Estd 1995

SETHU INSTITUTE OF TECHNOLOGY

(An Autonomous Institution)

Pulloor, Kariapatti – 626115.

B.TECH INFORMATION TECHNOLOGY

REGULATIONS 2013

CURRICULUM & SYLLABUS
(1st SEMESTER to 8th SEMESTER)

Approved in the Academic Council Meeting held on 16.07.2016

CHAIRMAN

ACADEMIC COUNCIL

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CHAIRMAN
BOARD OF STUDIES
DEPT. OF INFORMATION TECHNOLOGY

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SETHU INSTITUTE OF TECHNOLOGY

(An Autonomous Institution)

Estd.1995

REGULATIONS 2013

CURRICULUM AND SYLLABI FOR

B.TECH INFORMATION TECHNOLOGY

(FOR THE STUDENTS ADMITTED FOR THE ACADEMIC YEAR 2014-2015 ONWARDS)

SETHU INSTITUTE OF TECHNOLOGY

(An Autonomous Institution)

REGULATIONS 2013

Bachelor of Technology in Information Technology

OVERALL COURSE STRUCTURE

Category	Total No. of Courses	Credits	Percentage
Science & Humanities	16	42	22.5
Basic Engineering	8	22	11.5
Professional Subjects–CORE	40	107	56.5
Professional Subjects–ELECTIVE	6	18	09.5
TOTAL	70	189	100

COURSE CREDITS–SEMESTER WISE

Branch	I	II	III	IV	V	VI	VII	VIII	TOTAL
IT	26	26	25	27	26	25	22	12	189

Semester I

Course Code	Course Title	L	T	P	C
THEORY					
01UEN101	Technical English–I (Common to ALL Branches)	3	1	0	4
01UMA102	Engineering Mathematics- I (Common to ALL Branches)	3	1	0	4
01UPH103	Engineering Physics (Common to ALL Branches)	3	0	0	3
01UCY105	Applied Chemistry (Common to CSE,ICE,ECE,EEE,IT & EIE)	3	0	0	3
01UCS106	Computer Programming (Common to ALL Branches)	3	0	0	3
01UME107	Engineering Graphics (Common to ALL Branches)	2	0	3	4
PRACTICAL					
01UCS108	Computer Practice Laboratory –I (Common to ALL Branches)	0	0	3	2
01UME109	Engineering Practices Laboratory (Common to ALL Branches)	0	0	3	2
01UGS110	Physics & Chemistry Laboratory (Common to ALL Branches)	0	0	2	1
	TOTAL	17	2	11	26
Total No. of Credits - 26					

Semester II

Course Code	Course Title	L	T	P	C
THEORY					
01UEN201	Technical English– II (Common to ALL Branches)	3	1	0	4
01UMA202	Engineering Mathematics–II (Common to ALL Branches)	3	1	0	4
01UPH204	Applied Physics (Common to CSE,ICE,ECE,EEE,IT & EIE)	3	0	0	3
01UCY204	Environmental Science (Common to ALL Branches)	3	0	0	3
01UME205	Basic Civil and Mechanical Engineering (Common to ALL Branches)	4	0	0	4
01UCS207	Digital Principles and System Design (Common to CSE & IT)	3	0	0	3
PRACTICAL					
01UCS208	Digital Laboratory (Common to CSE & IT)	0	0	3	2
01UCS209	Computer Practice Laboratory–II (Common to ALL Branches)	0	0	3	2
01UGS210	Physics & Environmental Science Laboratory (Common to ALL Branches)	0	0	2	1
	TOTAL	19	2	8	26
Total No. of Credits - 26					

Semester III

Course Code	Course Title	L	T	P	C
THEORY					
01UMA321	Transforms and Partial Differential Equations (Common to ALL Branches)	3	1	0	4
01UIT302	Programming with Data Structures	3	0	0	3
01UIT303	Computer Organization	3	0	0	3
01UIT304	Object Oriented Programming (Common to CSE & IT)	3	0	0	3
01UIT305	Database Systems	3	0	0	3
01UIT306	Analog and Digital Communication	3	0	0	3
PRACTICAL					
01UIT307	Programming with Data Structures Laboratory	0	0	3	2
01UIT308	Object Oriented Programming Laboratory (Common to CSE & IT)	0	0	3	2
01UIT309	Database Systems Laboratory	0	0	3	2
VALUE ADDED COURSE					
01UGS331	Value Education and Human Rights (Common to ALL Branches)	2	0	0	P/F
	TOTAL	20	1	9	25
Total No. of Credits - 25					

Semester IV

Course Code	Course Title	L	T	P	C
THEORY					
01UMA421	Applied Statistics and Queuing Networks (Common to CSE & IT)	3	1	0	4
01UIT402	Analysis and Design of Algorithms	3	1	0	4
01UCS403	Java Programming (Common to CSE & IT)	3	0	0	3
01UIT404	Principles of Operating Systems	3	0	0	3
01UIT405	Object Oriented Software Engineering Methodologies	3	0	0	3
01UEC423	Microprocessors and Microcontrollers (Common to CSE & IT)	3	0	0	3
01UGS431	Qualitative and Quantitative Aptitude (Common to ALL Branches)	1	0	0	1
PRACTICAL					
01UCS407	Java Programming Laboratory (Common to CSE & IT)	0	0	3	2
01UIT408	Operating Systems Practice Laboratory	0	0	3	2
01UEC427	Microcontrollers and Microprocessors Laboratory (Common to CSE & IT)	0	0	3	2
	TOTAL	19	2	9	27
Total No. of Credits - 27					

Semester V

Course Code	Course Title	L	T	P	C
THEORY					
01UMA521	Discrete Mathematics (Common to CSE & IT)	3	1	0	4
01UIT502	Computer Networks (Common to CSE & IT)	3	0	0	3
01UCS503	Object Oriented Analysis and Design (Common to CSE & IT)	3	0	0	3
01UIT504	Embedded Computing Systems	3	0	0	3
01UIT505	Graphics with OPENGL	3	0	0	3
01UIT506	Wireless Communication	3	0	0	3
PRACTICAL					
01UIT507	Computer Networks Laboratory (Common to CSE & IT)	0	0	3	2
01UCS508	Object Oriented Analysis and Design Laboratory (Common to CSE & IT)	0	0	3	2
01UIT509	Graphics Programming Laboratory	0	0	3	2
01UGS531	Soft skills and Communication Laboratory (Common to CSE,ECE,EEE & IT)	0	0	2	1
	TOTAL	18	1	11	26
Total No. of Credits - 26					

Semester VI

Course Code	Course Title	L	T	P	C
THEORY					
01UIT601	Service Oriented Architecture	3	0	0	3
01UIT602	Compiler Design	3	0	0	3
01UIT603	Web Technology	3	0	0	3
01UIT604	Cryptography and Network Security	3	0	0	3
	Elective–I	3	0	0	3
	Elective– II	3	0	0	3
PRACTICAL					
01UIT607	Service Oriented Architecture Laboratory	0	0	3	2
01UIT608	Web Technology Laboratory	0	0	3	2
01UIT609	Network Security Laboratory	0	0	3	2
01UIT610	Mini Project / Technical Seminar	0	0	2	1
	TOTAL	18	0	11	25
Total No. of Credits - 25					

Semester VII

Course Code	Course Title	L	T	P	C
THEORY					
01UME701	Project Management and Finance	3	0	0	3
01UIT702	Advanced Database Systems	3	0	0	3
01UIT703	Mobile Communication Systems	3	0	0	3
01UIT704	High Performance Networks	3	0	0	3
	Elective III	3	0	0	3
	Elective IV	3	0	0	3
PRACTICAL					
01UIT707	Mobile Communication Systems Laboratory	0	0	3	2
01UIT708	Advanced Database Systems Laboratory	0	0	3	2
	TOTAL	18	0	6	22
Total No. of Credits - 22					

Semester VIII

Course Code	Course Title	L	T	P	C
THEORY					
	Elective V	3	0	0	3
	Elective VI	3	0	0	3
PRACTICAL					
01UIT803	Project Work	0	0	12	6
	TOTAL	6	0	12	12
Total No. of Credits - 12					

LIST OF ELECTIVES

Course Code	Course Title	L	T	P	C
01UIT901	Distributed Operating Systems	3	0	0	3
01UIT902	Modern Artificial Intelligence	3	0	0	3
01UIT903	Software Architecture	3	0	0	3
01UIT904	Agile Software Development	3	0	0	3
01UIT905	Intrusion Detection System	3	0	0	3
01UIT906	User Interface Framework Development	3	0	0	3
01UIT907	Management Information Systems	3	0	0	3
01UIT908	Grid and Cloud Computing	3	0	0	3
01UIT909	Data Analytics	3	0	0	3
01UIT910	Building Enterprise Applications	3	0	0	3
01UIT911	Adhoc and Sensor Networks	3	0	0	3
01UIT912	Principles of Software Testing	3	0	0	3
01UIT913	Intelligent Agents	3	0	0	3
01UIT914	System Software Internals	3	0	0	3
01UIT915	Bio Informatics	3	0	0	3
01UIT916	Digital Asset Management	3	0	0	3
01UIT917	Communication Protocols	3	0	0	3
01UIT918	FOSS for Enterprise Applications	3	0	0	3
01UIT919	Social Network Analysis	3	0	0	3
01UIT920	Ethical Hacking and Information Forensics	3	0	0	3
01UIT921	Data Mining Concepts and Techniques	3	0	0	3
01UIT922	Satellite Communication and Broadcasting	3	0	0	3
01UCS902	Information Storage Management	3	0	0	3
01UEC953	Coding and Information Theory	3	0	0	3

Note: Student may choose any one of the electives offered by the other branch of study.

SEMESTER I

Course Code	Course Title	L	T	P	C
THEORY					
01UEN101	Technical English–I (Common to ALL Branches)	3	1	0	4
01UMA102	Engineering Mathematics- I (Common to ALL Branches)	3	1	0	4
01UPH103	Engineering Physics (Common to ALL Branches)	3	0	0	3
01UCY105	Applied Chemistry (Common to CSE,ICE,ECE,EEE,IT & EIE)	3	0	0	3
01UCS106	Computer Programming (Common to ALL Branches)	3	0	0	3
01UME107	Engineering Graphics (Common to ALL Branches)	2	0	3	4
PRACTICAL					
01UCS108	Computer Practice Laboratory –I (Common to ALL Branches)	0	0	3	2
01UME109	Engineering Practices Laboratory (Common to ALL Branches)	0	0	3	2
01UGS110	Physics & Chemistry Laboratory (Common to ALL Branches)	0	0	2	1
	TOTAL	17	2	11	26
Total No. of Credits - 26					

TECHNICAL ENGLISH - I

01UEN101	L	T	P	C
(Common to ALL Branches)				
	3	1	0	4

COURSE OBJECTIVE:

- To improve the language proficiency of students
- To enhance the vocabulary of students
- To strengthen the language competency through grammar

UNIT I **9+3**

Listening-Conversation Practice; Speaking-Observing the diagram and speaking on the topic, Explaining daily routines; **Reading**- Reading Comprehension, Referring to the Dictionary and identifying the functions of words; **Writing**- Paragraph Writing(Writing for a given situation); Grammar- Parts of Speech, Introduction of Present Tense and its four sub divisions; **Vocabulary**- Prefix and Suffix, Synonyms and Antonyms

UNIT II **9+3**

Listening- Listening to Inspiring Speeches and Instructions; **Speaking**- Narrating Stories, Self Introduction; **Reading**-Reading Short Stories, Newspaper Articles, Skimming; **Writing**- Summary Writing, Hints Developing, Letter Writing-Informal Letters; **Gramma**r- Introduction of Past Tense and its four sub divisions, Voice- Active and Passive-Conversion of Assertive Sentences; Punctuation & Spelling, **Vocabulary** - Homonyms and Homophones, Idioms and Phrases

UNIT III **9+3**

Listening- Completing the task of drawing a diagram based on instructions; **Speaking**- Review of a Movie, Seeking Permission, **Reading**- Note Making Skills, **Writing**- Letter Writing-Formal Letters-Letter to the Editor; **Gramma**r- Introduction of Future Tense and its four sub divisions, Subject-Verb Agreement, Voice- Active and Passive-Conversion of Interrogative and Imperative Sentences; **Vocabulary**- British and American Words.

