Nader F. Mir, "Computer and Communication Networks", Pearson Education, 2007.
3. Comer, "Computer Networks and Internets with Internet Applications", 4th Edition, Pearson Education, 2003.
4. Andrew S. Tanenbaum, "Computer Networks", 4th Edition, Prentice Hall PTR, 2003.

BCS503   **THEORY OF COMPUTATION**   **L   T   P   C**
                          (Common to CSE & IT)   **3   1   0   4**

OBJECTIVES
- To have an understanding of finite state and pushdown automata.
- To have a knowledge of regular languages and context free languages.
- To know the relation between regular language, context free language and corresponding recognizers.

UNIT I   AUTOMATA   7+3
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   10+3
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   10+3
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+3
Normal forms for CFG - Pumping Lemma for CFL - Closure Properties of CFL – Turing Machines - Programming Techniques for TM.

UNIT V   UNDECIDABALITY   9+3
A language that is not Recursively Enumerable (RE) - An un-decidable problem that is RE- Un-decidable problems about Turing Machine - Post's Correspondence Problem - The classes P and NP.

                                                                    TOTAL: 60

TEXT BOOK
1. J.E. Hopcroft, R. Motwani and J.D. Ullman, "Introduction to Automata Theory, Languages and Computations", 2nd Edition, Pearson Education, 2007.

REFERENCES
1. Thomas A. Sudkamp, "An Introduction to the Theory of Computer Science, Languages and Machines", 3rd Edition, Pearson Education, 2007.
2. J. Martin, "Introduction to Languages and the Theory of computation", 3rd Edition, Tata McGraw Hill, 2007.
3. H.R. Lewis, C.H. Papadimitriou, "Elements of the theory of Computation", 2nd Edition, Pearson Education, 2003.
4. Raymond Greenlaw, H.James Hoover, "Fundamentals of Theory of Computation, Principles and Practice", Morgan Kaufmann Publishers, 1998.
5. Micheal Sipser, "Introduction of the Theory and Computation", Thomson Brokecole, 1997.

BCS005 **C# AND .NET TECHNOLOGIES** **L T P C**
                    (Common to CSE & IT) **3 0 0 3**

OBJECTIVES
- To provide an awareness of the .NET Environment.
- To deliver C# program based on the Microsoft .Net Framework including console applications and class libraries.
- To study about the applications of XML in .NET and ADO.NET.

UNIT I   OVERVIEW OF .NET   9
Building blocks of .Net platform – Type system - Language specification - Type distinction – Runtime deployment - .Net aware programming languages.

UNIT II   CONCEPTS OF C#   9
Data types – this keyword - Inheritance - Namespace - Polymorphism - Interface and Overloading - Multiple Inheritance - Property - Indexes - Delegates - Events - Operator Overloading -Method Overloading – Exception handling.

UNIT III   FILE I/O AND OBJECTS   9
Name spaces – Directory and file types – Programming with file I/O – Object serialization – Configuration of objects – Serialization mechanisms.

UNIT IV   ADO .NET   9
ADO.NET Architecture - ADO.NET Connected and Disconnected layers – Entity frame work – Introducing LINQ to XML.

UNIT V   ASP.NET   9
Building ASP.NET web pages – ASP.NET web controls – Master pages – Themes – State management: Session data - Cookies.

                                                                  TOTAL: 45

TEXT BOOKS
1. Andrew Troelsen, "Pro C# 2010 and the .NET 4 Platform", 5th Edition, A Press, 2010.
2. Stephen C. Perry, "Core C# and .NET", Pearson Education, 2006.
3. S.Thamarai Selvi and R. Murugesan, "A Textbook on C#", Pearson Education, 2003.

REFERENCES
1 Jesse Liberty and Donald Xie, "Programming C# 3.0", 5th Edition, O'Reilly Press, 2008.
2 Robinson et al, "Professional C#", 5th Edition, Wrox Press, 2002.
3 Herbert Schildt, "The Complete Reference: C#", Tata McGraw Hill, 2004.
4 Andrew Troelsen, "C# and the .NET Platform", APress, 2003.
5 Thuan Thai, Hoang Q. Lam, "**.**NET Framework Essentials", 2nd Edition, O'Reilly Press, 2002.

BGE501   **PROFESSIONAL ETHICS AND HUMAN VALUES**   **L   T   P   C**

(Common to 5th Sem – EEE, EIE, Civil & IT   **3   0   0   3**

6th Sem – CSE & ECE)

OBJECTIVES:
- To create awareness on Engineering Ethics and Human Values.
- To instill Moral and Social Values and Loyalty
- To appreciate the rights of others

UNIT I   HUMAN VALUES   10
Morals, Values and Ethics – Integrity – Work Ethic – Service Learning – Civic Virtue – Respect for Others – Living Peacefully – Caring – Sharing – Honesty – Courage – Valuing Time – Co-operation – Commitment – Empathy – Self-Confidence – Character – Spirituality

UNIT II   ENGINEERING ETHICS   9
Senses of 'Engineering Ethics' - variety of moral issued - types of inquiry - moral dilemmas - moral autonomy - Kohlberg's theory - Gilligan's theory - consensus and controversy – Models of Professional Roles - theories about right action - Self-interest - customs and religion - uses of ethical theories.

UNIT III   ENGINEERING AS SOCIAL EXPERIMENTATION   9
Engineering as experimentation - engineers as responsible experimenters - codes of ethics - a balanced outlook on law - the challenger case study

UNIT IV   SAFETY, RESPONSIBILITIES AND RIGHTS   9
Safety and risk - assessment of safety and risk - risk benefit analysis and reducing risk - the three mile island and chernobyl case studies - Collegiality and loyalty - respect for authority - collective bargaining - confidentiality - conflicts of interest - occupational crime - professional rights - employee rights - Intellectual Property Rights (IPR) - discrimination.

UNIT V   GLOBAL ISSUES   8
Multinational corporations - Environmental ethics - computer ethics - weapons development - engineers as managers-consulting engineers-engineers as expert witnesses and advisors -Moral leadership - sample code of Ethics like ASME, ASCE, IEEE, Institution of Engineers (India), Indian Institute of Materials Management, Institution of electronics and telecommunication engineers (IETE),India, etc.

                                                                                        TOTAL: 45

TEXT BOOKS
1. Mike Martin and Roland Schinzinger, "Ethics in Engineering", McGraw-Hill, New York 1996.
2. Govindarajan M, Natarajan S, Senthil Kumar V. S, "Engineering Ethics", Prentice Hall of India, New Delhi, 2004.

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

BIT531   **SYSTEM SOFTWARE LABORATORY**   **L T P C**
                                                            0 0 3 2

*(***Using C or 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 macro processor.
6. Implement an absolute loader.
7. Implement a relocating loader.
8. Implement pass one of a direct-linking loader.
9. Implement pass two of a direct-linking loader.
10. Implement a simple text editor with features like insertion / deletion of a character, word, and sentence.

BIT532   **CASE TOOLS LABORATORY**   **L T P C**
                                                                  0 0 3 2

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. Identify 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 SoftwareTools

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

BIT601   NETWORK PROGRAMMING AND NETWORK MANAGEMENT   L T P C
                                                                                                         3 0 0 3

OBJECTIVES
- To learn the basics of socket programming using TCP Sockets.
- To learn basics of UDP sockets.
- To develop knowledge of threads for developing high performance scalable applications.
- To learn about raw sockets.
- To understand simple network management protocols & practical issues.

UNIT I   NETWORKING & TCP/IP   9
Communication protocols, Network architecture, UUCP, XNS, IPX/SPX for LANs, TCP & IP headers, IPv4 & v6 address structures, Programming Applications: Time & date routines, Internet protocols: Application layer, Transport layer, Network layer, Datalink layer protocols, Chat, Email, Web server working method & programming.

UNIT II   SOCKET PROGRAMMING   9
Creating sockets, POSIX data type, Socket addresses, Assigning address to a socket, Java socket programming, Thread programming, Berkeley Sockets: Overview, socket address structures, byte manipulation & address conversion functions, elementary socket system calls, socket, connect, bind, listen, accept, fork, exec, close, TCP ports (ephemeral, reserved), Berkeley Sockets: I/O asynchronous & multiplexing models, select & poll functions, signal & fcntl functions, socket implementation (client & server programs), UNIX domain protocols.

UNIT III   SOCKET OPTIONS, ELEMENTARY UDP SOCKETS   9
Socket options – getsocket and setsocket functions – generic socket options – IP socket options – TCP socket options – Elementary UDP sockets – UDP echo Server – UDP echo Client –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 – raw sockets – raw socket creation – raw socket output – raw socket input – ping program – trace route program.

UNIT V   NETWORK MANAGEMENT   9
Introduction – Network Management Requirements – Network Management Systems – Network monitoring – Network Control – SNMP v1 – RMON – Element Network Management
                                                                                                         TOTAL : 45

TEXT BOOKS:
1. W. Richard Stevens, "Unix Network Programming Vol-I", 2nd Edition, Pearson Education, 1998.
2. William Stallings, "SNMP, SNMPv2, SNMPv3 and RMON 1 and 2", 3rd Edition, Addison Wesley, 1999.

REFERENCES:
1. D.E. Comer, "Internetworking with TCP/IP Vol- III", (BSD Sockets Version), 2nd Edition, Pearson Education, 2003.
2. W. Richard Stevens, "Unix Network Programming" PHI Learning Private Limited, 2009.
3. Mani Subramaniam, "Network Management: Principles and Practice", Addison Wesley", 1st Edition, 2001.

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Curriculum & Syllabus for B.Tech. (IT)   **Regulations-2011**

BIT602   **DIGITAL SIGNAL PROCESSING**   **L T P C**
                                                                        3 1 0 4

OBJECTIVES
- Understand the basic concepts of discrete-time signal processing and systems necessary for the design and analysis of advanced signal processing technologies.
- Understand the concept of frequency in continuous-time and discrete-time signals.
- Understand the basic operations that are involved in analog-to-digital and digital-to analog converters.
- Understand the basic principles of the sampling theorem, how the aliasing errors can be avoided, and the effects of quantization noise.
- Understand the basic operations that can be performed on digital signals and systems, and the fundamental concepts of linear time-invariance (LTI), stability, causality, and difference equation.