UNIT IV **9+3**

Listening- Comprehension Passage, Tracing geographical locations through instructions; **Speaking**- Explaining Pictures of their choice, Making Requests; **Reading**- Reading Profiles of Leading Companies and Personalities; **Writing**- Writing Review of a Book/ Movie/ Journal, Report Writing; **Grammar**- Regular and Irregular Verbs, Instructions, Connectives-Discourse Markers; **Vocabulary**- Foreign Words

UNIT V **9+3**

Listening- Listening to informal conversations and participating; **Speaking-** Expressing Opinions , Asking for directions using polite expressions, Giving directions by using imperative sentences; **Reading**- Reading Job Advertisements, Skimming and Scanning; **Writing**- Process Description; Grammar- Numerical Adjectives, Sequencing Words, Spelling; **Vocabulary**- One Word Substitutions

Total: 45+15 Periods

LEARNING OUTCOMES:

After successful completion of this course the students will be able to:

- Use grammar effectively in writing meaningful sentences and paragraphs.
- Exhibit improved reading comprehension and vocabulary.
- Demonstrate writing skills in various formal situations.
- Demonstrate improved oral fluency.
- Presenting reports on various purposes.

TEXT BOOKS:

1. Humanities and Social Sciences Division, Anna University. “English for Engineers and Technologists”, Vol. 1, Orient Longman, Chennai, 2002.
2. Meenakshi Raman and Sangeeta Sharma, “Technical Communication: Prinicples and Practice”, Second Edition, Oxford University Press, India, 2012.
3. Ashraf Rizvi M., “Effective Technical Communication”, Tata McGraw-Hill, New Delhi ,2005.

SUGGESTED BOOK FOR READING:

1. Shanta Rameshwar Rao, “Perceptions”, Orient Longman Pvt. Ltd., Chennai, 2002

REFERENCE BOOKS:

1. Curriculum Development Centre, TTTI, “Communication in English for Technical Students” Orient Longman, Calcutta, 1984.
2. Sidney Greenbaum, “The Oxford English Grammar(H)” Oxford University Press, 1996.

01UMA102	ENGINEERING MATHEMATICS – I (Common to ALL Branches)	L	T	P	C
		3	1	0	4

COURSE OBJECTIVE:

- To identify algebraic eigen value problems from practical areas and obtain the eigen solutions in certain cases
- To study three dimensional analytical geometry, the properties of lines and planes in space
- To understand effectively the geometrical aspects of curvature, involutes and evolutes of plane curves, essential concepts for an engineer, as elegant applications of differential calculus
- To learn the method of solving differential equations of certain types, including systems of differential equations that they might encounter in their studies of other subjects in the same or higher semesters.

UNIT I MATRICES **8+3**

Eigenvalue and eigenvector of a real matrix – Characteristic equation – 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 **9+3**

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 **8+3**

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 **8+3**

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 **9+3**

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

SUPPLEMENT TOPIC: **3**

Evocation / Application of Mathematics, Quick Maths – Speed Multiplication and Division (for internal evaluation only)

Total: L + T: 45 + 15 = 60 Periods

LEARNING OUTCOMES:

After successful completion of this course the students will be able to:

- Find the derivative of the given function and its successive differentiation.
- Predict the extreme values of functions with constraints and fine the absolute maximum and minimum of a given function on different domains.
- Apply the various methods of integration for evaluating definite integrals.
- Demonstrate the use of double and triple integrals to compute area and volume.
- Find inverse and positive power of given matrix using Cayley Hamilton Theorem andreduce to canonical form by orthogonal transformation.

TEXT BOOKS:

1. Bali N.P. and Manish Goyal, “Text book of Engineering Mathematics”, Third edition, Laxmi Publications(P) Ltd., 2008.
2. Grewal. B.S., “Higher Engineering Mathematics”, 42 nd Edition, Khanna Publications, Delhi, 2012.

REFERENCE BOOKS:

1. Ramana B.V., “Higher Engineering Mathematics”, 11 th Reprint, Tata McGraw Hill Publishing Company, New Delhi, 2010.
2. Glyn James, “Advanced Engineering Mathematics”, Seventh Edition, Pearson Education, 2007.
3. Jain R.K. and Iyengar S.R.K., “Advanced Engineering Mathematics”, Third Edition, Narosa Publishing House Pvt. Ltd., 2007.

01UPH103	ENGINEERING PHYSICS (Common to ALL Branches)	L	T	P	C
		3	0	0	3

COURSE OBJECTIVE:

- To have a clear knowledge of principles and applications of ultrasonics
- To understand the working method of different kinds of laser
- To learn the types of fibre and communication applications
- To know the basic principles of Quantum theory
- To develop the fundamental research interest in crystal physics

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 coefficients -derivation. Types of lasers –, Nd-YAG- CO2 and Semiconductor lasers (homo-junction & hetero-junction) - Qualitative Industrial Applications - Lasers in welding, heat treatment, cutting – Medical applications - Holography (construction & reconstruction)

UNIT III FIBER OPTICS AND APPLICATIONS **9**

Introduction – Structure of optical fibre- Principle and propagation of light in optical fibres – Numerical aperture and Acceptance angle - Types of optical fibres (material, refractive index, modes)-Double crucible technique of fibre drawing - Splicing, Loss in optical fibre – attenuation, dispersion, bending Fibre optical communication system (Block diagram) – fibre optic sensors- Endoscope

UNIT IV QUANTUM PHYSICS **9**

Black body radiation – Planck"s theory (derivation) – Wien"s displacement law and Rayleigh – Jeans" Law – 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

LEARNING OUTCOMES:

After successful completion of this course the students will be able to:

- Analyze the basic concepts of crystalline materials and the various crystal Structure like FCC, BCC, HCP etc.
- Apply the ultrasonic concepts in different industries for the development of different instruments which has practical applications in submarine to aerospace applications.
- Demonstrate understanding of and be able to solve problems on operations and basic properties of the laser types like CO2 laser,diode laser etc.,
- Apply the quantum mechanical model to explain the behaviour of a system at microscopic level
- Explain the behaviour of bending beams and calculate the expression for young's modulus

TEXT BOOKS:

1. Dr. Mani P.A., "Text Book of Engineering Physics", Dhanam Publications, Ninth Edition, Chennai, 2011.
2. Rajendran V., "Engineering Physics", Tata Mc-Graw Hill Publishing company limited, New Delhi, 2011.
3. Gaur R.K. and Gupta S.L., "Engineering Physics", Dhanapat Rai Publications, New Delhi, 2011.

REFERENCE BOOKS:

1. Raghuvenshi G.S., "Engineering Physics", PHI Learning Private Limited, New Delhi, 2010.
2. Arul doss G., "Engineering Physics", PHI Learning Private Limited, New Delhi, 2010.
3. Marikani A., "Engineering Physics", PHI Learning Private Limited, New Delhi, 2009.
4. Sankar B.N., and Pillai.S.O., "A Text Book of Engineering Physics", New Age International Publishers Private Limited, New Delhi, 2007.
5. Dr. Avadhanulu M.N. and Mulajkar D.D., "Engineering Physics", S. Chand and company Ltd., New Delhi, 2009.
6. Vanchana Singh and Sheetal Kumar, "Engineering Physics", Cengage Learning India Pvt. Ltd., New Delhi, 2010.

01UCY105	APPLIED CHEMISTRY (Common to CSE, ICE, ECE, EEE, IT & EIE)	L	T	P	C
		3	0	0	3

COURSE OBJECTIVE:

- To know about the principles of electrochemistry, emf and applications of emf measurements
- To understand the basics of photochemistry
- To learn about corrosion control methods
- To know about the industrial applications of surface chemistry
- To learn the analytical techniques and their importance

UNIT I ELECTRO CHEMISTRY 9

Electrode – single electrode potential, Nernst equation (problem), reference electrodes - standard hydrogen electrode – calomel electrode, glass electrode, measurement of pH; cells – EMF – measurement of emf, reversible and irreversible cells, electrolyte concentration cells and applications, electrochemical series – significance, potentiometeric titrations (redox - Fe^{2+}vs dichromate and precipitation – Ag^{+} vs. CI^{-} titrations) and Conductometric titrations (HCI vs. NaOH).

UNIT II PHOTO CHEMISTRY 9

Photochemical reaction: classification - thermal and photochemical reactions; laws of photochemistry - Grothus –Droper Law, Stark Einstein Law (problems); Quantum yield and determination (problems); photochemical synthesis of HCl and HBr – Jablonski diagram; fluorescence and phosphorescence, chemiluminescence, photosensitisation, applications; photosynthesis, photoinhibitors; applications in chemical synthesis, photo lithography and thin film coating.

UNIT III CORROSION AND CORROSION CONTROL 9

Corrosion: Types - Chemical and electrochemical – mechanisms; different forms – galvanic, pitting, stress corrosion cracking and differential aeration corrosion; factors influencing corrosion; corrosion control – sacrificial anode and impressed cathodic current methods, corrosion inhibitors; protective coatings: paints – constituents and functions; metallic coatings – electroplating of Au and electroless plating of Ni.

UNIT IV SURFACE CHEMISTRY 9

Adsorption: types – physical and chemical adsorption, adsorption of gases on solids; adsorption isotherms – Freundlich and Langmuir isotherms; adsorption of solutes from solution; ion -exchange adsorption; adsorption in pollution abatement (Granular activated carbon and powdered activated carbon); removal of heavy metals from effluents-coagulation, sedimentation and filtration; catalysis-characteristics, autocatalysis, catalytic poisoning and promoters

UNIT V INSTRUMENTAL METHODS OF CHEMICAL ANALYSIS 9

Beer-Lambert"s law: definition, derivation and simple problems– UV-visible – types of transitions, chromophores and auxochromes, Instrumentation (block diagram only), applications-Estimation of iron, AAS - principle - Instrumentation- (block diagram only)- applications-Estimation of nickel, Flame photometry- principle - Instrumentation- (block diagram only)- applications-Estimation of sodium; XRD: principle and applications

Total: 45 Periods

LEARNING OUTCOMES:

After successful completion of this course the students will be able to:

- Understand emf and its measurements, electrodes etc, which boost up their skill in circuit development for different applications.
- Gain knowledge about the materials that can be used to protect the electronic devices.
- Treat complex electrical/electronic systems and signals through modeling, simulation, experimentation and interpretation and analysis of data.

TEXT BOOKS:

1. Jain P.C. and Monica Jain, "Engineering Chemistry", DhanpatRai Pub., Co., New Delhi, 2002.
2. Kannan P. and Ravikrishnan A., "Engineering Chemistry**",** Sri Krishna Hitech Publishing Company Pvt. Ltd**,** Chennai**,** 2009.
3. Dara S.S., "A text book of engineering chemistry", S.Chand & Co. Ltd., New Delhi, 2006.
4. Rohatgi K.K. and Muherjee, "Fundamentals of Photochemistry", New Age International Publications, New Delhi, 2006.

REFERENCE BOOKS:

1. Sharma B.K., "Engineering Chemistry", Krishna Prakasan Media (P) Ltd., 2001.
2. Sivasankar B., "Engineering Chemistry", Tata McGraw-Hill Pub. Co. Ltd., New Delhi, 2008.
3. Sharma B.K., "Instrumental Methods of Chemical Analysis", Goel Publishing House, Meerut, 2005.
4. Gurdeep Chatwal, "Surface Chemistry", Goel Publishers, Meerut, 2002.
5. The Fu Yen, "Surface Chemistry for Engineers", Imperial College Press, London, 2008.

01UCS106 **COMPUTER PROGRAMMING**

(Common to ALL Branches)

L	T	P	C
3	0	0	3

COURSE OBJECTIVE:

- To enable the students to read and write C programs
- To understand the organization of computers
- To learn about the programming constructs of C

UNIT I INTRODUCTION **8**

Generation and Classification of Computers- Basic Organization of a Computer –Number System – Binary – Decimal – Conversion – Problems. Need for logical analysis and thinking – Algorithm – Pseudo code – Flow Chart.

UNIT II C PROGRAMMING BASICS **10**

Problem formulation – Problem Solving - Introduction to „ C" programming – fundamentals – structure of a „C" program – compilation and linking processes – Constants, Variables – Data Types – Expressions using operators in „C" – Managing Input and Output operations – Decision Making and Branching – Looping statements – solving simple scientific and statistical problems.

UNIT III ARRAYS AND STRINGS **9**

Arrays – Initialization – Declaration – One dimensional and Two dimensional arrays. String- String operations – String Arrays. Simple programs- sorting- searching – matrix operations.

UNIT IV FUNCTIONS AND POINTERS **9**

Function – definition of function – Declaration of function – Pass by value – Pass by reference – Recursion – Pointers - Definition – Initialization – Pointers arithmetic – Pointers and arrays- Dynamic Memory allocation– Example Problems.

UNIT V STRUCTURES ,UNIONS AND FILE HANDLING **9**

Introduction – need for structure data type – structure definition – Structure declaration – Structure within a structure - Union - Programs using structures and Unions – Storage classes, Pre-processor directives –File handling.

Total: 45 Periods

LEARNING OUTCOMES:

After successful completion of this course the students will be able to:

- Illustrate the basics about computer
- Develop simple programs
- Develop simple programs using branching and looping constructs.
- Write C program using arrays, strings and functions.
- Write C programs for simple applications

TEXT BOOKS:

1. Anita Goel and Ajay Mittal, “Computer Fundamentals and Programming in C”, Dorling Kindersley (India) Pvt. Ltd, Pearson Education in South Asia, 2011.
2. Pradip Dey and Manas Ghosh, “Fundamentals of Computing and Programming in C”, Oxford University Press, First Edition, 2009.
3. Yashavant P. Kanetkar. “Let Us C”, BPB Publications, 2011.

REFERENCE BOOKS:

1. Byron S.Gottfried, “Programming with C”, Schaum‟s Outlines, Tata McGraw-Hill, Second Edition, 2006.
2. Dromey R.G., “How to Solve it by Computer”, Pearson Education, Fourth Reprint, 2007.
3. Kernighan B.W. and Ritchie.D.M., “The C Programming language”, Pearson Education, Second Edition, 2006.
4. Balagurusamy E., “Computing fundamentals and C Programming”, Tata McGraw- Hill Publishing Company Limited, 2008.
5. Stephen G.Kochan, “Programming in C”, Pearson Education India, Third Edition, 2005.

01UME107	ENGINEERING GRAPHICS (Common to ALL Branches)	L	T	P	C
		2	0	3	4

COURSE OBJECTIVE:

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

CONCEPTS AND CONVENTIONS (NOT FOR EXAMINATION) **1**

Importance of Graphics in Engineering Applications – Use of Drafting Instruments – BIS Conventions and Specifications – Size, Layout and Folding of Drawing Sheets – Lettering and Dimensioning

UNIT I PLANE CURVES AND FREE HAND SKETCHING **15**

Curves used in engineering practices: (Not for Examination)

Conics – Construction of ellipse, Parabola and hyperbola by eccentricity method – Construction of cycloid – construction of involutes of squad and circle – Drawing of tangents and normal to the above curves.

Orthographic Projection:

Representation of Three Dimensional objects – General principles of orthographic projection – Need for importance of multiple views and their placement – First angle projection – layout views – Developing visualization skills through free hand sketching of multiple views from pictorial views of objects.

UNIT II PROJECTION OF POINTS, LINES AND PLANE SURFACES **14**

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

UNIT III PROJECTION OF SOLIDS **15**

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

UNIT IV SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES **15**

Sectioning of above solids in simple vertical position by cutting planes inclined to one reference plane and perpendicular to the other – Obtaining true shape of section.

Development of lateral surfaces of simple and truncated solids – Prisms, pyramids, cylinders and cones.

UNIT V ISOMETRIC AND PERSPECTIVE PROJECTIONS 15 ISOMETRIC PROJECTIONS

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

PERSPECTIVE PROJECTIONS (Not for Examination)

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

Total: 75 Periods

LEARNING OUTCOMES:

After successful completion of this course the students will be able to:

- Understand the basics of orthographic and isometric projections
- Generate engineering drawing and relate it to day to day life
- Apply this basic knowledge throughout the carrier

TEXT BOOKS:

1. Seeni Kannan P., Pitchayya Pillai G., and Arun Balasubramanian K., "Engineering Graphics", Little Moon Publication, 2012.
2. Bhatt N.D., "Engineering Drawing", 46th Edition, Charotar Publishing House, 2003.

REFERENCE BOOKS:

1. Natarajan K.V., "A Text book of Engineering Graphics", Dhanalakshmi Publishers, 2006.
2. Venugopal K., and Prabhu Raja V., "Engineering Graphics", New Age International (P) Limited, 2008.
3. Gopalakrishnana K.R., "Engineering Drawing" (Vol.I&II), Subhas Publications,1998.
4. Dhananjay A.Jolhe, "Engineering Drawing with an introduction to AutoCAD", Tata McGraw Hill Publishing Company Limited, 2008.
5. Basant Agarwal and Agarwal C.M., "Engineering Drawing", Tata Mc-Graw Hill Publishing Company Limited, New Delhi,2008.

Publication of Bureau of Indian Standards:

1. IS 10711 – 2001: Technical products Documentation – Size and lay out of drawing sheets.
2. IS 9609 (Parts 0 & 1) – 2001: Technical products Documentation – Lettering.
3. IS 10714 (Part 20) – 2001 & SP 46 – 2003: Lines for technical drawings.
4. IS 11669 – 1986 & SP 46 – 2003: Dimensioning of Technical Drawings.
5. IS 15021 (Parts 1 to 4) – 2001: Technical drawings – Projection Methods.

Special points applicable to End Semester Examinations on Engineering Graphics:

1. There will be five questions, each of either or type covering all units of the syllabus.
2. All questions will carry equal marks of 20 each making a total of 100.
3. The answer paper shall consist of drawing sheets of A3 size only. The students will be permitted to use appropriate scale to fit solution within A3 size.
4. Whenever the total number of candidates in a college exceeds 150, the End Semester Examination in that college will be conducted in two sessions (FN and AN on the same day) for 50 percent of student (approx) at a time.

01UCS108	COMPUTER PRACTICE LABORATORY – I (Common to ALL Branches)	L	T	P	C
		0	0	3	2

LIST OF EXPERIMENTS

a) Word Processing 15

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

b) Spread Sheet

5. Chart - Line, XY, Bar and Pie.
6. Formula - formula editor.
7. Spread sheet - inclusion of object, Picture and graphics, protecting the document and sheet.
8. Sorting and Import / Export features.

c) Power point

9. Simple presentation using power point

d) Simple C Programming 30

10. Data types, Expression Evaluation, Condition Statements.
11. Arrays
12. Structures and Unions
13. Functions
14. Files

COURSE OUTCOMES

After successful completion of this course the students will be able to:

- Create the document in Word Processing software.
- Write programs using control constructs.
- Apply functions to reduce redundancy.
- Design and implement C programs for simple applications

Total: 45 Periods

01UME109	ENGINEERING PRACTICES LABORATORY (Common to ALL Branches)	L	T	P	C
		0	0	3	2

LIST OF EXPERIMENTS

GROUP A (CIVIL & MECHANICAL)

I CIVIL ENGINEERING PRACTICE **9**

BUILDINGS:

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

PLUMBING WORKS:

(a) Study of pipeline joints, its location and functions: valves, taps, couplings, unions, reducers, elbows in household fittings.
(b) Study of pipe connections requirements for pumps and turbines.
(c) Preparation of plumbing line sketches for water supply and sewage works.
d) Hands-on-exercise:
Basic pipe connections–Mixed pipe material connection Pipe connections with different joining components.
(e) Demonstration of plumbing requirements of high-rise buildings.

CARPENTRY USING POWER TOOLS ON

(a) Study of the joints in roofs, doors, windows and furniture.
(b) Hands-on-exercise:
Wood work, joints by sawing, planning and cutting.

II MECHANICAL ENGINEERING PRACTICE **13**

Welding:
(a) Preparation of arc welding of butt joints, lap joints and tee joints.
(b) Gas welding practice.
Basic Machining:
(a) Simple Turning and Taper turning.
(b) Drilling Practice
Sheet Metal Work:
(a) Forming & Bending.
(b) Model making – Trays, funnels, etc.
(c) Different type of joints.
Machine assembly practice:
(a) Study of centrifugal pump
(b) Study of air conditioner
Demonstration on:
(a) Smithy operations, upsetting, swaging, setting down and bending.
Example – Exercise – Production of hexagonal headed bolt.
(b) Foundry operations like mould preparation for gear and step cone pulley.
(c) Fitting – Exercises – Preparation of square fitting and vee – fitting models.

GROUP B (ELECTRICAL & ELECTRONICS)

III ELECTRICAL ENGINEERING PRACTICE **10**

(a) Residential house wiring using switches, fuse, indicator, lamp and energy meter.
(b) Fluorescent lamp wiring.
(c) Stair case wiring.
(d) Measurement of electrical quantities – voltage, current, power & power factor in RLC circuit.
(e) Measurement of energy using single phase energy meter.
(f) Measurement of resistance to earth of electrical equipment.