UNIT I   SIGNALS AND SYSTEMS   9
Basic Elements of Digital Signal Processing – Concept of Frequency in Continuous Time and Discrete Time Signals –Sampling Theorem – Discrete Time Signals – Discrete Time Systems – Analysis of Linear Time Invariant Systems – Z-Transform – Convolution and Correlation.

UNIT II   FREQUENCY TRANSFORMATIONS   9
Introduction to DFT – Efficient Computation of DFT – Properties of DFT –Filtering Methods Based on DFT– FFT Algorithms – Radix-2 FFT Algorithms – Decimation in Time – Decimation in Frequency– Use of FFT Algorithms in Linear Filtering and Correlation.

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- filter design using frequency translation

UNIT IV   FIR FILTER DESIGN   9
Symmetric and Antisymmteric FIR Filters – Linear Phase Filter – Windowing Technique – Rectangular– Kaiser Windows– Frequency Sampling Techniques – Structure for FIR Systems.

UNIT V   APPLICATIONS   9
Multirate signal processing – Speech compression – Adaptive filter – Musical sound processing - Image Processing

                                                         TUTORIAL: 15
                                                         TOTAL: 60

TEXT BOOKS
1. John G. Proakis & Dimitris G.Manolakis, "Digital Signal Processing – Principles, Algorithms & Applications", 4th Edition, Pearson education / Prentice Hall, 2007.
2. Sanjit K Mitra, "Digital Signal Processing - A Computer Based Approach", 3rd Edition, Tata McGraw-Hill Publishing Co. Pvt., Ltd., New Delhi, 2008
3. Emmanuel C..Ifeachor, & Barrie.W.Jervis, "Digital Signal Processing", 2nd Edition, Pearson Education, Prentice Hall, 2002.

REFERENCES
1. Alan V.Oppenheim, Ronald W. Schafer & Hohn. R.Back, "Discrete Time Signal Processing", Pearson Education,1998
2. Andreas Antoniou, "Digital Signal Processing", Tata McGraw Hill, 2006

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Curriculum & Syllabus for B.Tech. (IT)   **Regulations-2011**

BIT603   **PRINCIPLES OF COMPILER DESIGN**   **L T P C**

                                                                                    3 0 0 3

OBJECTIVES:
- To understand, design and implement a lexical analyzer
- To understand, design and implement a parser
- To understand, design code generation schemes
- To understand optimization of codes and runtime environment

**UNIT I   OVERVIEW OF COMPUTER HARDWARE, SYSTEM SOFTWARE
                     AND COMPILER   9**

Introduction - Computer Hardware and types of System Software - Man-machine communication spectrum - Introduction to Compilers - Theory of computer languages - Design of language - Evolution of compilers - Stages of compilation

UNIT II   LEXICAL ANALYSIS   9

Introduction - Alphabets and tokens in computer languages - Representation of tokens and regular expression - Token reorganization and finite state automata – Implementation - Error recovery

UNIT III   SYNTAX ANALYSIS   9

Introduction - Context-free grammar and structure of language - Parser and its types - Top-down parser - Bottom-up parser – Implementation - Parser generator tool (Yacc) - Error handling

**UNIT IV   RUN-TIME   STORAGE   ORGANIZATION   AND   INTERMEDIATE
                     CODE GENERATION   9**

Run-time storage organization: Introduction - Scope and lifetime of variables - Symbol table - Storage allocation - Access to non-local names from stack - Heap allocation - Garbage collection
Intermediate code generation: Introduction - Need for Intermediate code - Types of Intermediate code - Representation of all language constructs by three-address code - Grammar symbols and attributes - Semantic analysis - Semantic routines for intermediate code generation

UNIT V   OPTIMIZATION AND CODE GENERATION   9

Optimization: Introduction - Hints on writing optimized code at user level - Construction of basic blocks and processing - Data-flow analysis using flow graph - Data-flow equations for blocks with backward flow control - Principal sources of optimization and transformations –Alias - procedural optimization - Loops in flow graph - Loop optimization
Code generation: Introduction - Issues in Code generation - Target machine architecture, Subsequent use information - Simple Code generator - Register allocation - Directed Acyclic Graph representation of basic blocks - Code generation from intermediate code - Peephole optimization - Code scheduling

                                                                              TOTAL : 45

TEXT BOOK:
1. K.Muneeswaran, "Compiler Design", Oxford University Press 2013.

REFERENCE BOOKS:
1. Alfred Aho, Monica S.Lam, Ravi Sethi and Jeffrey D.Ullman, "Compiler Principles, Techniques and Tools", 2nd Edition, Addison Wesley 2006.
2. Steven S.Muchnick, "Advanced Compiler Design Implementation", Morgan Kaufmann, 2003.

BIT604   **EMBEDDED SYSTEMS**   **L T P C**
                                                                            3 0 0 3

OBJECTIVES

- To introduce students to the embedded systems, its hardware and software.
- To introduce ARM processor and Instruction set.
- To explain memory system mechanisms
- To explain programming concepts and embedded programming in C and C++.
- To motivate the students with complete design of embedded system

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 – Inter process 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 : 45
TEXT BOOKS:
1. Marilyn Wolf, "Computers as Components: Principles of Embedded Computing System Design", 3rd Edition, Elsevier, 2012.
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, 2nd Edition, 2007.
3. Embedded Systems Architecture – Tammy Noergaard, Elsevier, 2005.

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Curriculum & Syllabus for B.Tech. (IT)   **Regulations-2011**

BIT605   OBJECT ORIENTED PROGRAMMING USING JAVA   L T P C

3 1 0 4

OBJECTIVE:

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

UNIT I   FUNDAMENTALS   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   FEATURES   10

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

UNIT III   STREAMS AND GRAPHICS PROGRAMMING   10

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

UNIT IV   EVENT HANDLING AND EXCEPTIONS   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   GENERIC AND MULTITHREADED PROGRAMMING   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.

TUTORIAL : 15

TOTAL: 60

TEXT BOOK

1. Cay S. Horstmann and Gary Cornell, "Core Java: Volume I – Fundamentals", 8th Edition, Sun Microsystems Press, 2008.

REFERENCES

1. K. Arnold and J. Gosling, "The JAVA programming language", 3rd 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", 4th Edition, Tata McGraw-Hill Publishing company Ltd., 2006.

BIT631   **NETWORK PROGRAMMING LABORATORY**   **L T P C**
                                (Using C & Java)   **0 0 3 2**

1. Program for creation of TCP & UDP Sockets.
2. Programs using TCP Sockets (like date and time server & client, echo server & client, etc..)
3. Programs using UDP Sockets (like echo Server & client, simple DNS)
4. Implementation of Chat server program with multiple clients.
5. Implementation of ARP/RARP Protocol.
6. Implementation of FTP protocol.
7. Simulation of Sliding Window Protocols
8. Design a RPC application to add and subtract a given pair of integers.
9. Write a program to implement alarm clock using,
                a) APPLET   B) Application
10. Configure a Network using Distance vector Routing protocol with packet tracer software.
11. Configure a Network using Link State Vector Routing Protocol with packet tracer software.
12. Connect the Computers in Local Area Networks.

BIT632   **JAVA LABORATORY**   **L T P C**
                                                                                   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. Develop a simple paint-like program that can draw basic graphical primitives in different dimensions and colors. Use appropriate menu and buttons.
7. Develop a scientific calculator using even-driven programming paradigm of Java.
8. Develop a template for linked-list class along with its methods in Java.
9. Design a thread-safe implementation of Queue class. Write a multi-threaded producer consumer application that uses this Queue class.
10. 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.
11. Develop a multi-threaded GUI application of your choice.

BIT633   **COMPREHENSION**   **L T P C**
                                                              0 3 0 1

OBJECTIVE

- Comprehension is aimed to assess the students understanding in various subjects he / she studied up to VII semester in the B.Tech. course of study.

Guidelines for Comprehension

I. Comprehension will be conducted in the following 15 subjects

1. Data Structures and Algorithms using C
2. Digital Principles and System Design
3. Object Oriented Programming
4. Computer Organization and Architecture
5. Operating Systems
6. Database Management Systems
7. Java Programming
8. Computer Networks
9. Theory of Computation
10. Network Programming and Management
11. Web Technology
12. C# and .NET Technologies
13. Information Theory and Coding
14. Open Source Systems
15. Cryptography and Network Security

II. The 15 Subjects will be divided into three groups having five subjects each.

III. A panel of three examiners including one external will be evaluating the Students.

V. Comprehension is valued for 100 marks (70 External + 30 Internal)

- Three written tests for 30 marks.
- Viva-voce exam for 70 marks by the panel.

VI . Each written test will have 50 multiple choice questions from five subjects. (Two Questions from each unit of each subject)

VII. Only one student is evaluated at a time for a minimum of 10 minutes.

VIII. Same team evaluates all the students.

BIT001   INFORMATION STORAGE AND MANAGEMENT   L T P C
3 0 0 3

OBJECTIVES
- To study about the storage technologies and its architecture
- To study the network storage and availability of information
- To enhance the security with storage
- To know about the virtualization technologies

UNIT I   STORAGE SYSTEM   9
Introduction to information storage, virtualization and cloud computing - Key data center elements - Compute, application, and storage virtualization -Disk drive & flash drive components and performance – RAID - Intelligent storage system and storage provisioning (including virtual provisioning)

UNIT II   STORAGE NETWORKING TECHNOLOGIES AND VIRTUALIZATION   9
Fibre Channel SAN components, FC protocol and operations - Block level storage virtualization - iSCSI and FCIP as an IP-SAN solutions - Converged networking option – FCoE - Network Attached Storage (NAS) - components, protocol and operations - File level storage virtualization - Object based storage and unified storage platform

UNIT III   BACKUP, ARCHIVE, AND REPLICATION   9
Business continuity terminologies, planning and solutions - Clustering and multi-pathing architecture to avoid single points of failure - Backup and recovery - methods, targets and topologies - Data deduplication and backup in virtualized environment - Fixed content and data archive - Local replication in classic and virtual environments - Remote replication in classic and virtual environments - Three-site remote replication and continuous data protection

UNIT IV   CLOUD COMPUTING CHARACTERISTICS AND BENEFITS   9
Cloud Enabling technologies – Characteristics and benefits of cloud computing - Services and deployment models - Cloud computing infrastructure – Cloud challenges - Cloud migration considerations

UNIT V   SECURING AND MANAGING STORAGE INFRASTRUCTURE   9
Security threats, and counter measures in various domains - Security solutions for FC-SAN, IP-SAN and NAS environments - Security in virtualized and cloud environments - Monitoring and managing various information infrastructure components in classic and virtual environments - Information lifecycle management (ILM) and storage tiering

TOTAL : 45

TEXT BOOK
1. Information Storage and Management: Storing, Managing, and Protecting Digital Information in Classic, Virtualized, and Cloud Environments, 2nd Edition, By: EMC Education Services, John Wiley & Sons, May 2012

REFERENCES
1. Robert spadling, "Storage networks: The complete reference", Tata McGrawhill, Osborne, 2003.
2. Marc Farley, "Building storage networks", Tata McGraw Hill, Osborne, 2001.