IV ELECTRONICS ENGINEERING PRACTICE **13**

(a) Study of Electronic components and equipments – Resistor, colour coding measurement of AC Signal parameter (peak-peak, rms, period, frequency) using CRO.
(b) Study of logic gates
(c) Generation of Clock Signal.
(d) Soldering practice – Components, Devices and Circuits – Using general purpose PCB.
(e) Measurement of ripple factor of HWR and FWR.

Course Outcomes:

After successful completion of this course the students will be able to:

- Organize the day to day work(basic work) that are carried out in industries, building constructions and also is in real life
- Perform basic plumbing work and carpentry work
- Execute the welding, basic machining, sheet metal work, basic wiring, soldering etc.
- Demonstrate the basic engineering work to others
- Solve the problems that are encountered in basic engineering work.

Total: 45 Periods

01UGS110	PHYSICS & CHEMISTRY LABORATORY (Common to ALL Branches)	L	T	P	C
		0	0	2	1

PHYSICS LABORATORY

List of Experiments

1. Semiconductor Laser - Particle size determination using Diode Laser.
2. Determination of thickness of a thin wire – Air wedge method.
3. Determination of wavelength of mercury spectrum – Spectrometer grating.
4. Determination of Young‟s modulus of the material – Uniform bending.
5. Torsional pendulum – Determination of rigidity modulus of a given wire and Moment of inertia of a metallic disc.
6. Determination of Young‟s modulus of the material –Non uniform bending.
   - **A minimum of five experiments shall be offered**

CHEMISTRY LABORATORY

List of Experiments

1. Estimation of Copper in brass by EDTA
2. Conductometric titration (simple acid base)
3. Conductometric titration (Mixture of weak and strong acids)
4. Conductometric titration ($BaCl_2$ Vs Na_2SO_4)
5. Potentiometric titration (Fe^{2+} / $KMnO_4$ or $K_2Cr_2O_7$)
6. pH titration (acid & base)
7. Determination of molecular weight of a Polyvinyl Alcohol by Viscometry method
   - **A minimum of five experiments shall be offered**

Course Outcomes:

After successful completion of this course the students will be able to:

- Determine the velocity and compressibility of liquid
- Calculate the moment of inertia and rigidity modulus
- Determine the molecular weight of the polymer and composition of alloys
- Determine the accurate endpoint in volumetric analysis using analytical instruments
- Determine the acidic and basic nature of the solution using pH meter

Total: 30 Periods

SEMESTER II

Course Code	Course Title	L	T	P	C
THEORY					
01UEN201	Technical English– II (Common to ALL Branches)	3	1	0	4
01UMA202	Engineering Mathematics–II (Common to ALL Branches)	3	1	0	4
01UPH204	Applied Physics (Common to CSE,ICE,ECE,EEE,IT & EIE)	3	0	0	3
01UCY204	Environmental Science (Common to ALL Branches)	3	0	0	3
01UME205	Basic Civil and Mechanical Engineering (Common to ALL Branches)	4	0	0	4
01UCS207	Digital Principles and System Design (Common to CSE & IT)	3	0	0	3
PRACTICAL					
01UCS208	Digital Laboratory (Common to CSE & IT)	0	0	3	2
01UCS209	Computer Practice Laboratory–II (Common to ALL Branches)	0	0	3	2
01UGS210	Physics & Environmental Science Laboratory (Common to ALL Branches)	0	0	2	1
	TOTAL	19	2	8	26
Total No. of Credits - 26					

01UEN201	TECHNICAL ENGLISH – II (Common to ALL Branches)	L	T	P	C
		3	1	0	4

COURSE OBJECTIVE:

- To help the students acquire listening and speaking skills in their real life situations
- To develop professional skills for emancipation of students' Personality

UNIT I **9+3**

Listening- Listening to Telephonic Conversations; Speaking- Offering Suggestions, Introducing others; Reading- Skimming, Scanning and Skipping; Writing-Formal Letters-Writing letters to Head of the Institution; Grammar-Prepositions, Conjunctions, Infinitives; Vocabulary-Prepositional Phrases.

UNIT II **9+3**

Listening- Performing Various Tasks Based on Audio Tracks; Speaking- Role Play Practice, Jargons - Expression used to Define Technical Vocabulary; Reading- Fast Reading; Writing-Minutes of the Meeting, Preparing Agenda; Grammar- Direct and Indirect Speech, Conditional Clauses, Gerunds and Participles, Vocabulary- Collocations.

UNIT III **9+3**

Listening- Introduction to Phonetic Symbols ; Speaking- Speaking sentences with Stress and Intonations; Reading-Cloze Test ; Writing- Writing a Lab Report, Persuasive Paragraph writing; Grammar-Framing Questions, Types of Sentences; Vocabulary- Compound Nouns, Matching Words with meanings

UNIT IV **9+3**

Listening- Listening and Guided Note Taking; Speaking- Persuasive Strategies, Presentations of Problems and Solutions, Reading- Contextual Reading, Anthology of Short Stories and poems; Writing- Letter Writing (Inviting, Accepting and Declining), ; Grammar- Modal verbs, Articles; Sentence Completion; Vocabulary- Derivatives of Root Words.

UNIT V **9+3**

Listening- Critical Analysis of Presentation and Group Discussion; Speaking- Interview Skills; Reading- Editing the E-mail after Reading the Context; Writing-Writing Recommendations and Job Application with Resume; Grammar- Simple, Compound and Complex sentences, Vocabulary- Words Often Confused and Misused

Total: 45+15 Periods

LEARNING OUTCOMES:

After successful completion of this course the students will be able to:

- Read, understand, analyse and discuss technical papers
- Participate confidently and effectively in group discussion
- Write clear and concise technical paper, resume, report and email.
- Demonstrate comprehension of content and vocabulary

TEXT BOOKS:

1. Humanities and Social Sciences Division, Anna University, “English for Engineers and Technologists. Vol. 1”, Orient Longman, Sixth Edition, Chennai, 2002.
2. Meenakshmi Raman and Sangeeta Sharma, “Technical Communication: English Skills for Engineers”, Oxford University press, 2008.
3. Ashraf Rizvi M., “Effective Technical Communication”, Tata McGraw-Hill, Ninth Edition, New Delhi, 2005.

SUGGESTED BOOK FOR READING:

1. Mark Twain, “The Adventures of Tom Sawyer”, Penguin Classics, 2006.

REFERENCE BOOKS:

1. Curriculum Development Centre, TTTI, “Communication in English for Technical Students”, Orient Longman, Calcutta, 1984.
2. Sidney Greenbaum, “Oxford English Grammar”, Oxford University Press, First Edition, New Delhi, 2008.

01UMA202	ENGINEERING MATHEMATICS – II (Common to ALL Branches)	L	T	P	C
		3	1	0	4

COURSE OBJECTIVE:

- To study the basics of vector calculus comprising of gradient, divergence and curl, and line, surface and volume integrals and the classical theorems involving them
- To understand analytic functions and their interesting properties which could be concentrated in a few engineering areas, and be introduced to the host of conformal mappings with a few standard examples that have direct application
- To acquire knowledge of Laplace transform and its properties and sufficient exposure to solution of certain linear differential equations using the laplace transform technique

UNIT I ORDINARY DIFFERENTIAL EQUATIONS 8+3

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 8+3

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

UNIT III ANALYTIC FUNCTIONS 8+3

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 9+3

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 9+3

Existence conditions – 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.

SUPPLEMENT TOPIC: **3**

Evocation / Application of Mathematics, Arithmetical Ability – Time and Work – Time and Distance (for internal evaluation only)

Total: L + T: 45 + 15 = 60 Periods

LEARNING OUTCOMES:

After successful completion of this course the students will be able to:

- Solve first and higher order ordinary differential equations analytically and able to apply differential calculus to solve engineering problems.
- Find the integral value using the suitable method like Greens Theorem, Gauss divergence Theorem, Stokes Theorem.
- Construct an analytic function using various methods .Also able to convert a function from one domine to another domine using bilinear transformation.
- Evaluate the values of a contour integral around a given contour in the complex plane.
- Apply Laplace transform to solve Ordinary differential equations.

TEXT BOOKS:

1. Bali N.P. and Manish Goyal, "Text book of Engineering Mathematics", Third Edition, Laxmi Publications (P) Ltd, 2008.
2. Grewal B.S., "Higher Engineering Mathematics", 42 nd Edition, Khanna Publications, 2012

REFERENCE BOOKS:

1. Ramana B.V.,"Higher Engineering Mathematics", 11 th Reprint, Tata Mc-Graw Hill Publishing Company, New Delhi, 2010.
2. Glyn James, "Advanced Engineering Mathematics", Third Edition, Pearson Education, 2007.
3. Erwin Kreyszig, "Advanced Engineering Mathematics", Tenth Edition, Wiley India, 2011.
4. Jain R.K. and Iyengar S.R.K., "Advanced Engineering Mathematics", Third Edition, Narosa Publishing House Pvt. Ltd, 2007
5. Agarwal R.S., "Quantitative Aptitude", S.Chand Publications

01UPH204	APPLIED PHYSICS (Common to CSE, ICE, ECE, EEE, IT & EIE)	L	T	P	C
		3	0	0	3

COURSE OBJECTIVE:

- To get a clear knowledge of principles and applications of conducting materials
- To understand the principles and working knowledge semiconductor
- To know the basic principles of magnetic materials and superconductivity
- To know the basic principles optical materials and dielectrics
- To develop the fundamental research interest in nano materials

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 in n-type and p-type semiconductor – Fermi level – Variation of Fermi level with temperature – extrinsic semiconductors – carrier concentration derivation in n-type and p-type semiconductor – variation of Fermi level with temperature and impurity concentration – Hall effect –Determination of Hall coefficient – Applications

UNIT III MAGNETIC MATERIALS AND SUPERCONDUCTIVITY **9**

Origin of magnetic moment – Bohr magnetron – Dia and para magnetism – Ferro magnetism – Domain theory – Hysteresis – soft and hard magnetic materials – antiferromagnetic 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

UNIT IV OPTICAL MATERIALS AND DIELECTRIC MATERIALS **9**

Optical properties of metals, insulator and Semiconductor-Phosphorescence and fluorescence-Excitons, traps and colourcentres and their importance-different phosphors used in CRO screen-Liquid crystal as display material-Thermography and its applications.Dielectric Materials: Electrical susceptibility-Dielectric constant-Electronic,ionic,orientational and space charge polarization-Frequency and temperature dependence of polarization-Internal field-Claussius Mosotti relation(Derivation)

UNIT V NEW ENGINEERING MATERIALS **9**

Metallic glasses, preparation, properties and applications- Shape memory alloys (SMA): Characteristics, properties, application, advantages. Nanomaterials: synthesis –plasma arcing – chemical vapour deposition –electro deposition-solgels – ball milling - properties of nanoparticles and applications- Introduction to Carbon nanotubes

Total: 45 Periods

LEARNING OUTCOMES:

After successful completion of this course the students will be able to:

- Analyze the basic concepts of crystalline materials and the various crystal Structure like FCC, BCC, HCP, etc.
- Apply the ultrasonic concepts in different industries for the development of different instruments which has practical applications in submarine to aerospace applications.
- Demonstrate understanding of and be able to solve problems on operations and basic properties of the laser types like CO2 laser,diode laser etc.,
- Apply the quantum mechanical model to explain the behaviour of a system at microscopic level
- Explain the behaviour of bending beams and calculate the expression for young's modulus