BIT002   **DISTRIBUTED SYSTEMS**   **L T P C**
                                                                        3 0 0 3

OBJECTIVES
- To carry out the basic research needed to develop new geographic information technologies that are distributed, ubiquitous, and mobile, allowing geographic information to be accessed, analyzed, and used in decision-making anywhere, at any time
- Students are expected to develop distributed applications using latest technologies

UNIT I   INTRODUCTION   9
Characterization of Distributed Systems - Examples - Resource Sharing and the Web - Challenges - System Models - Architectural and Fundamental Models - Networking and Internetworking - Types of Networks - Network Principles - Internet Protocols - Case Studies.

UNIT II   PROCESSES AND DISTRIBUTED OBJECTS   9
Interprocess Communication - The API for the Internet Protocols - External Data Representation and Marshalling - Client-Server Communication - Remote Procedure Call - Events and Notifications - Java RMI - Case Study, Group Communication - Distributed Objects and Remote Invocation - Communication between Distributed Objects - Case Study

UNIT III   OPERATING SYSTEM ISSUES – I   9
The OS Layer - Protection - Processes and Threads - Communication and Invocation – OS Architecture - Security - Overview - Cryptographic Algorithms - Digital Signatures - Cryptography Pragmatics - Case Studies - Distributed File Systems - File Service Architecture - Sun Network File System - The Andrew File System

UNIT IV   SYNCHRONIZATION   9
Synchronization in distributed systems – Clock synchronization – Mutual exclusion – Electron Algorithms – Atomic transactions –Dead Locks in distributed systems – Threads –Thread usage and Implementation of thread packages – Processor allocation.

UNIT V   DISTRIBUTED TRANSACTION PROCESSING   9
Transactions - Nested Transactions - Locks - Optimistic Concurrency Control - Timestamp Ordering - Comparison - Flat and Nested Distributed Transactions - Atomic Commit Protocols - Concurrency Control in Distributed Transactions - Distributed Deadlocks - Transaction Recovery - Overview of Replication And Distributed Multimedia Systems.

TOTAL : 45

TEXT BOOKS:
1. George Coulouris, Jean Dollimore and Tim Kindberg, Distributed Systems Concepts   and Design, Pearson Education, 5th Edition, 2006.
2. Mukesh Singal and Shivaratri N.G., "Advanced Concepts in Operating System ", McGraw Hill., New York, 1994.

REFERENCES:
1. Sape Mullender, Distributed Systems, Addison Wesley, 2nd Edition, 1993.
2. Albert Fleishman, Distributes Systems - Software Design and Implementation, Springer-Verlag, December 16, 2011
3. M.L.Liu, Distributed Computing Principles and Applications, Pearson Education, 2004.
4. Andrew S Tanenbaum, Maartenvan Steen, Distributed Systems – Principles and Pardigms, Pearson Education, 2007.

BIT003   **MOBILITY ENGINEERING**   **L T P C**
                                                                3 0 0 3

OBJECTIVES
- The proposed course would help the students to acquire knowledge on various mobile technologies available and their future trends, learn how the existing technology can transform to mobile technology, learn about the devices, platform, various layers involved and how the data flows end-to-end.
- The course also will help the students to understand mobile testing and applications of mobile technology in various industries like Healthcare, Banking and Finance etc.

UNIT I   INTRODUCTION TO MOBILITY   2
Evolution of Mobility – Classification of Mobile technologies-Portable, Personal, Static and Shared-Current trends in mobility- Genres of mobility- Future of Mobility.

UNITII   NEED FOR MOBILITY   16
Transformation to Mobility - Why this transformation - ASIS information - Business decisions on the fly - Work force management - Remote Access - Migration Roadmap – Accessibility
Devices - IDPI – Mobile Devices - MDPI– Mobile Devices - HDPI– Mobile Devices and Tablet - XHDPI – Tablets
Platforms - Native– Android, iOS, Symbian, Windows Mobile, Black Berry HTML 5 and Java Script
Data & Storage - Data Source, Data Manipulation, Data mining – Representation - Dashboard, Graphs- Temporary storage of data depends on device
Connectivity - SSL, Digital Certificate, Security tokens, WIFI, Internet, Client Server Configuration
Content - Formats support - File format/Video/Audio/PDF Files.
Mobile App - End to End data flow from UI to / from DB based on remote access using device, platform, Data /Storage/connectivity and content

UNITIII   ENTERPRISE MOBILITY SOLUTION LAYERS AND ARCHITECTURE   10
Enterprise mobility Solution layers – Device layer, Access layer, Adaptation layer, Management Layer and Services Layer and Application layer, Mobile Architecture layer – (UI/ Web services/DAO) – 3tier – Mobile Layer – to co-exist with traditional web pages – Mobile API to interact with backend-web services

**UNITIV   MOBILE APPLICATION DEVELOPMENT ENVIRONMENT AND
               MOBILE TESTING   11**
Foundation to mobile application development - In Android, iOS, Windows Mobile - HTML 5,Java Script - Industry trends, Advantage, challenges, concept of native application development / multi-platform development (MEAP)- Introduction to API - Configuration and setup on the device - Sample programs / problems, Testing Life Cycle- Simulator testing- Real Time Testing – Performance, Stability and Usability testing on Mobile Application Deployment of Enterprise App for Consumers-Server Deployment

UNITV   APPLICATIONS OF MOBILITY   6

Mobility in Healthcare - Mobility in Education - Mobility in Banking & Finance – M-Commerce - Mobile Social Networking - Location Based Services - Bring your own device (BYOD)

TOTAL : 45

TEXT BOOK:
1. Jithesh Sathyan , Anoop N., Navin Narayan, Shibu Kizhakke Vallathai, "A Comprehensive Guide to Enterprise Mobility", CRC Press, 2013

REFERENCES:
1. Carsten Srensen, "Enterprise Mobility: Tiny Technology with Global Impact on Work (Technology, Work and Globalization)" Publisher Palgrave Macmillan, 2011
2. Greg Shackles ,"Mobile Development with C#: Building Native IOS, Android, and Windows Phone Applications (Paperback)", O'Reilly Media Publishers, 2012
3. Sumi Helal, Raja Bose, Wengdong Li, "Mobile Platforms and Development Environments (Paperback)", Morgan & Claypool Publishers, 2012
4. Developing Modern Mobile Web Apps patterns & practices – Microsoft

National Engineering College (An Autonomous Institution, Affiliated to Anna University, Chennai), K.R.Nagar, Kovilpatti

Curriculum & Syllabus for B.Tech. (IT)   **Regulations-2011**

BCS003	UNIX INTERNALS	L	T	P	C
	(Common to CSE & IT)	3	0	0	3

OBJECTIVES

- To explore the design concepts of UNIX OS
- To understand the functional components of UNIX

UNIT I   OVERVIEW OF UNIX OS   7

General Review of the System - History - System structure - User Perspective – Operating System Services - Assumptions About Hardware, Introduction to the Kernel – Architecture - System Concepts - Data Structures - System Administration.

UNIT II   KERNEL DATA STRCUTURES   9

The Buffer Cache - Headers - Buffer Pool - Buffer Retrieval - Reading and Writing Disk Blocks - Advantages and Disadvantages, Internal Representation of Files - Inodes - Structure - Directories - Path Name to Inode - Super Block - Inode Assignment - Allocation of Disk Blocks - Other File Types.

UNIT III   FILE SYSTEM   10

System Calls for the File System - Open - Read - Write - Lseek - Close - Create - Special file Creation - Change Directory and Change Root - Change Owner and Change Mode - Stat - Fstat - Pipes - Dup - Mount - Unmount - Link - Unlink - File System Abstraction - Maintenance.

UNIT IV   PROCESS MANAGEMENT AND CONTROL   10

The System Representation of Processes - States - Transitions - System Memory – Context of a Process - Saving the Context - Manipulation of a Process Address Space – Sleep - Process Control - signals - Process Termination – Awaiting process - Invoking other Programs – The Shell - System Boot and the INIT Process - Process scheduling.

UNIT V   MEMORY AND I/O SUBSYSTEM   9

Memory Management Policies - Swapping - Demand Paging - a Hybrid System - I/O Subsystem - Driver Interfaces - Disk Drivers - Terminal Drivers.

TOTAL: 45

TEXT BOOK

1. Maurice J. Bach, "The Design of the Unix Operating System", Pearson Education, 2008.

REFERENCES

1. Marshall Kirk McKusick, George V. Neville-Neil, "The Design and Implementation of the FreeBSD Operating System", Addison-Wesley, 2007.
2. Richard Stevens, "UNIX Network Programming"- Volume I- Pearson Education, New Delhi, 2006.
3. Uresh Vahalia, "UNIX Internals: The New Frontiers", Prentice Hall, 2000.
4. Daniel P. Bovet, Marco Cesati, "Understanding the Linux Kernel", O'Reilly Press, 2000.

BCS007	DATA WAREHOUSING AND DATA MINING	L	T	P	C
	(Common to CSE & IT)	3	0	0	3

OBJECTIVES

- To identify data warehouse architecture and necessity for data mining.
- To learn the importance and methods of data preprocessing.
- To understand the concepts of data warehousing and OLAP.
- To understand the data mining techniques and their applications.
- To provide insight on Big data issues.

UNIT I   DATA WAREHOUSE AND OLAP TECHNOLOGY   9

Introduction to Data Warehousing - 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 – Business analysis reporting, Query tools and Applications - Online Analytical Processing (OLAP) - OLAP and Multidimensional Data model.

UNIT II   DATA PREPROCESSING   9

Data Mining - Data Mining Functionalities - Data Preprocessing - Data Cleaning - Data Integration and Transformation - Data Reduction - Data Discretization and Concept Hierarchy Generation.

UNIT III   ASSOCIATION RULES   9

Association Rule Mining: Market Basket Analysis - Frequent pattern mining - Apriori algorithm - Generating Association rules from frequent items - Improving the efficiency of Apriori – mining - Multilevel association rules - Multidimensional association rules - Constraint based association Mining.

UNIT IV   CLASSIFICATION AND CLUSTERING   9

Classification and Prediction, Issues - Decision Tree Induction - Bayesian Classification - Rule based classification - Other Classification Methods - Prediction - Accuracy and Error Measures - Cluster Analysis - Types of data - Categorization of Clustering methods - Partitioning methods - Hierarchical Methods - Outlier Analysis.

UNIT V   MINING MULTIMODAL DATA   9

Multidimensional Analysis and Descriptive Mining of Complex Data Objects - Spatial Data mining - Multimedia Data mining - Text Mining – Mining the WWW - Applications and Trends in Data Mining, Big Data: Introduction – Hadoop – Implications – Risks.

TOTAL: 45

TEXT BOOKS

1. Jiahei Han, Micheline Kamber, "Data Mining: Concepts and Techniques", Morgan Kaufmann, 2nd Edition, 2011.
2. Alex Berson, Stephen J.Smith, "Data Warehousing, Data Mining, & OLAP", Tata McGraw-Hill Edition, 2004.

REFERENCES

1. Margaret H.Dunham, "Data Mining: Introductory and Advanced Topics", Pearson Education, 2004.
2. Sam Anahory, Dennis Murry, "Data Warehousing in the real world", Pearson Education, 2003.
3. David Hand, Heikki Manila and Padhraic Symth, "Principles of Data Mining", Prentice Hall of India, 2004.
4. W.H.Inmon, "Building the Data Warehouse", 3rd Edition, Wiley, 2003.
5. Paulraj Ponniah, "Data Warehousing Fundamentals", Wiley-Interscience Pub., 2003.
6. Big Data: A Revolution That Will Transform How We Live, Work and Think", Viktor Mayer-Schonberger, Kenneth Cukier, Houghton Mifflin Harcourt Publication, 2013.

BIT701	**INFORMATION THEORY AND CODING**	**L**	**T**	**P**	**C**
		3	**1**	**0**	**4**

OBJECTIVES

- Expose students to the principles and practice of information theory, covering both theoretical and applied issues.
- It comprises the source coding methods as text, audio, speech, image & video methods and error control coding methods as block codes & convolutional codes.
- It covers the basic principles of information theory, including the basic theory and algorithms behind source and channel coding for single-user and multi-user systems.

UNIT I   INFORMATION THEORY   12

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

UNIT II   SOURCE CODING: TEXT, AUDIO AND SPEECH   12

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   12

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   12

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   12

Convolutional codes – code tree, trellis, state diagram - Encoding – Decoding: Sequential search and Viterbi algorithm – Principle of Turbo coding.

L:45 T:15 TOTAL: 60 PERIODS

TEXT BOOKS
1. R Bose, "Information Theory, Coding and Cryptography", Second Edition, Tata Mc-Graw Hill Education Private Limited, 2008
2. Fred Halsall, "Multimedia Communications: Applications, Networks, Protocols and Standards", Pearson Education Asia, 2009
3. Simon Haykin, "Communication Systems", Third Edition, Wiley India, 2008

REFERENCES
1. K Sayood, "Introduction to Data Compression" Third Edition, Elsevier, 2006
2. S Gravano, "Introduction to Error Control Codes", Oxford University Press, 2007
3. Amitabha Bhattacharya, "Digital Communication", Tata Mc- Graw Hill Education Private Limited, 2006.

BIT702	**COMPUTER GRAPHICS AND MULTIMEDIA**	**L**	**T**	**P**	**C**
		3	**1**	**0**	**4**

OBJECTIVES
- To learn the basics of computer graphics concepts which include both 2D and 3D and about graphics programming.
- To have a detailed knowledge of shaping the objects and shadows
- To introduce the concepts of fractals and Boolean operations in shaping the objects.

UNIT I   2D PRIMITIVES   12

Overview of Graphics Systems – Output Primitives - Line, Circle and Ellipse drawing algorithms – Attributes of output primitives - Two dimensional Geometric transformation - Pivot Point Rotation –Homogenous Coordinates – Affine Transformations - Two dimensional viewing – Clipping and Windowing-Line clipping algorithms (Cohen- Sutherland, Liang-Barsky, Nicholl–Lee – Nicoll)–Polygon Clipping (Sutherland-Hodgeman) – Text Clipping.

UNIT II   3D CONCEPTS   12

Parallel and Perspective projections - Three dimensional object representation – Polygons, Curved lines, Splines, Quadric Surfaces,- Visualization of data sets - Three-Dimensional Geometric and Modeling Transformations – Three-Dimensional Viewing -Visible surface identification- Depth Buffer Method – Wire frame Method - Three dimensional Clipping – Hidden surface and line elimination - Shading and coloring methods - Basic modeling concepts and Modeling methods.

UNIT III   GRAPHICS PROGRAMMING   12

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 - 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 IV   OVERVIEW OF MULTIMEDIA   12

Multimedia Hardware & Software – Components of multimedia – Text, Image –   Graphics – Audio – Video – Animation – Authoring – Multimedia Project development.

UNIT V   MULTIMEDIA SYSTEMS AND APPLICATIONS   12

Multimedia Communication Systems – Database Systems – Synchronization issues –   Presentation requirements – Applications – Video conferencing – Virtual reality – Interactive Video – Media on Demand.

L:45 T:15 TOTAL: 60 PERIODS

TEXT BOOKS
1. Donald Hearn, M.Pauline Baker, "Computer Graphics – C Version", Second Edition, Pearson Education, 2004
2. Edward Angel , Dave Shreiner ,"Interactive Computer Graphics: A Top-Down Approach with Shader-Based OpenGL", Addison-Wesley; Sixth Edition, 2011.
3. F.S. Hill Jr, Stephen Kelley, "Computer Graphics using OPENGL", Third Edition, Prentice Hall Education, 2006.
4. Ralf Steinmetz, Klara Steinmetz, "Multimedia Computing, Communications &   Applications" Pearson education, 2004.

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.
2. Tay Vaughan, "Multimedia Making It Work", Seventh Edition, McGraw Hill, 2008.
3. J. D. Foley, A. VanDam, S. K. Feiner, J. F. Hughes, "Computer Graphics Principles and Practice", Addison and Wesley Publications, 2002.
4. Jonas Gomes, Luiz Velho, Mario Costa Sousa "Computer Graphics: Theory and Practice", CRC Press, 2012.

BIT703   **WEB TECHNOLOGY**   **L   T   P   C**
                                                                                        3   1   0   4

OBJECTIVE
- The subject provides knowledge to learn and implement the various web programming technologies of current trend today.

UNIT I   INTRODUCTION TO INTERNET WEB PROGRAMMING   12
Web Essentials: Clients, Servers, and Communication. An Introduction to HTML History- Some Fundamental HTML Elements - HTML tags – Relative URLs- Lists-tables- Frames- Forms- new tags in HTML 5.

UNIT II   CLIENT SIDE PROGRAMMING   12
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. Client-Side Programming: The JavaScript Language- Introduction JavaScript in Perspective-Syntax - Variables and Data Types-Statements-Operators- Literals-Functions-Objects-Arrays-Built-in Objects.

UNIT III   SERVER-SIDE PROGRAMMING   12
Server-Side Programming: Java Servlets- Architecture -Overview- A Servelet- Generating Dynamic Content-Life Cycle - Parameter Data – Sessions - Cookies - URL Rewriting - Data Storage Servelets and Concurrency - Case Study-Related Technologies. Separating Programming and Presentation: JSP Technology - Introduction-JSP - Running JSP Applications Basic JSP - JavaBeans Classes and JSP-Tag Libraries – Ajax.

UNIT IV   ADVANCED WEB SERVER SIDE PROGRAMMING   12
EJB – Fundamentals -Writing Session beans – Entity bean – Web application frameworks-MVC (model view controller) frame work- struts- JSF.

UNIT V   WEB SERVICE   12
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.

L:45 T:15 TOTAL: 60 PERIODS

TEXT BOOK
1. Jeffrey C.Jackson, "Web Technologies--A Computer Science Perspective", Pearson Education, 2011.

REFERENCES
1. Ed Roman, "Mastering Enterprise JavaBeans", Third Edition, Wiley, 2007   .
2. Robert. W. Sebesta, "Programming the World Wide Web", Seventh Edition, Pearson Education, 2013.
3. Paul J. Deitel, Harvey Deitel, Abbey Deitel, "Internet and World Wide Web How to Program", Fifth Edition, 2011, ISBN0132151006, 9780132151009.
4. Ralph Moseley, "Developing Web Applications", Wiley, 2011.
5. Chris Bates, "Web Programming – Building Intranet applications", Third Edition, Wiley Publications, 2009
6. Kogent Solutions Inc, "Java server programming java JavaEE5 Black Book", Dreamtech Press, ISBN-13: 978-81-7722-835-9

| **BCS006** | **CRYPTOGRAPHY AND NETWORK SECURITY** | **L** | **T** | **P** | **C** |
| | **(Common to CSE & IT)** | **3** | **0** | **0** | **3** |

OBJECTIVES
- To analyze the various methods of conventional encryption.
- To understand the concepts of public key encryption and number theory.
- To understand Authentication and Hash functions.
- To learn the network security tools and applications.

UNIT I   INTRODUCTION   9
Overview - Classical Encryption techniques - Block Ciphers - Data Encryption Standard - Block Cipher Design Principles and Modes of Operation - Evaluation criteria for AES - AES Cipher – Triple DES.

UNIT II   PUBLIC KEY CRYPTOGRAPHY   9
Introduction to Number Theory: Modular Arithmetic, Euclid's Algorithm, Fermat's and Euler's Theorems, The Chinese Remainder Theorem and Discrete Logarithms. - Confidentiality using Symmetric Encryption - Public Key Cryptography and RSA - Key Management – Diffie - Hellman key Exchange - Elliptic Curve Architecture and Cryptography.

UNIT III   AUTHENTICATION AND HASH FUNCTION   9
Message Authentication requirements - Authentication functions - Message Authentication Codes (MAC) – Hash Functions - Security of Hash Functions and MACs. Hash Algorithms: MD5 message Digest Algorithm - Secure Hash Algorithm – RIPEMD-160 – HMAC. Digital Signatures - Digital Signature Standard - User Authentication Protocols.