TEXT BOOKS:

1. Dr.Mani P.A., “Text Book of Engineering Physics”, Ninth Edition, Dhanam Publications, Chennai,2011
2. Rajendran V., “Engineering Physics”, Tata Mc-Graw Hill Publishing Company limited, New Delhi, 2011
3. Gaur R.K. and Gupta.S.L., “Engineering Physics”, Dhanapat Rai Publications, New Delhi, 2011
4. Arumugam M., “Material Science”, Anuradha Technical Book Publisher, Kumbakonam,1997

REFERENCE BOOKS:

1. Serway and Jewett, “Physics for Scientists and Engineers with Modern Physics”, Sixth Edition, Thomson Brooks/Cole, Indian reprint, 2007
2. Rajendran V. and Marikani A., “Engineering Physics”, Third Edition, Tata Mc-Graw Hill Publications Ltd, New Delhi, 2004
3. Palanisamy P.K., “Engineering Physics”, Scitech publications, Chennai, 2007
4. Jayakumar S., “Engineering Physics”, R.K. Publishers, Tirunelveli, 2003
5. Pillai S.O., “Solid State Physics”, New Age Inc., 1998

01UCY204	ENVIRONMENTAL SCIENCE (Common to ALL Branches)	L	T	P	C
		3	0	0	3

COURSE OBJECTIVE:

- To understand the effect of technology on the environment and ecological balance and make the student sensitive to the environment problems in every professional endeavour that he/she participates

UNIT I ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY 10

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 9

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

UNIT III NATURAL RESOURCES 9

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, food adulteration, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies – Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. case studies – Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification – Role of an individual in conservation of natural resources – Equitable use of resources for sustainable lifestyles.

– Field study of local area to document environmental assets – river / forest / grassland / hill / mountain.

UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT 9

From unsustainable to sustainable development – Urban problems related to energy – Water conservation, rain water harvesting, watershed management – Resettlement and rehabilitation of people; its problems and concerns, case studies – role of non-governmental organization - Environmental ethics: Issues and possible solutions – Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies – Wasteland reclamation – Consumerism and waste products – Environment 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 – Public awareness.

UNIT V HUMAN POPULATION AND THE ENVIRONMENT 8

Population growth, variation among nations – Population explosion – Family welfare programme – Environment and human health – Human rights – Value education – HIV / AIDS – Women and child welfare – Role of information technology in environment and human health – Case studies.

Total: 45 Periods

LEARNING OUTCOMES:

After successful completion of this course the students will be able to:

- Express the concepts of ecosystem and biodiversity.
- Describe about the impact of environmental pollution.
- State the various types of energy resources.
- Explain the importance of environmental issues in the society.
- Analyze the impact of environmental issues related to human health.

TEXT BOOKS:

1. Gilbert M.Masters, “Introduction to Environmental Engineering and Science”, Third Edition, Pearson Education, Upper saddle River, New Jersey, 2004.
2. Benny Joseph, “Environmental Science and Engineering”, Tata Mc-Graw Hill, New Delhi, 2006.

REFERENCE BOOKS:

1. Miller T.G. Jr., “Environmental Science”, Wadsworth Publishing Company, Belmont, California, 1996.
2. Anubha Kaushik, Kaushik C.P., “Environmental Science and Engineering”, Third Edition, New Age International, New Delhi, 2009.
3. De A.K., “Environmental Chemistry”, Wiley Eastern Ltd., New Delhi, 2001.
4. Trivedi R.K., Goel P.K., “Introduction to Air Pollution”, Techno-Science Publications, Jaipur, 1995.

01UME205	BASIC CIVIL AND MECHANICAL ENGINEERING (Common to ALL Branches)	L	T	P	C
		4	0	0	4

COURSE OBJECTIVE:

- To understand the fundamentals of thermal systems
- To understand the basics of building construction and infrastructures

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.

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: 60 Periods

LEARNING OUTCOMES:

After successful completion of this course the students will be able to:

- Understand the fundamentals of thermal systems
- Basic knowledge on construction of infrastructures

TEXT BOOKS:

1. Seeni kannan P., Pitchayya Pillai G. and Arun Balasubramanian K., “Basic Civil and Mechanical Engineering”, Little Moon Publication, 2012.
2. Shanmugam G. and Palanichamy M.S., “Basic Civil and Mechanical Engineering”, Tata Mc-Graw Hill Publishing Co., New Delhi,1996.

REFERENCE BOOKS:

1. Ramamrutham S., “Basic Civil Engineering”, Dhanpat Rai, Publishing Co. (P) Ltd, 1999.
2. Seetharaman S., “Basic Civil Engineering”, Anuradha Agencies, 2005.
3. Venugopal K. and Prabhu Raja V., “Basic Mechanical Engineering”, Anuradha Publishers, Kumbakonam, 2000.
4. Shantha Kumar S.R.J., “Basic Mechanical Engineering”, Hi-Tech Publications, Mayiladuthurai, 2000.

01UCS207	DIGITAL PRINCIPLES AND SYSTEM DESIGN (Common to CSE & IT Branches)	L	T	P	C
		3	0	0	3

COURSE OBJECTIVE:

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

UNIT I BOOLEAN ALGEBRA AND LOGIC GATES 8

Review of binary number systems - Binary arithmetic – Binary codes – Boolean algebra and theorems - Boolean functions – Simplifications of Boolean functions using Karnaugh map and tabulation methods – Implementation of Boolean functions using logic gates

UNIT II COMBINATIONAL LOGIC 9

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

UNIT III DESIGN WITH MSI DEVICES 8

Decoders and encoders - Multiplexers and de multiplexers - Memory and programmable logic - HDL for combinational circuits

UNIT IV SYNCHRONOUS SEQUENTIAL LOGIC 10

Sequential circuits – Flip flops – Analysis and design procedures - State reduction and state assignment - Shift registers – Counters – HDL for Sequential Circuits

UNIT V ASYNCHRONOUS SEQUENTIAL LOGIC 10

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

Total: 45 Periods

LEARNING OUTCOMES:

After successful completion of this course the students will be able to:

- Apply arithmetic operations in any number system.
- Compare Boolean simplification techniques.
- Design a combinational circuit for arithmetic operations.
- Explain various types of memory and it's working.
- Analyze and design a given sequential digital circuit.

TEXT BOOKS:

1. Morris Mano M., "Digital Design", Third Edition, Pearson Education, 2007.
2. Donald P Leach, Albert Paul Malvino and Goutam Saha, "Digital Principles and Applications", Sixth Edition, Tata Mc-Graw-Hill, 2006.

REFERENCE BOOKS:

1. Charles H.Roth Jr., “Fundamentals of Logic Design” Fifth Edition, Jaico Publishing House, Mumbai, 2003
2. Donald D.Givone., “Digital Principles and Design”, Tata McGraw-Hill, 2007.
3. Thomas L.Floyd., “Digital Fundamentals”, Pearson Education Inc., New Delhi,2003.
4. Jain R.P., “Modern Digital Electronics”, Third Edition, Tata McGraw-Hill publishing company, New Delhi,2003

01UCS208	DIGITAL LABORATORY (Common to CSE & IT Branches)	L	T	P	C
		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 Periods

COURSE OUTCOMES:

After the successful completion of this course, the student will be able to

- Use Boolean simplification techniques to design a combinational hardware circuit.
- Test the Boolean theorems.
- Design combinational and sequential circuits.
- Analyze a given digital circuit – combinational and sequential.
- Design the different functional units in a digital computer system.

01UCS209	COMPUTER PRACTICE LABORATORY – II (Common to ALL Branches)	L	T	P	C
		0	0	3	2

LIST OF EXPERIMENTS

1. UNIX COMMANDS **15**

Study of Unix OS - Basic Shell Commands - Unix Editor .

2.SHELL PROGRAMMING **15**

Simple Shell program - Conditional Statements - Testing and Loops

3. C PROGRAMMING ON UNIX **15**

Dynamic Storage Allocation-Pointers-Functions-File Handling

Total: 45 Periods

COURSE OUTCOMES:

After the successful completion of this course, the student will be able to

- Use string handling functions in C programs.
- Write programs using pointers.
- Differentiate structures and unions.
- Employ Memory allocation techniques in programs.
- Apply the file concepts to handle the data.

01UGS210	PHYSICS & ENVIRONMENTAL SCIENCE LABORATORY (Common to ALL Branches)	L	T	P	C
		0	0	2	1

PHYSICS LABORATORY

List of Experiments

1. Determination of Band Gap of a semiconductor
2. Determination of viscosity of liquid – Poiseuille's method.
3. Spectrometer –To find the dispersive power of a prism
4. Determination of velocity of sound and compressibility of liquid –Ultrasonic interferometer.
5. To verify Newton's law of cooling of different liquid and to draw the cooling curve.
6. Determination of thermal conductivity of a bad conductor – Lee's Disc method.

- **A minimum of five experiments shall be offered**

ENVIRONMENTAL SCIENCE LABORATORY

List of Experiments

1. Determination of pH of water sample
2. Determination of electrical conductivity of water sample
3. Estimation of hardness of Water by EDTA method
4. Estimation of alkalinity of water sample
5. Estimation of Chloride in Water sample (Argentometric method)
6. Determination of DO in water (Winkler's method)
7. Determination of acidity of water sample

- **A minimum of five experiments shall be offered**

Total: 30 Periods

COURSE OUTCOMES:

After the successful completion of this course, the student will be able to

- Explain the concepts of Lasers and its applications.
- Calculate the dispersive power using spectrometer
- Determine the thermal conductivity of a bad conductor.
- Determine the quality of water, soil and industrial effluents
- Determination of acidity of industrial effluents

SEMESTER III

Course Code	Course Title	L	T	P	C
THEORY					
01UMA321	Transforms and Partial Differential Equations (Common to ALL Branches)	3	1	0	4
01UIT302	Programming with Data Structures	3	0	0	3
01UIT303	Computer Organization	3	0	0	3
01UIT304	Object Oriented Programming (Common to CSE & IT)	3	0	0	3
01UIT305	Database Systems	3	0	0	3
01UIT306	Analog and Digital Communication	3	0	0	3
PRACTICAL					
01UIT307	Programming with Data Structures Laboratory	0	0	3	2
01UIT308	Object Oriented Programming Laboratory (Common to CSE & IT)	0	0	3	2
01UIT309	Database Systems Laboratory	0	0	3	2
VALUE ADDED COURSE					
01UGS331	Value Education and Human Rights (Common to ALL Branches)	2	0	0	P/F
	TOTAL	20	1	9	25
Total No. of Credits - 25					

01UMA321	TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS (Common to ALL Branches)	L	T	P	C
		3	1	0	4

OBJECTIVES:

- To make the student knowledgeable in formulating certain practical problems in terms of partial differential equations, solve them and physically interpret the results.
- To familiarize the students to formulate and identify certain boundary value problems encountered in engineering practices, decide on applicability of the Fourier series method of solution, solve them numerically and interpret the results.
- To acquaint the student with the basics of Z - transform in its applicability to discretely varying functions, gained the skill to formulate certain problems in terms of difference equations and solve them using the Z - transform technique bringing out the elegance of the procedure involved.

UNIT I FOURIER SERIES **9 + 3**

Dirichlet‟s conditions – 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 - Application of Fourier series.

UNIT II FOURIER TRANSFORM **9 + 3**

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

UNIT III Z-TRANSFORM AND DIFFERENCE EQUATIONS **9 + 3**

Z-transform – Elementary properties – Inverse Z-transform – Convolution theorem – Initial and Final value Theorems - Formation of difference equations – Solution of difference equations.

UNIT IV APPLICATIONS OF PARTIAL DIFFERENTIAL EQUATIONS **9 + 3**

Introduction of Partial differential equations - Solutions of one dimensional wave equation – One dimensional equation of heat conduction – Steady state solution of two-dimensional equation of heat equation (Insulated edges excluded) – Fourier series solutions in Cartesian coordinates.

UNIT V NUMERICAL SOLUTIONS OF PARTIAL DIFFERENTIAL EQUATIONS **9 + 3**

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

TOTAL: 45 (L) + 15 (T) = 60 PERIODS

COURSE OUTCOMES:

After the successful completion of this course, the student will be able to

- Find the Fourier series of the given function in the given range
- Find Fourier transform for a given function
- Solve the difference equation using Z transform
- Solve the Partial differential equation using various methods
- Apply partial differential equation to solve wave and heat equation

TEXT BOOKS:

1. GREWAL B.S, “Higher Engineering Mathematics”, Khanna Publishers, New Delhi, 42nd Edition, (2012).
2. KANDASAMY.P, THILAGAVATHY.K, and GUNAVATHY.K, Engineering Mathematics III, S.Chand & Company Ltd., New Delhi, 3rd Edition, (1996).

REFERENCE BOOKS:

1. BALI N.P., MANISH GOYAL and WATAINS, “Advanced Engineering Mathematics”, Firewall Media (An imprint of Laxmi Publication Private limited) New Delhi, 7th Edition, (2009).
2. RAMANA.B.V, “Higher Engineering Mathematics” Tata McGraw Hill, New Delhi, 11th Reprint (2010).
3. GLYN JAMES, “Advanced Modern Engineering Mathematics”, Pearson Education, New Delhi, 3rd Edition, (2007).
4. ERWIN KREYSZIG, “Advanced Engineering Mathematics”, Wiley India, 10th Edition, (2011).
5. GERALD C.F. and WHEATELEY, P.O. “Applied Numerical Analysis”, Pearson Education, New Delhi, 6th Edition, (2006).

01UIT302	PROGRAMMING WITH DATA STRUCTURES	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To familiarize the design and applications of linear, tree, balanced tree, hashing, set and graph structures
- To demonstrate the systematic way of solving problems
- To explain implementation techniques using different data structures

UNIT I LINEAR STRUCTURES 10

Abstract Data Types (ADT) – List ADT – Array-based implementation – Linked list implementation – Doubly-linked lists – Applications of lists –Stack ADT – Queue ADT – Circular queue implementation – Applications of stacks and queues.

UNIT II TREE STRUCTURES 8

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 –Threaded Binary Trees.

UNIT III BALANCED TREE 9

AVL Trees – Splay Trees – B-Tree - heaps – Binary heaps – Applications of binary heaps.

UNIT IV HASHING AND SET 9

Hashing – Separate chaining – open addressing – rehashing – extendible hashing -Disjoint Set ADT – dynamic equivalence problem – smart union algorithms – path compression – Applications of Set.

UNIT V GRAPHS 9

Definitions – Topological sort – breadth-first traversal - shortest-path algorithms – minimum spanning tree – Prim's and Kruskal's algorithms – Depth-first traversal – bi connectivity – Euler circuits – Applications of graphs.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of this course, the student will be able to

- Apply the knowledge in types of data structures to solve the related problems in relevant applications.
- Apply the knowledge of tree data structures to find solutions to complex problems related to data search, storage and retrieval.
- Identify the issues in balanced trees and analyze them to solve the relevant problems.
- Analyze hashing and set techniques for achieving reliable data search and retrieval.
- Apply the concept of graph data structures to solve suitable applications.

TEXT BOOKS:

1. Weiss.M.A, “Data Structures and Algorithm Analysis in C”, Pearson Education, Second Edition, 2005.
2. Aaron M. Tenenbaum, YedidyahLangsam, Moshe J.Augenstein, “Data Structures using C”, Pearson Education India, 7th Edition , New Delhi , 2009.

REFERENCE BOOKS:

1. Aho.V, Hopcroft.J.E, Ullman.J.D, “Data Structures and Algorithms”, Pearson Education, First Edition Reprint, 2003.
2. Gilberg.R.F, Forouzan.B.A, “Data Structures”, Thomson India, Pearson Education,Second Edition, 2000.
3. Sara Baase and A.VanGelder, “Computer Algorithms”, Pearson Education, Third Edition, 2005.
4. Cormen T.H, C.A.Leiserson.B.A, R.L. Rivest, and C.Stein, Introduction to algorithms”, Prentice hall of India, Second Edition, 2001.

01UIT303	COMPUTER ORGANIZATION	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To introduce the basic structure and operation of a digital computer
- To demonstrate the operation of the arithmetic unit including the algorithms & implementation of fixed-point and floating-point addition, subtraction, multiplication & division
- To familiarize the concepts of pipe lining, memory systems, I/O devices and standard I/O interfaces

UNIT I BASIC STRUCTURE OF COMPUTERS 9

Functional units – Basic operational concepts – Bus structures – Performance and Metrics – Memory Locations & addresses, Memory Operations – Instructions and instruction sequencing – Hardware – Software Interface – Instruction set architecture – Addressing modes – RISC – CISC. ALU design.

UNIT II COMPUTER ARITHMETIC 9

Addition and subtraction of signed numbers - Design of fast adders - Multiplication of positive numbers - Signed operand multiplication and fast multiplication - Integer division - Floating point numbers and operations - Nano programming.

UNIT III BASIC PROCESSING UNIT AND PIPELINING 9

Basic Processing Unit-Fundamental concepts – Execution of a complete instruction – Multiple bus organization– Hardwired control – Micro programmed control -Pipelining - Basic concepts – Data hazards – Instruction hazards – Influence on instruction sets – Data path and control considerations – Performance considerations.

UNIT IV MEMORY SYSTEM 9

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

UNIT V I/O ORGANIZATION 9

Accessing I/O devices – Programmed Input / Output -Interrupts – Direct Memory Access – Buses – Interface circuits – Standard I/O Interfaces (PCI, SCSI, USB), I/O devices and Processors - CPU Processor Comparison – Intel Core i7 vs. i5 vs. i3.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of this course, the student will be able to

- Understand the basic components of a computer, including CPU, memories, and input/output, and their organization
- Explain the arithmetic operations of binary number system.
- Design a pipeline for consistent execution of instructions with minimum
- Adapt a wide variety of memory technologies both internal and external.
- Apply various I/O operations.

TEXT BOOKS:

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

REFERENCE BOOKS:

1. David A. Patterson, John L. Hennessy, “Computer Organization and Design The Hardware/Software interface”, Elsevier, Third Edition, 2005.
2. William Stallings, “Computer Organization and Architecture Designing for Performance”, Pearson Education, Sixth Edition, 2003.
3. Heuring.V.P, Jordan.H.F, “Computer Systems Design and Architecture”, Pearson Education, Second Edition, 2004.
4. Morris Mano.M, “Computer System Architecture”, Prentice Hall, Third edition, 1992.

01UIT304	OBJECT ORIENTED PROGRAMMING (Common to CSE & IT)	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To explain the basic concepts of OOPs, benefits of OOPs and applications of OOPs
- To summarize various ways of handling exceptions, files and various OOPs features
- To demonstrate OOPs concepts with data structures

UNIT I INTRODUCTION **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 – recursive and inline functions – friend functions – const and volatile functions - static members – Objects – pointers and objects – constant objects – nested classes – local classes.

UNIT II CONSTRUCTORS AND DESTRUCTORS **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 EXCEPTIONS **9**

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

UNIT IV INHERITANCE AND POLYMORPHISM **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 INPUT/OUTPUT WITH FILES **9**

Streams and formatted I/O – I/O manipulators - file handling – random access – object serialization – namespaces - std namespace – ANSI String Objects – standard template library - Applications of OOP to data structures

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of this course, the student will be able to

- Summarize basic oops concepts for an appropriate application
- Develop programs using constructors and destructors
- Identify exception handling mechanisms
- Describe Templates for time conventional programming
- Construct object oriented Programs using files

TEXT BOOKS:

1. Trivedi.B, “Programming with ANSI C++”, Oxford University Press, 2007.
2. Robert Lafore, Object Oriented Programming in C++ Pearson, 4th Edition,2002.

REFERENCE BOOKS:

1. Joshva Devadas.T, A.Chandrababu. “A Programming with C++”, Narosa Publishing HouseFirst Edition, 2009.
2. Ira Poh “Object Oriented Programming using C++”, Pearson Education, Second Edition, Reprint, 2004.
3. Lippman.S.B, JoseeLajoie, Barbara E. MooC++ Primer”, Pearson Education,,fourth Edition, 2005.
4. Stroustrup.B, The C++ Programming language”, Pearson Education, Third Edition, 2004.

01UIT305	DATABASE SYSTEMS	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To introduce the basic concepts of database system design and architecture
- To familiarize the Normal forms
- To demonstrate the transaction, recovery controls and storage techniques

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. Multimedia Database. Case study: FIRM –a database management system for real time avionics.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of this course, the student will be able to

- Apply the knowledge of data base systems to construct an E-R model for any applications.
- Design a DBMS for an application using Relational Models.
- Select and apply appropriate techniques to develop a normalized database.
- Analyze the various storage techniques to improve the query processing.
- Identify the issues in emerging database technologies

TEXT BOOKS:

1. Abraham Silberschatz, Henry F. Korth, Sudharshan.S, “Database System Concepts”, Tata McGraw Hill, 5th Edition, 2006.
2. Date.C.J, Kannan.A, Swamynathan.S, “An Introduction to Database Systems”, Pearson Education, 8th Edition, 2006.

REFERENCE BOOKS:

1. RamezElmasri, ShamkantB.Navathe, “Fundamentals of Database Systems”, Pearson Addision Wesley, 4th Edition, 2007.
2. Raghu Ramakrishnan, “Database Management Systems”, Tata McGraw Hill, 3rd Edition.
3. Singh.S.K, “Database Systems Concepts, Design and Applications”, Pearson Education, 1st Edition, 2006.
4. Hector Garcia-Molina, Jeffrey D.Ullman, Jennifer Widom, “Database Systems: The Complete Book”, Pearson Education, 4th Edition, 2009.

01UIT306	ANALOG AND DIGITAL COMMUNICATION	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To familiarize the concepts, circuit analysis and techniques from basic communications systems to digital communications
- To explain the strengths and weaknesses of various communication systems
- To summarize the modeling and simulation characteristics of communication networks

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 MODELLING OF COMMUNICATION SYSTEM AND CHANNEL MODELS 9

Model of speech and picture signals, Pseudo noise sequences, Non-linear sequences, Analog channel model, Noise and fading, Digital channel model-Gilbert model of bustry channels, HF, Troposcatter and satellite channels, Switched telephone channels, Analog and Digital communication system models, Light wave system models.