UNIT IV   NETWORK SECURITY   9
Kerberos - Web Security: Web Security issues, Secure Sockets Layer (SSL), Transport Layer Security (TLS), and Secure Electronic Transaction (SET). Electronic Mail Security: PGP - S/MIME. IP Security.

UNIT V   SYSTEM LEVEL SECURITY   9
Intrusion detection - password management - Viruses and related Threats - Virus Counter measures - Firewall Design Principles - Trusted Systems.

TOTAL: 45 PERIODS

TEXT BOOKS
1. William Stallings, "Cryptography and Network Security - Principles and Practices", Pearson Education, 4th Edition, 2006.
2. Behrouz A. Foruzan and Debdeep Mukhopadhyay, "Cryptography and Network Security", Tata McGraw-Hill, 2nd Edition, 2010.

REFERENCES
1. Bruice Schneier, "Applied Cryptography: Protocols, Algorithms and Source Code in C", Wiley India Private Limited., 2nd Edition, 2008.
2. Charles P. Pfleeger and Shari Lawrence Pfleeger, "Security in Computing", 4th Edition, Pearson Education, 2011.
3. Wade Trappe, Lawrence C. Washington, "Introduction to Cryptography with Coding Theory", 2nd Edition, Pearson Education, 2007.
4. Wenbo Mao, "Modern Cryptography: Theory and Practice", Pearson Education, 2007.
5. Thomas Calabrese, "Information Security Intelligence: Cryptographic Principles and Applications", Thomson Delmar Learning, 2004.

BIT731	**COMPUTER GRAPHICS AND MULTIMEDIA LABORATORY**	**L**	**T**	**P**	**C**
		0	**0**	**3**	**2**

LIST OF EXPERIMENTS

1. To implement Bresenham's algorithms for line, circle and ellipse drawing algorithms.
2. To perform 2D Transformations such as translation, rotation, scaling, reflection and shearing of objects.
3. To implement Cohen-Sutherland 2D clipping and window view port mapping
4. To perform 3D Transformations such as translation, rotation and scaling.
5. To Implement Composite 3D transformations.
6. To Draw 3D objects and scenes using OPENGL.
7. To convert between color models (RGB, YIQ, CMY & HSV)
8. Implementation of text compression algorithm using RLE and Static Huffman.
9. To implement image compression algorithm using Huffman.
10. To perform animation using any Animation software (Macromedia Flash, Swish..etc)
11. To perform basic operations on image using Photoshop /GIMP /any equivalent
    Image manipulation software

TOTAL : 45 PERIODS

BIT732   **WEB TECHNOLOGY LABORATORY**   **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 using Servlets:
   - To invoke servlets from HTML forms
   - Session
   - Cookie
5. 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.
6. Programs using AJAX
7. Program using EJB
   ❖ Stateless session bean
   ❖ Stateful session bean
8. Creation of web service in J2EE and Invoke it in DOTNET.
9. Develop any web application using web technologies.

                                                                        TOTAL : 45 PERIODS

National Engineering College (An Autonomous Institution, Affiliated to Anna University, Chennai), K.R.Nagar, Kovilpatti

Curriculum & Syllabus for B.Tech. (IT)   Regulations-2011

BIT733	MOBILITY WITH ANDROID	L	T	P	C
		0	0	3	2

OBJECTIVES

- The proposed integrated course would help the students to learn the concepts of developing a mobility application over the popular Android platform of Google. The course is designed to have some theoretical orientation of mobility and Android through class room teaching along with the hands-on understanding and would culminate in development of an individual Android application by each of the student.

UNIT I   MOBILITY AND ANDROID OVERVIEW   9

Evolution of Mobility - Classification of Mobile technologies - Portable, Personal, Static and Shared - Current trends in mobility - Future of Mobility - Foundation to mobile application development in Android - Mobile Ecosystems - Mobile Architecture layer - (UI / Web services/DAO) - 3 tier - (Mobile Layer – to co-exist with traditional Web pages - Mobile API to interact with backend- Web Services - Introduction to XML, JSON formats. Overview - What is Android?-History of Android - Application development - App marketing place - Advantages of android over other OS - Anatomy of an Android Application

UNIT II   ANDROID APP BASICS AND USER INTERFACE LAYOUT   9

Basic Tools like ADB, DDMS – Emulator - Debugging and Running the App - Activities and Intents - Intent receivers - Content providers - Cursor and queries - Broadcast receiver and Permission Linear Layout - Absolute Layout - Table Layout - Relative Layout - Frame Layout - Scroll View Views: Gallery and Image View - Image Switcher View – Photo View – Profile View - Grid View - Web View - Analog clock View and Digital clock view.

UNIT III   UI EVENT MANAGEMENT   9

UI Controls   Widgets - Date, Time, Calendar - Custom Widgets – Label – Buttons – Checkbox – Radio Button - Seek bar - Containers – Filling – Padding - Action bar - Raising Toasts – Alerts - Creating a Menu - Menu Items - Menu Types - Expanded Menus - Icon Menus – Submenus Notification and Alerts - Status Bar - Dialog Notification - Creating a Progress Dialog– Creating a custom Dialog - Installing and using external Fonts in the application.

UNIT IV   DATA STORAGE MANAGEMENT   9

Preference Files Management- Create PDF, CSV - Using SQLite Databases - Connecting to External Database – HTTP Client - Request from Client - Parsing responses.

UNIT V   NETWORKING AND LOCATION BASED SERVICES   9

Telephony Manager, SMS, Phone Contacts - Sending mail - Playing Audio - Playing video Streaming - Image Zoom-in - Zoom-out – Cropping – Scribbling - File Upload - File Download Interface to Social Networking like Face book, Android Services, Progress bar - Displaying map in the application.

TOTAL: 45 PERIODS

TEXT BOOK
1. Wei-Meng Lee, "Beginning Android Application Development", Publisher Wiley, 2011.

REFERENCES
1. James Steele, Nelson, "The Android Developer's Cookbook: Building Applications with the Android SDK: Building Applications with the Android SDK (Developer's Library) [Paperback]", Publisher Addison Wiley.
2. Paul J.Deitel, Harvey M. Deitel, "Android for Programmers: An App-Driven Approach (Deitel Developer Series)", Publisher Pearson, 2012.

BIT801	**MOBILE COMMUNICATION**	**L**	**T**	**P**	**C**
	(Common to IT & EEE)	**3**	**0**	**0**	**3**

OBJECTIVES
- To learn the basics of Wireless voice and data communications technologies.
- To study the working principles of wireless LAN and its standards.
- To build working knowledge on various telephone and satellite networks.
- To build knowledge on various Mobile Computing algorithms.
- To build skills in working with Wireless application Protocols to develop mobile content applications.

UNIT I   WIRELESS COMMUNICATION FUNDAMENTALS   9
Introduction – Wireless transmission – Frequencies for radio transmission – Signals – Antennas – Signal Propagation – Multiplexing – Modulations – Spread spectrum – MAC – SDMA – FDMA – TDMA – CDMA – Cellular Wireless Networks

UNIT II   TELECOMMUNICATION SYSTEMS   9
GSM – GPRS – DECT – TETRA- UMTS – IMT-2000
Satellite Networks Basics – Parameters and Configurations – Capacity Allocation – FAMA and DAMA – Broadcast Systems – DAB - DVB.

UNIT III   WIRELESS LAN   9
IEEE 802.11 - Architecture – services – MAC – Physical layer – IEEE 802.11a - 802.11b standards – Infrared vs Radio Transmission, Infrastructure and Ad hoc networks-HIPERLAN   – Blue Tooth.

UNIT IV   NETWORK AND TRANSPORT LAYER   9
Mobile Network Layer: Mobile IP, Dynamic Host Configuration Protocol, ad hoc networks
Mobile Transport Layer: Tradition TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/ Fast recovery Transmission / timeout freezing, selective retransmission, Transaction oriented TCP.

UNIT V   WIRELESS ATM   9
Motivation for ATM, wireless ATM, Working group, WATM services, reference model, functions, radio access layer, handover, location management, Addressing, mobile quality of service, access point control protocol.
Support for Mobility: File systems, World Wide Web, Wireless Application Protocol

TOTAL: 45 PERIODS

TEXT BOOKS
1. Jochen.H.Schiller "Mobile Communications" Pearson Education Limited , Second Edition, 2007.
2. Raj Kamal, "Mobile Computing", Oxford University Press, New Delhi, 2007.

REFERENCES
1. S.Rappapart, "Wireless Communication", Prentice Hall, NJ, 2002
2. Richards ,"Mobile Satellite Communication Engineering", Second Edition, Addision- Wesley, 2002.
3. Andrea Goldsmith, "Wireless Communications", Cambridge University Press, 2007.
4. Jon W. Mark, Weihua Zhuang, "Wireless Communications and Networking", Prentice Hall, New Delhi, 2007.

BMG601	PRINCIPLES OF MANAGEMENT	L T P C
		3 0 0 3

OBJECTIVES:
- To get the skills needed to successfully manage an organization.
- To understand concepts of strategic and tactical organizational planning.
- Implement employee motivational approaches and conflict management skills.
- To describe common performance appraisal processes.
- To understand group and team management, management development, and employee training.
- Describe concepts of controlling and control systems.

UNIT I   FOUNDATIONS   9
Historical developments –approaches to management– Management and Administration – Development of Management Thought – Contribution of Taylor and Fayol – Functions of Management – Types of Business Organization ,Meaning ,features merits and demerits.

UNIT II   MANAGERS AND ENVIRONMENT   9
Social responsibility–Planning – Objectives – Setting Objectives – Process of Managing through Objectives – Strategies- Policies and Planning Premises- Forecasting – Decision-making.

UNIT III   FUNCTIONAL AREA OF ORGANISATION   9
Formal and informal organization – Organization Chart – Structure and Process – Departmentation by different strategies – Line and Staff authority – Benefits and Limitations – De-Centralization and Delegation of Authority – Staffing – Selection Process - Techniques – HRD – Managerial Effectiveness.

UNIT IV   MOTIVATION AND DIRECTIONS   9
Objectives– Human Factors – Creativity and Innovation – Harmonizing Objectives – Leadership – Types of Leadership Motivation – Hierarchy of needs – Motivation theories – Motivational Techniques – Job Enrichment – Communication.