UNIT IV DIGITAL TRANSMISSION 9

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

UNIT V SPREAD SPECTRUM AND MULTIPLE ACCESS TECHNIQUES 9

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

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Apply Analog and digital communication techniques in estimating channel characteristics
- Design simple analog communication systems
- Analyze the characteristics of communication channels
- Simulate the random variables
- Estimate the communications channels

TEXT BOOKS:

1. Wayne Tomasi, “Advanced Electronic Communication Systems”, Pearson Education, 2007.
2. Simon Haykin, “Communication Systems”, John Wiley & Sons, 4th Edition, 2001.
3. A.M.Law, W.DavidKelton, “Simulation Modeling and analysis”, McGraw Hill Inc., New York, 1991.

REFERENCE BOOKS:

1. M.C. Jeruchim, Philip Balaban, K. Sam Shanmugam, “Simulation of Communication Systems”, Plenum Press, New York, 1992.
2. H.Taub, D L Schilling, G Saha, “Principles of Communication”, 3rd,2007.
3. B.P.Lathi, “Modern Analog and Digital Communication systems”, Oxford University Press,2007.

01UIT307	PROGRAMMING WITH DATA STRUCTURES LABORATORY	L	T	P	C
		0	0	3	2

OBJECTIVES:

- To demonstrate the systematic way of solving problems using various data structures

LIST OF EXPERIMENTS

1. Implement singly linked lists.
2. Implement doubly linked lists.
3. Represent a polynomial as a linked list and write functions for polynomial addition.
4. Implement stack and use it to convert infix to postfix expression.
5. Implement a double-ended queue (dequeue) where insertion and deletion operations are possible at both the ends.
6. Implement an expression tree. Produce its pre-order, in-order, and post-order traversals.
7. Implement binary search tree.
8. Implement insertion in AVL trees.
9. Implement deletion in AVL trees.
10. Implement priority queue using binary heaps.
11. Implement hashing with open addressing.
12. Implement Prim's algorithm using priority queues to find MST of an undirected graph.

TOTAL: 45 PERIODS

COURSE OUTCOMES

After the successful completion of this course, the student will be able to

- Develop programs using dynamic memory allocation and linked list ADT
- Develop programs for implementing various tree structures
- Make use of tree ADT
- Solve the issues in arranging the data with hashing
- Solve real world problems by finding minimum spanning tree and Shortest path algorithm

HARDWARE AND SOFTWARE REQUIRMENTS

Computer Required: 30 No's

Minimum Requirement: Processor: Pentium IV, Ram: 1 GB, Hard Disk: 80 GB

Software Requirements:

Operating System: Linux (Ubuntu/Fedora/ Debian /Mint OS) / Windows

TURBO C VERSION 3 Or GCC Version Unit III UNIT III4/ Built in linux /DEVC++

01UIT308	OBJECT ORIENTED PROGRAMING LABORATORY (Common to CSE & IT)	L	T	P	C
		0	0	3	2

OBJECTIVES:

- To demonstrate the various features of Object Oriented Programming

LIST OF EXPERIMENTS

1. Write a C++ program using classes with primitive data members and objects.
2. Write a simple C++ program to create a class default arguments and necessary objects.
3. Write a C++ program to illustrate call by value, call by address, call by reference.
4. Write a C++ program to demonstrate the use of friend function.
5. Write a C++ program to implement virtual and inline functions.
6. Write a C++ program to create classes with constructor, destructor, copy constructor.
7. Write a C++ program to perform assignment operator overloading.
8. Write a C++ program to illustrate dynamic polymorphism.
9. Write a C++ program to create classes with hierarchical inheritance concepts.
10. Write a C++ program to perform sorting operation using templates.
11. Write a C++ program to implement a queue using exception handling.
12. Write a C++ program to perform operations on complex numbers using files as storage

TOTAL: 45 PERIODS

COURSE OUTCOMES

After the successful completion of this course, the student will be able to

- Make use of object oriented programming concepts
- Construct programs using the applications of object oriented programming.
- Apply inheritance and polymorphism concepts.
- Develop code for overloading operators
- Analyze access issues using files

HARDWARE AND SOFTWARE REQUIRMENTS

Computer Required: 30 No‟s

Minimum Requirement: Processor: Pentium IV, Ram: 1 GB, Hard Disk: 80 GB

Software Requirements:

Operating System: Linux (Ubuntu / Fedora / Debian / MintOS) / Windows

Turbo C Version 3 or GCC Version Unit III UNIT III4 / Built in Linux / DEVC++

01UIT309	DATABASE SYSTEMS LABORATORY	L	T	P	C
		0	0	3	2

OBJECTIVES:

- To demonstrate the database design concepts for various real time applications

LIST OF EXPERIMENTS

1. Implement Data Definition Language (DDL) commands in RDBMS.
2. Implement Data Manipulation Language (DML) and Data Control Language (DCL) commands in RDBMS.
3. Implement High-Level Language extension with Cursors.
4. Implement High Level Language extension with Triggers
5. Implement Procedures and Functions.
6. Implement embedded SQL.
7. Implement database design using E-R model and Normalization.
8. Design and implementation of Payroll Processing System.
9. Design and implementation of Banking System.
10. Design and implementation of Library Information System.
11. Design and implementation of Air Ticket Reservation System.
12. Design and Implementation of Online Test.

TOTAL: 45 PERIODS

COURSE OUTCOMES

After the successful completion of this course, the student will be able to

- Apply the knowledge of DDL and DML in database design to solve the complex problems
- Apply the knowledge of integrity constraints on a databases
- Design a solution for PL/SQL queries using functions, cursors and Triggers
- Analyze the redundancy in database
- Function effectively as an individual and as a member for IT based products.

HARDWARE AND SOFTWARE REQUIRMENTS

Computer Required: 30 No"s

Minimum Requirement: Processor: Pentium IV, Ram: 1 GB, Hard Disk: 80 GB

Software Requirements: Operating System: Linux (Ubuntu / Fedora / Debian / Mint OS)/Windows

Front End: VB/VC++/Java or Equivalent

Back End: Oracle / SQL / MySQL / PostGress / DB2 or Equivalent

01UGS331	VALUE EDUCATION AND HUMAN RIGHTS (Common to ALL Branches)	L	T	P	C
		2	0	0	P/F

OBJECTIVES:

- To inculcate the values of humanism, spirituality and to have an awareness of human rights
- To acquire knowledge and develop a sensitivity to the diversity of Indian culture

UNIT I VALUES AND SELF DEVELOPMENT 6

Concept of value- Social values and individual attitudes, Work ethics, Indian vision of humanism, Moral and non moral valuation, Standards and principles - - Need for inculcation of values in today"s society- Sense of duty, Devotion, Self reliance, Confidence, Concentration, Truthfulness, Cleanliness, Honesty, Humanity, Power of faith, National unity, Patriotism, Love for nature, Discipline.

UNIT II PERSONALITY AND BEHAVIOR DEVELOPMENT 6

Soul and scientific attitude, God and scientific attitude, Positive thinking, Integrity and discipline, Punctuality, Love and kindness, Avoiding fault finding, Free from anger, Dignity of labor, Universal brotherhood and religious tolerance, True friendship, Happiness vs. suffering love for truth, Aware of self destructive habits, Association and cooperation, Doing best, Saving nature**.**

UNIT III CHARACTER AND COMPETENCE 6

Science vs. God, Holy books vs. blind faith, Self management and good health, Science of reincarnation, Equality, Nonviolence, Humility, Role of women, All religions and same message, Mind your mind, Self control, Honesty, Studying effectively.

UNIT IV STRATEGIES FOR VALUE INCULCATION AND EVALUATION 6

Co-curricular Activities- Story – Telling- Discussion / Symposium- Drama- Role – play- Slogans and Quotations - Slides, filmstrips, films- Games- Songs -The need for value evaluation-Tool and Techniques of value evaluation- Written tests technique Multiple choice, True and False, Fill in the blanks, Matching, Short answer-Tally of events Technique- Quiz technique- Photo language session-Checklist Technique- Art Computation Technique**.**

UNIT V HUMAN RIGHTS 6

Jurisprudence of human rights nature and definition, Universal protection of human rights, Regional protection of human rights, National level protection of human rights, Human rights and vulnerable groups

TOTAL: 30 PERIODS

COURSE OUTCOMES:

After the successful completion of this course, the student will be able to:

- Explain the social and personal values of life
- Describe the importance of human rights
- Analyze key issues related to values of life and human rights and propose appropriate solutions to the situations

TEXT BOOKS:

1. Chakraborty, S.K., Values and Ethics for Organizations Theory and Practice", Oxford University Press, New Delhi, 2001.
2. Kapoor, S.K., Human rights under International Law and Indian Law, Prentice Hall of India, New Delhi, 2002.

REFERENCE BOOKS:

1. Frankena, , W.K., "Ethics ", Prentice Hall of India,, New Delhi, 1990.
2. Meron Theodor, "Human Rights and International Law Legal Policy Issues", Oxford University Press, First Edition, New Delhi, 2000.

SEMESTER IV

Course Code	Course Title	L	T	P	C
THEORY					
01UMA421	Applied Statistics and Queuing Networks (Common to CSE & IT)	3	1	0	4
01UIT402	Analysis and Design of Algorithms	3	1	0	4
01UCS403	Java Programming (Common to CSE & IT)	3	0	0	3
01UIT404	Principles of Operating Systems	3	0	0	3
01UIT405	Object Oriented Software Engineering Methodologies	3	0	0	3
01UEC423	Microprocessors and Microcontrollers (Common to CSE & IT)	3	0	0	3
01UGS431	Qualitative and Quantitative Aptitude (Common to ALL Branches)	1	0	0	1
PRACTICAL					
01UCS407	Java Programming Laboratory (Common to CSE & IT)	0	0	3	2
01UIT408	Operating Systems Practice Laboratory	0	0	3	2
01UEC427	Microcontrollers and Microprocessors Laboratory (Common to CSE & IT)	0	0	3	2
	TOTAL	19	2	9	27
Total No. of Credits - 27					

01UMA421	APPLIED STATISTICS AND QUEUEING NETWORKS (Common to CSE & IT)	L	T	P	C
		3	1	0	4

OBJECTIVES:

- To make the student acquire sound knowledge of standard distributions that can describe real life phenomena.
- To acquire skills in handling situations involving more than one random variable and functions of random variables.
- To provide the basic characteristic features of a queuing system and develop the skills in analyzing queuing models.

UNIT I PROBABILITY & STATISTICAL DISTRIBUTIONS 9 + 3

Axioms of probability - Conditional probability - Total probability - Baye‟s theorem – Discrete and continuous random variables - Moments - Moment generating functions and their properties. Binomial, Poisson, Normal, Geometric, Uniform, Exponential and Gamma distributions.

UNIT II TWO DIMENSIONAL RANDOM VARIABLES 9 + 3

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

UNIT III DESIGN OF EXPERIMENTS 9 + 3

Completely Randomized Design – Randomized Block Design – Latin Square Design.