UNIT V   CONTROLLING STRATEGIES   9
System and process of Controlling – Requirements for effective control – The Budget as Control Technique – Information Technology– Computers in handling the information – Productivity – Problems and Management – Control of Overall Performance – Direct and Preventive Control – Reporting – The Global Environment – Globalization and Liberalization – International Management and Global theory of Management.

TOTAL: 45 PERIODS

TEXT BOOKS
1. Hellriegel, Slocum & Jackson, "Management – A Competency Based Approach", Thomson South Western, 10th Edition, 2007.
2. Harold Koontz, Heinz Weihrich and mark V Cannice, "Management – A global & Entrepreneurial Perspective", Tata Mcgraw Hill, 12th Edition, 2007.
3. Andrew J. Dubrin, "Essentials of Management", Thomson Southwestern, 7th Edition, 2007.

REFERENCES
1. Stephen P. Robbins and Mary Coulter, "Management", Prentice Hall of India, 8th Edition, 2012.
1. Charles W.L Hill, Steven L McShane, "Principles of Management", Mcgraw Hill Education, Special Indian Edition, 2007.
2. Vijayaraghavan G.K & Sivakumar M. "Principles of Management", Lakshmi Publications, 1st Edition, 2011.
3. Ramachandran. S. "Principles of Management", Air Walk Publications, 1st Edition, 2007.

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Curriculum & Syllabus for B.Tech. (IT)   Regulations-2011

BIT007 **SOFTWARE PROJECT MANAGEMENT** L T P C
3 0 0 3

OBJECTIVES
- To provide basic software project management skills with a strong emphasis on issues and problems associated with delivering successful IT projects.
- The module is designed to provide an understanding of the particular issues encountered in handling IT projects.
- To provide knowledge on management activities as Evaluation, Planning, Monitoring & Control and Managing Teams.
- To undertake and be aware of aspects of planning management.

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 – Prioritizing Monitoring – Getting Project Back To Target – Change Control – Managing Contracts – Introduction – Types Of Contract – Stages In Contract Placement – Typical Terms Of A Contract – Contract Management – Acceptance.

UNIT V **MANAGING PEOPLE AND ORGANIZING TEAMS** **9**
Introduction – Understanding Behavior – Organizational Behavior: A Background – Selecting The Right Person For The Job – Instruction In The Best Methods – Motivation – The Oldman – Hackman Job Characteristics Model – Working In Groups – Becoming A Team –Decision Making – Leadership – Organizational Structures – Stress –Health and Safety – Case Studies.

TOTAL: 45 PERIODS

TEXT BOOK
1. Bob Hughes, Mike Cotterell, "Software Project Management", Fifth Edition, Tata McGraw Hill Edition, 2010.

REFERENCES
1. Ramesh, Gopalaswamy, "Managing Global Projects", Tata McGraw Hill, 2006.
2. Walker Royce, "Software Project Management", Pearson Education, 1999.
3. Pankaj Jalote, "Software Project Management in Practice", Pearson Education, 2009.

BIT008 **WIRELESS SENSOR NETWORKS** **L   T   P   C**
(Common to IT & ECE) **3   0   0   3**

OBJECTIVES
- To understand the basics of Sensor Networks.
- To learn various fundamental and emerging protocols of all layers.
- To study about the issues pertaining to major obstacles in establishment and   efficient management of sensor networks.
- To demonstrate the nature and applications sensor networks.

UNIT I   INTRODUCTION   9
Challenges for wireless sensor networks, Comparison of sensor network with ad hoc network, Single node architecture – Hardware components, energy consumption of sensor nodes, Network architecture – Sensor network scenarios, types of sources and sinks, single hop versus multi-hop networks, multiple sinks and sources, design principles, Development of wireless sensor networks.

UNIT II   PHYSICAL LAYER   9
Introduction, wireless channel and communication fundamentals – frequency allocation, modulation and demodulation, wave propagation effects and noise, channels models, spread spectrum communication, packet transmission and synchronization, quality of wireless channels and measures for improvement, physical layer and transceiver design consideration in wireless sensor networks, Energy usage profile, choice of modulation, Power Management.

UNIT III   DATALINK LAYER   9
MAC protocols – fundamentals of wireless MAC protocols, low duty cycle protocols and wakeup concepts, contention-based protocols, Schedule-based protocols - SMAC, BMAC, Traffic-adaptive medium access protocol (TRAMA), Link Layer protocols – fundamentals task and requirements, errorcontrol,framing, link management.

UNIT IV   NETWORK LAYER   9
Gossiping and agent-based uni-cast forwarding, Energy-efficient unicast, Broadcast and multicast, geographic routing, mobile nodes, Data-centric routing – SPIN, Directed Diffusion, Energy aware routing, Gradient-based routing – COUGAR, ACQUIRE, Hierarchical Routing – LEACH, PEGASIS, Location Based Routing – GAF, GEAR, Data aggregation – Various aggregation techniques.

UNIT V   CASE STUDY   9
Target detection tracking, Habitat monitoring, Environmental disaster monitoring, Practical implementation issues, IEEE 802.15.4 low rate WPAN, Operating System Design Issues, Introduction to TinyOS – NesC, Interfaces, modules, configuration, Programming in TinyOS using NesC, Emulator TOSSIM.

TOTAL: 45 PERIODS

TEXT BOOKS
1. Holger Karl , Andreas willig, "Protocol and Architecture for Wireless Sensor Networks", John Wiley Publication, Jan 2006.
2. K.Akkaya and M.Younis, "A Survey of routing protocols in wireless sensor networks", Elsevier Adhoc Network Journal, Vol.3, no.3, pp. 325-349, 2005.

REFERENCES

1. Kazem Sohraby, Daniel Minoli and Taieb Znati, "Wireless Sensor Networks Technology-Protocols and Applications", John Wiley & Sons, 2007.
2. Feng Zhao, Leonidas Guibas, "Wireless Sensor Networks: an information processing approach", Elsevier Publication, 2004.
3. C.S.Raghavendra Krishna, M.Sivalingam and Tarib znati, "Wireless Sensor Networks", Springer Publication, 2004.
4. C. Siva Ram Murthy and B. S. Manoj, "Ad Hoc Wireless Networks Architectures and Protocols", Prentice Hall, PTR, 2004
5. Philip Levis, "Tiny OS Programming", 2006 – www.tinyos.net.
6. Jamal N. Al-karaki, Ahmed E. Kamal, "Routing Techniques in Wireless sensor networks: A survey", IEEE wireless communication, December 2004, 6 – 28.

BIT009	**USER INTERFACE DESIGN**	**L T P C**
		3 0 0 3

OBJECTIVES

- To study the concept of menus, windows, interfaces.
- To study about the human machine interaction.
- To study the characteristics and components of windows.
- To study about various problems in windows design.
- To study the various testing methods

UNIT I   INTRODUCTION   9
Introduction-Importance-Human-Computer interface-characteristics of graphics interface-Direct manipulation graphical system - web user interface-popularity-characteristic & principles.

UNIT II   HUMAN INTERACTION STYLE   9
Direct manipulation and virtual environment – Menu Selection – Form Fill in and dialog boxes – Command and Natural Language – Interaction devices – Collaboration and social media participation.

UNIT III   WINDOWS   9
Windows: 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
Windows layout-test: prototypes - kinds of tests - retest - Information search - visualization - Hypermedia - www - Software tools.

TOTAL: 45 PERIODS

TEXT BOOKS
1. Ben Sheiderman, Catherine plaisant, Maxine Cohen, Steven M Jacobs, "Design the User Interface", Fifth Edition, Pearson Education, 2012.
2. Wilbent. O. Galitz, "The Essential Guide to User Interface Design", Third Edition, John Wiley& Sons, 2007.

REFERENCE
1. Alan Cooper, "The Essential of User Interface Design", Wiley - Dream Tech Limited, 2010.

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BCS010   **ADVANCED JAVA PROGRAMMING**   **L   T   P   C**
                                    (Common to CSE & IT)   **3   0   0   3**

OBJECTIVES
- To learn advanced Java programming concepts like reflection, native code interface, threads, etc.
- To develop network programs in Java.
- To understand concepts needed for distributed and multi-tier applications.
- To understand issues in enterprise applications development.

UNIT I   JAVA BASICS REVIEW   9
Threading Concepts – Components and Events Handling – Filter and Pipe Stream – Byte Code Interpretation – Reflection – Dynamic Reflexive Classes – Java Native Interfaces – Swing.

UNIT II   NETWORK PROGRAMMING IN JAVA   9
Sockets – Secure Sockets – Custom Sockets – UDP Datagram – Multicast Sockets – URL classes – Reading Data from the Server – Writing Data – Configuring the Connection – Reading the Header – Telnet Application - Java Messaging Services.

UNIT III   APPLICATIONS IN DISTRIBUTED ENVIRONMENT   9
Remote Method Invocation - Activation Models - RMI Custom Sockets - Object Serialization – RMI – IIOP Implementation – CORBA – IDL technology – Naming Services – CORBA Programming Models – JAR File Creation.

UNIT IV   MULTI-TIER APPLICATION DEVELOPMENT   9
Server Side Programming – Servlets – Java Server Pages – Applet to Applet Communication – Applet to Servlet Communication – JDBC – Using BLOB and CLOB Objects – Storing Multimedia Data into Databases – Multimedia Streaming Applications – Java Media Framework.

UNIT V   ENTERPRISE APPLICATIONS   9
Server Side Component Architecture – Introduction to J2EE – Session Beans – Entity Beans – Persistent Entity Beans – Transactions.

                                                                        TOTAL: 45 PERIODS

TEXT BOOKS
1.   Cay S.Hortsmann, Gray Cornell, "Core Java: Volume II – Advanced Features", 7th Edition, Pearson Education, 2008.
2.   Elliotte Rusty Harold, "Java Network Programming", 3rd Edition, O'Reilly Media Inc., 2004.
3.   Ed Roman, Rima Patel Sriganesh and Gerold Brose, "Mastering Enterprise Java Beans", 3rd Edition, John Wiley & Sons Inc., 2005.

REFERENCES
1.   Patrick Naughton, "Complete Reference: Java 2", Tata McGraw-Hill, 2003.
2.   Web reference: http://java.sun.com.

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BGE003	INTELLECTUAL PROPERTY RIGHTS (IPR)	L	T	P	C
		3	0	0	3

OBJECTIVES
- To create an awareness on Intellectual Property Rights (IPR)
- To understand patents and copyrights
- To know about application procedures of IPR

UNITI   TYPES OF PROPERTY   9

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   PATENTS AND APPLICATION PROCEDURES   9

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   INTERNATIONAL PARTICES   9

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

UNIT IV   LEGISLATIONS AND POLICY   9

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   CASE STUDIES   9

Case Studies on – Patents (Basumati rice, turmeric, Neem, etc.) – Copyright and relatedrights – 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 Private Limited, 1998.

REFERENCES
1. Eli Whitney, United States Patent Number: 72X, Cotton Gin, March 14, 1974.
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.

BIT010	PARALLEL COMPUTING	L	T	P	C
		3	0	0	3

OBJECTIVES
- To understand the basic concepts of parallel computation and become familiar with state-of-the-art parallel architectures.
- To compare alternative approaches to designing and implementing parallel algorithms and architectures.
- To solve large scale problems and implement system software to support parallel computing on the most common parallel computing platforms.
- To measure and evaluate the performance of parallel applications.

UNIT I   SCALABILITY AND CLUSTERING   9
Evolution of Computer Architecture – Dimensions of Scalability – Parallel Computer Models – Basic Concepts Of Clustering – Scalable Design Principles – Parallel Programming Overview – Processes, Tasks and Threads – Parallelism Issues – Interaction / Communication Issues – Semantic Issues In Parallel Programs.

UNIT II   ENABLING TECHNOLOGIES   9
System Development Trends – Principles of Processor Design – Microprocessor Architecture Families – Hierarchical Memory Technology – Cache Coherence Protocols – Shared Memory Consistency – Distributed Cache Memory Architecture – Latency Tolerance Techniques – Multithreaded Latency Hiding.

UNIT III   SYSTEM INTERCONNECTS   9
Basics of Interconnection Networks – Network Topologies and Properties – Buses, Crossbar and Multistage Switches, Software Multithreading – Synchronization Mechanisms.

UNIT IV   PARALLEL PROGRAMMING   9
Paradigms And Programmability – Parallel Programming Models – Shared Memory Programming.

UNIT V   MESSAGE PASSING PROGRAMMING   9
Message Passing Paradigm – Message Passing Interface – Parallel Virtual Machine.

TOTAL: 45 PERIODS

TEXT BOOKS
1. Kai Hwang and Zhi.Wei Xu, "Scalable Parallel Computing", Tata Mc GrawHill, New Delhi, 2003.
2. Michael J. Quinn, "Parallel Computing Theory and Practice", Second Edition, Tata McGraw-Hill Publishing Company Limited, New Delhi, 2003.

REFERENCES
1. Ananth Grama, Anshul Gupta, George Karypis, Vipin Kumar, "Introduction to Parallel Computing", Pearson, Education, New Delhi, 2009
2. Kai Hwang, "Advanced Computer Architecture", Tata McGraw Hill, New Delhi, 2008
3. David E. Culler & Jaswinder Pal Singh, "Parallel Computing Architecture: A Hardware / Software Approach", Morgan Kaufman Publishers, New Delhi, 1999.

BIT011	CLOUD COMPUTING	L	T	P	C
	(Common to IT & CSE)	3	0	0	3

OBJECTIVES
- To Understand the fundamentals of cloud computing
- To study about the web based applications in cloud
- To know about the use of cloud computing

UNIT I   UNDERSTANDING CLOUD COMPUTING   9
Cloud Computing – History of Cloud Computing – Cloud Architecture – Cloud Storage – Why Cloud Computing Matters – Advantages of Cloud Computing – Disadvantages of Cloud Computing – Companies in the Cloud Today – Cloud Services.

UNIT II   DEVELOPING CLOUD SERVICES   9
Web-Based Application – Pros and Cons of Cloud Service Development – Types of Cloud Service Development – Software as a Service – Platform as a Service – Web Services – On-Demand Computing – Discovering Cloud Services Development Services and Tools – Amazon Ec2 – Google App Engine – IBM Clouds.

UNIT III   CLOUD COMPUTING FOR EVERYONE   9
Centralizing Email Communications – Collaborating on Schedules – Collaborating on To-Do Lists – Collaborating Contact Lists – Cloud Computing for the Community – Collaborating on Group Projects and Events – Cloud Computing for the Corporation.

UNIT IV   USING CLOUD SERVICES   9
Collaborating on Calendars, Schedules and Task Management – Exploring Online Scheduling Applications – Exploring Online Planning and Task Management – Collaborating on Event Management – Collaborating on Contact Management – Collaborating on Project Management – Collaborating on Word Processing - Collaborating on Databases – Storing and Sharing Files.

UNIT V   OTHER WAYS TO COLLABORATE ONLINE   9
Collaborating via Web-Based Communication Tools – Evaluating Web Mail Services – Evaluating Web Conference Tools – Collaborating via Social Networks and Groupware – Collaborating via Blogs and Wikis.

TOTAL: 45 PERIODS

TEXT BOOKS
1. Michael Miller, "Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online", Que Publishing, August 2008.
2. Haley Beard, "Cloud Computing Best Practices for Managing and Measuring   Processes for On-demand Computing, Applications and Data Centers in the Cloud with SLAs", Emereo Pty Limited, July 2008.

BCS025	**GREEN COMPUTING**	**L**	**T**	**P**	**C**
	(Common to CSE & IT)	**3**	**0**	**0**	**3**

OBJECTIVES
- To learn about the importance of the green computing.
- To have a knowledge of the green computing approaches.
- To learn about the architecture of the Green Computing.
- Understanding the applications of green Computing in various domains.

UNIT I   OVERVIEW AND INITIATIVES   9
Overview – Issues: Toxin – Power consumption – Disposals –Power saving – Hardware saving - Current initiatives – Global initiatives – Asia Standards – Consumption issues.

UNIT II   CONSUMPTION ISSUES   9
Minimizing power usage: Power problems – Monitoring power usage – Reducing power usage – Low power computers and components – Cooling costs: Reducing cooling costs – Optimizing airflow – Data center design.

UNIT III   GREEN COMPUTING PLATFORMS   9
Greening process – Datacenter design and redesign – Virtualization.

UNIT IV   GREEN COMPUTING ARCHITECTURE   9
Rethinking of behavior – paperless communication – Recycling.

UNIT V   GREEN COMPUTING MODELS   9
Hardware considerations – Case studies: Energy utilities – Universities – Technological Businesses – Other Organizations.

TOTAL: 45 PERIODS

TEXT BOOKS
1. Toby J.Velte, Anthony T.Velte and Robert Elsenpeter, "Green IT Reduce your Information System's Environmental impact while Adding to the Bottom Line", Tata McGraw-Hill, 2008.
2. John Lamb, "The Greening of IT: How Companies can make a Difference for the Environment", IBM Press, 2009.

REFERENCE
1. Jason Harris, "Green Computing and Green IT Best Practices on Regulations and Industry Initiatives, Virtualization, Power Management, Materials Recycling and Telecommuting", Lulu Publishers, 2008.

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BCS009	HIGH SPEED NETWORKS	L	T	P	C
	(Common to CSE & IT)	3	0	0	3

OBJECTIVES
- To provide an understanding of the networking standards that can be adopted with the current day requirements of complex and voluminous content transfer over heterogeneous platforms.
- To have a primitive level performance analysis for of traffic with different networking standards and to study the standards adopted for handling high traffic.
- To get a feel of designing a High speed network setup with specialized hardware and optimization approaches like parallelism and pipelining.

UNIT I   HIGH SPEED NETWORKS   9

Asynchronous transfer mode – ATM Protocol Architecture, ATM logical Connection – ATM Cell – ATM Service Categories – AAL. High Speed LANs – Fast Ethernet – Gigabit Ethernet – Fibre Channel – Wireless LAN's applications, requirements – Architecture of IEEE 802.11.

UNIT II   CONGESTION AND TRAFFIC MANAGEMENT   9

Single Server Queues – Effects of Congestion – Congestion Control – Traffic Management – Congestion Control in Packet Switching Networks – Frame Relay Congestion Control.

UNIT III   TCP AND ATM CONGESTION CONTROL   9

TCP Flow control – TCP Congestion Control – Retransmission – Timer Management – Exponential RTO backoff – KARN's Algorithm – Window management – Traffic and Congestion control in ATM – Requirements – Attributes – Traffic Management Frame work – Traffic Control – ABR traffic Management – ABR rate control – RM cell formats – ABR Capacity allocations – GFR traffic management.

UNIT IV   INTEGRATED AND DIFFERENTIATED SERVICES   9

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

UNIT V   PROTOCOLS FOR QOS SUPPORT   9

RSVP – Goals and Characteristics, Data Flow, RSVP operations – Protocol Mechanisms – Multiprotocol Label Switching – Operations – Protocol details – RTP – Protocol Architecture – Data Transfer Protocol – RTCP.

TOTAL: 45 PERIODS

TEXT BOOKS
1. William Stallings, "High-speed Networks and Internet", 2nd Edition, Pearson Education, 2002. (UNIT I-V)
2. Jean Warland, Pravin Varaiya, "High-performance Communication Networks", 2nd Edition, Jean Harcourt Asia Private Limited, 2000.

REFERENCES
1. Irvan Pepelnjk, Jim Guichard and Jeff Apcar, "MPLS and VPN architecture", Cisco Press, Volume 1 and 2, 2003.
2. Abhijit S. Pandya, Ercan Sen, "ATM Technology for Broadband Telecommunications Networks", CRC Press, 2004.

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Curriculum & Syllabus for B.Tech. (IT)   Regulations-2011

BCS018	SERVICE ORIENTED ARCHITECTURE	L	T	P	C
	(Common to CSE &IT)	3	0	0	3

OBJECTIVE
- To gain understanding of the basic principles of service orientation.
- To learn service oriented analysis techniques.
- To learn technology underlying the service design.
- To know about various WS-* specification standards.

UNIT I   SOA FUNDAMENTALS   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   SOA AND WEB SERVICES   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   SOA ANALYSIS   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   SOA PLATFORM BASICS   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   WS SPECIFICATION   9
WS-BPEL basics - WS-Coordination overview - WS-addressing - WS-Reliable messaging - WS Policy - WS Security.

TOTAL: 45 PERIODS

TEXT BOOKS
1. Thomas Erl, **"**Service-Oriented Architecture: Concepts, Technology, and Design", Pearson Education, 2005.
2. Douglas K. Barry, "Web Services and Service oriented Architectures -The Savvy Manager's Guide", Morgan Kaufmann Publishers, 2003.

REFERENCES
1. Thomas Erl, "SOA: Principles of Service Design", Prentice Hall, 2008.
2. Sandeep Chatterjee and James Webber, "Developing Enterprise Web Services: An Architect's Guide", Pearson Education, 2005.
3. Eric Newcomer and Greg Lomow, "Understanding SOA with Web Services", Addison Wesley, 2004.
4. Eric New Comer, "Understanding Web Services: XML, WSDL, SOAP and UDDI", Addison-Wesley, USA, 2002.

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Curriculum & Syllabus for B.Tech. (IT)   **Regulations-2011**

BIT012	KNOWLEDGE MANAGEMENT	L	T	P	C

3   0   0   3

OBJECTIVES
- To understand the basics of Knowledge Management
- To know the Knowledge Architecture and Models
- To know the Knowledge Capturing Techniques & technologies
- To become aware of Testing and Training in Knowledge management
- To understand the Knowledge Management Protocols & data mining tools

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 LIFECYCLE   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. Awad, Hassan M. Ghaziri - "Knowledge Management: Second Edition", Prentice Hall ISBN Learning, Private Limited, 2010.

REFERENCES
1. Guus Schreiber, Hans Akkermans, Anjo Anjewierden, Robert de Hoog, Nigel hadbolt, 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.

BIT013	**INFORMATION SECURITY**	L	T	P	C
		3	0	0	3

OBJECTIVES
- To understand the fundamentals of information security
- To know the Legal, Ethical and Professional issues in Information Security

UNIT I   FUNDAMENTALS   **9**
History, Basics of 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, Fourth Edition, 2011.

REFERENCES
1. Micki Krause, Harold F. Tipton, "Handbook of Information Security Management", Vol 1-3, CRC Press LLC, 2004.
2. C Stuart Mc Clure, Joel Scrambray, George Kurtz, "Hacking Exposed", Tata McGraw-Hill, 2003
3. Matt Bishop, "Computer Security Art and Science", Pearson/PHI, 2002.

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Curriculum & Syllabus for B.Tech. (IT)   Regulations-2011

BCS013	M-COMMERCE	L	T	P	C
	(Common to CSE & IT)	3	0	0	3

OBJECTIVES
- Recognize the business principles of M-Commerce
- Understand the various technical Support for M-Commerce
- Able to build business models using M-Commerce approaches

UNIT I   INTRODUCTION   9
Electronic Commerce Framework – Electronic Commerce and Media Convergence – Anatomy of E-Commerce Applications – Consumer Application – Electronic Commerce organization application.

UNIT II   NETWORK INFRASTRUCTURE   9
Introduction - Market forces influencing the I-Way - Components of the I-Way - Network access equipment - The Last Mile: Local Roads and Access Ramps - Global information distribution networks - Public policy issues shaping the i-way.

UNIT III   MOBILE COMMERCE TECHNOLOGY   9
NTT Docomos's I-Mode - Towards a Classification Framework for Mobile Location Based Services - Wireless Personal and Local Area Networks - The Impact of Technology Advances on Strategy Formulation in Mobile Communications Networks.

UNIT IV   MOBILE COMMERCE: THEORY AND APPLICATIONS   9
The Ecology of Mobile Commerce - The Wireless Application Protocol - Mobile Business Services - Mobile Portal - Factors Influencing the Adoption of Mobile Gaming Services - Mobile Data Technologies for Small Business Adoption and Diffusion.

UNIT V   BUSINESS-TO-BUSINESS MOBILE E-COMMERCE   9
A perspective on M-Commerce – Location based services: criteria for adoption and solution deployment - MCommerce in the automotive industry making a case for strategic partnerships- Case study:The Role of Mobile advertising in building a brand.

TOTAL: 45 PERIODS

TEXT BOOKS
1. Ravi Kalakota, B.Andrew Whinston, "Frontiers of Electronic Commerce", Pearson Education, Ninth Impression, 2009.
2. Brian E. Mennecke, Troy J. Strader, "Mobile Commerce: Technology, Theory and Applications", Idea Group Inc., IRM press, 2003.

REFERENCES
1. P. J. Louis, "M-commerce Crash Course", McGraw – Hill Companies, 2001.
2. Paul May, "Mobil Commerce: Opportunities, Applications, and Technologies of Wireless Business", Cambridge University Press, 2001.
3. Norman Sadeh, "M-Commerce:Technologies, Services and Business models", John Wiley & Sons, 2003
4. P.Candace Deans, "E-Commerce and M-Commerce Technologies", Idea Group Inc (IGI), 2005.

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Curriculum & Syllabus for B.Tech. (IT)   **Regulations-2011**

BCS015	**ADHOC NETWORKS**	**L**	**T**	**P**	**C**
	(Common to CSE & IT)	**3**	**0**	**0**	**3**

OBJECTIVES
- To impart the trends in emerging field of wireless networking.
- To focus on layered communication modeling, such as the media access control and network layer.
- To address quality of service issues and network reliability for transmission of real-time information.

UNIT I   FUNDAMENTALS   9
Introduction to Wireless Communication Technology – Characteristics of the Wireless Channel – IEEE 802.11a/b Standard – Origin of Adhoc Packet Radio Networks – Architecture of PRNETs – Introduction to Adhoc Wireless Networks – Heterogeneity in Mobile Devices – Introduction to Wireless Sensor Networks – Traffic Profiles – Types of Adhoc Mobile Communications –Adhoc wireless Internet.

UNIT II   ADHOC ROUTING PROTOCOLS   9
Introduction to designing a Routing Protocol – Classifications of Routing Protocols – Destination Sequenced Distance Vector (DSDV) – Wireless Routing Protocol (WRP) – Cluster Switch Gateway Routing (CSGR) – Source–Initiated On–Demand Approaches – Ad hoc On–Demand Distance Vector Routing (AODV) – Dynamic Source Routing (DSR) –Temporally Ordered Routing Algorithm (TORA) – Signal Stability Routing (SSR) –Location–Aided Routing (LAR) – Power–Aware Routing (PAR) – Zone Routing Protocol (ZRP).

UNIT III   MULTICAST ROUTING IN ADHOC NETWORKS   9
Introduction to designing a Multicast Routing Protocol – Operation of Multicast Routing Protocols — Classifications of Multicast Routing Protocols – Tree–Based Multicast Routing Protocols– Mesh–Based Multicast Routing Protocols – Summary of Tree and Mesh based Protocols – Energy–Efficient Multicasting – Multicasting with Quality of Service Guarantees – Application – Dependent Multicast Routing.

UNIT IV   TRANSPORT LAYER-SECURITY PROTOCOLS   9
Introduction to Transport Layer Protocol –Classification of Transport Layer Solutions – TCP over Adhoc Wireless Networks – Security in Adhoc Wireless Networks – Network Security Attacks – Key Management – Secure Routing.

UNIT V   QoS AND ENERGY MANAGEMENT   9
Introduction to QoS in Adhoc Wireless Networks –Classifications of QoS Solutions – MAC Layer Solutions – Network Layer Solutions – Energy Management — Classification of Energy Management Schemes – Transmission Power Management Schemes – System Power Management Schemes.

TOTAL: 45 PERIODS

TEXT BOOK
1.   C.Siva Ram Murthy and B. S. Manoj, "Ad Hoc Wireless Networks Architectures and Protocols", Prentice Hall, PTR, 2004.

REFERENCES
1.   C. K. Toh, "Ad Hoc Mobile Wireless Networks Protocols and Systems", Prentice Hall, PTR, 2002.
2.   Charles E. Perkins, "Ad Hoc Networking", Addison Wesley, 2000.

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Curriculum & Syllabus for B.Tech. (IT)   **Regulations-2011**

BCS027	NATURE AND BIO INSPIRED COMPUTING	L	T	P	C
	(Common to CSE & IT)	3	0	0	3

OBJECTIVES
- To acquire in-depth knowledge about the Nature and Bio inspired Computing.
- To introduce the students to biologically inspired computing.
- To uncover the state-of-the-art of present technology.
- To survey relevant theoretical models, reconfigurable architectures and computational intelligence techniques.

UNIT I   INTRODUCTION   9
Natural to Artificial Systems– Behavior of Social Insects: Foraging – Division of Labor — Cemetery Organization and Brood Sorting – Nest Building.

UNIT II   ANT COLONY OPTIMIZATION   9
Ant Behavior – Towards Artificial Ants– Ant Colony Optimization– Combinatorial Optimization-Meta-heuristic – Problem solving using ACO – Extensions of Ant Systems – Local search methods – ACO theoretical considerations – Convergence proofs.

UNIT III   APPLICATIONS   9
Ant Colony Optimization algorithms for NP-hard problems – Routing problems –Assignment problems – Scheduling problems – Subset problems – Machine Learning Problems – ACO for Traveling Salesman problem.

UNIT IV   SWARM INTELLIGENCE   9
Biological foundations of Swarm Intelligence – Swarm Intelligence in Optimization – Particle Swarms for dynamic optimization problems.

UNIT V   COMPUTING PARADIGMS   9
Biological Inspired computing to Natural Computing – Integration of Evolutionary Computation Components in Ant Colony Optimization – Particle Swarm Optimization based on Socio-cognition.

TOTAL: 45 PERIODS

TEXT BOOKS
1. Christian Blum, Daniel Merkle (Eds.), "Swarm Intelligence: Introduction and Applications", Springer Verlag, 2008.
2. Leandro N.De Castro, Fernando J.Von Zuben, "Recent Developments in Biologically Inspired Computing", Idea Group Inc., 2005.
3. Marco Dorigo, Thomas Stutzle, "Ant Colony Optimization", MIT Press, 2004.
4. Eric Bonabeau, Marco Dorigo, Guy Theraulaz, "Swarm Intelligence: From Natural to Artificial Systems", Oxford University press, 2000.

REFERENCES
1. James F.Kennedy, James Kennedy, Russell C. Eberhart, "Swarm Intelligence", Morgan Kaufmann, 2001.
2. Christian Blum, "Theoretical and practical Aspects of Ant Colony Optimization", IOS press, 2004.