UNIT IV QUEUING THEORY 9 + 3

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

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

M/G/1 Queue - Pollaczek- Khintchine formula. Series Queues - Open and Closed networks.

TOTAL: 45 (L) + 15 (T) = 60 PERIODS

COURSE OUTCOMES:

After the successful completion of this course, the student will be able to

- Acquire knowledge of standard distributions and able to apply in real life phenomena.
- Find the relationship involving more than one random variables and able to analyze the problems.
- Design and analyze a process, to evaluate which process inputs have a significant impact on the process output using design of experiments.
- Study the basic characteristic features of a queuing system and acquire skills in analyzing queuing models.

TEXT BOOKS:

1. OLIVER C. IBE, “Fundamentals of Applied probability and Random processes”, Elsevier, Lowell, Massachusetts, first Indian Reprint (2007).
2. GROSS D, and HARRIS C.M., “Fundamentals of Queuing Theory”, Wiley Students, India, 3rd Edition, (2004).

REFERENCE BOOKS:

1. ALLEN.A.O, “Probability, Statistics and Queuing Theory with Computer Applications”, Elsevier, New Delhi, 2nd Edition, (2005).
2. TAHA.H. A., “Operations Research-An Introduction”, Pearson Education, New Delhi, 9th Edition, (2010).
3. TRIVEDI.K. S., “Probability & Statistics with Reliability, Queuing & Computer Science Applications”, Prentice Hall of India, New Delhi, 2nd Edition, (2009).
4. JOHNSON R.A, and GUPTA C.B., “Miller and Freund‟s Probability and Statistics for Engineers”, Pearson Education, New Delhi, 8th Edition, (2011).
5. VEERARAJAN T. “Probability, Statistics and Random Process”, Tata McGraw Hill, New Delhi, 2nd Edition, (2003).

01UIT402	ANALYSIS AND DESIGN OF ALGORITHMS	L	T	P	C
		3	1	0	4

OBJECTIVES:

- To introduce basic concepts of algorithms and classify various algorithmic techniques
- To review mathematical aspects and analysis of algorithms
- To summarize sorting , searching algorithms and report algorithm design methods

UNIT I BASIC CONCEPTS OF ALGORITHMS 9 + 3

Introduction - Notion of Algorithm - Fundamentals of Algorithmic Solving - Important Problem types - Fundamentals of the Analysis Framework - Asymptotic Notations and Basic Efficiency Classes.

UNIT II MATHEMATICAL ASPECTS AND ANALYSIS OF ALGORITHMS 9 + 3

Mathematical Analysis of Non-recursive Algorithm - Mathematical Analysis of Recursive Algorithm - Example: Fibonacci Numbers - Empirical Analysis of Algorithms - Algorithm Visualization.

UNIT III ANALYSIS OF SORTING AND SEARCHING ALGORITHMS 9 + 3

Brute Force - Selection Sort and Bubble Sort - Sequential Search and Brute-force string matching - Divide and conquer - Merge sort - Quick Sort - Binary Search - Binary tree- Traversal and Related Properties - Decrease and Conquer - Insertion Sort - Depth first Search and Breadth First Search.

UNIT IV ALGORITHMIC TECHNIQUES 9 + 3

Transform and conquer - Presorting - Balanced Search trees - AVL Trees - Heaps and Heap sort - Dynamic Programming - Warshall's and Floyd's Algorithm - Optimal Binary Search trees - Greedy Techniques - Prim's Algorithm - Kruskal's Algorithm - Dijkstra's Algorithm - Huffman trees.

UNIT V ALGORITHM DESIGN METHODS 9 + 3

Backtracking - n-Queen's Problem - Hamiltonian Circuit problem - Subset-Sum problem - Branch and bound - Assignment problem - Knapsack problem - Traveling salesman problem.

TOTAL: 45 (L) + 15 (T) = 60 PERIODS

COURSE OUTCOMES:

After the successful completion of this course, the student will be able to

- Explain the computational complexity of algorithms
- Apply the mathematical aspects to solve complex algorithms
- Analyze various searching and sorting techniques
- Apply algorithmic techniques in any simple real time applications
- Analyses various Algorithmic design methods

TEXT BOOKS:

- AnanyLevitin, “Introduction to the Design and Analysis of Algorithm”, Pearson Education Asia, Third Edition, 2011.
- Ellis Horowitz, SartajSahni, Sanguthevar Rajasekaran,” Computer Algorithms/C++”, Universities Press, Second Edition, 2007.

REFERENCE BOOKS:

1. Cormen.T.H, Leiserson.C.E, Rivest.R.L, Stein.C, “Introduction to Algorithms”, PHI Pvt. Ltd., Third Edition, 2009.
2. Sara Baase, Allen Van Gelder, “Computer Algorithms - Introduction to Design and Analysis”, Pearson Education Asia, 2003.
3. Aho.A.V, Hopcroft.J.E, Ullman.J.D,” The Design and Analysis of Computer Algorithms”, Pearson Education Asia, Third Edition, 2008.
4. Lee.R.C.T, Tseng.S.S, Chang.R.C,Tsai Y.T ” Introduction to the Design and Analysis of Algorithms A Strategic Approach ”, McGraw-Hill Education,2005.

01UCS403	JAVA PROGRAMMING (Common to CSE & IT)	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To explain the concepts of object-oriented programming paradigms.
- To impart knowledge in I/O packages of Java.
- To summarize the basic concepts of GUI programming.
- To review concurrent programming paradigms.

UNIT I JAVA FUNDAMENTALS 9

Features of Java- OOP Concepts- Java Virtual Machine- Reflection Byte Codes - Byte Code Interpretation - Objects and Classes - Access Specifiers – Static Members – Constructors - Arrays – Strings.

UNIT II INHERITANCE AND JAVA CLASSES 9

Inheritance – Class Hierarchy – Polymorphism - Abstract Classes - Static Classes - Inner Classes - Object Classes – Reflection - Packages – Interfaces.

UNIT III MULTI THREADING AND EXCEPTION HANDLING 9

Multi-Threaded Programming - Thread Life Cycle - Thread Properties - Thread Synchronization – Exceptions: Exception Hierarchy – Try, Catch, Finally - Throw, Throws – Multiple Catch Statements- Throwing Our Own Exceptions – Using Exceptions for Debugging.

UNIT IV GUI 9

Introduction to AWT Programming - Layout Management – Buttons - Graphics Programming: Frame – Components – Working With 2D Shapes – Using Color, Fonts, And Images - Basics of Event Handling – Event Handlers – Mouse Events.

UNIT V IO PACKAGES AND DATABASE CONNECTIVITY 9

Input Streams - Output Streams - Object Serialization - Deserialization - Filter and Pipe Streams - JDBC Architecture - Establishing Connectivity and Working With Connection Interface.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of this course, the student will be able to

- Describe object oriented programs in Java
- Compare various inheritance mechanisms in java
- Explain multithreaded programming and exception handling in java
- Design GUI based applications using Java 2D and Swing components
- Discuss the connectivity with database using JDBC and work with I/O streams

TEXT BOOKS:

1. Cay Horstmann, and Gary Cornell, “Core Java Volume - I Fundamentals”, Prentice Hall, 9th Edition, 2011.
2. Herbert Schildt, “The Complete Reference JAVA 2”, Tata McGraw Hill, 5th Edition, 2002.

REFERENCE BOOKS:

1. Suresh Kumar .T.V, Eswara Reddy .B, and Raghavan .P, “Programming with Java ”, Pearson Education, 2011.
2. Paul J. Deitel, and Harvey M. Deitel, “Java for Programmers”, Pearson Education, 2nd Edition, 2012.
3. E.Balagurusamy, „Programming with JAVA – A Primer‟, Tata McGraw Hill ,Second edition, , 2003.
4. Kris Jasma, „Java Programming–A Complete Reference‟, Galgotia publication, 1994

01UIT404	PRINCIPLES OF OPERATING SYSTEMS	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To explain the tasks of Operating System such as Process management, Memory Management and I/O management
- To familiarize CPU and disk scheduling algorithms
- To introduce the concept of file system

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 – Inter process 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- Distributed file systems. Case studies: File system in Linux.

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 – disk attachment – stable storage – tertiary storage. Case study: I/O in Linux.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of this course, the student will be able to

- Classify the different types of operating system
- Apply the suitable algorithms for various problems related to process management
- Illustrate deadlock and memory management problems
- Analyze virtual memory and file sharing concepts
- Make use of file management concepts

TEXT BOOKS:

1. Silberschatz, Galvin, Gagne, “Operating System Concepts”, Wiley India Pvt Ltd, Sixth Edition, 2003.
2. MukeshSinghal, Shivaratri.N.G, “Advanced concepts in operating systems”, McGrawHill, 2000.

REFERENCE BOOKS:

1. Andrew S, Tanenbaum, “Modern Operating Systems”, Pearson Education PHI, Second Edition, 2001.
2. Gary Nutt, “Operating Systems”, Pearson Education, Third Edition, 2004.
3. Harvey M. Deital, “Operating Systems”, Pearson Education, Third Edition, 2004.
4. William Stallings, “Operating Systems – Internals and Design Principles”, Pearson Prentice Hall, Sixth Edition, 2009.

01UIT405	OBJECT ORIENTED SOFTWARE ENGINEERING METHODOLOGIES	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To introduce the fundamental concepts of requirements engineering and Analysis modelling
- To explain the phases of a software project life Cycle, testing and maintenance measures
- To review the major considerations for enterprise integration and deployment

UNIT I SOFTWARE PROCESS AND PROJECT MANAGEMENT 9

Introduction to Software Engineering, Software Process, Perspective and Specialized Process Models – Software Project Management: Estimation – LOC and FP Based Estimation, COCOMO, Agile Models - Project Scheduling – Scheduling, Earned Value Analysis - Risk Management.

UNIT II REQUIREMENTS ANALYSIS AND SPECIFICATION 9

Software Requirements: Functional and Non-Functional, User requirements, System requirements, Software Requirements Document – Requirement Engineering Process: Feasibility Studies, Requirements elicitation and analysis, requirements validation, requirements management-Classical analysis: Structured system Analysis, Petri Nets- Data Dictionary.

UNIT III SOFTWARE DESIGN 9

Design process – Design Concepts-Design Model– Design Heuristic – Architectural Design – Architectural styles, Architectural Design, Architectural Mapping using Data Flow- User Interface Design: Interface analysis, Interface Design –Introduction to real time software design - Component level Design: Designing Class based components, traditional Components.

UNIT IV TESTING AND IMPLEMENTATION 9

Software testing fundamentals-Internal and external views of Testing-white box testing - basis path testing-control structure testing-black box testing- Regression Testing – Unit Testing – Integration Testing – Validation Testing – System Testing And Debugging – Software Implementation Techniques: Coding practices-Refactoring – Software Configuration Management.

UNIT V PROJECT MANAGEMENT 9

Estimation – FP Based, LOC Based, Make/Buy Decision, COCOMO II - Planning – Project Plan, Planning Process, RFP Risk Management – Identification, Projection, RMMM - Scheduling and Tracking –Relationship between people and effort, Task Set & Network, Scheduling, EVA - Process and Project Metrics.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

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

- Demonstrate the current models, and techniques for the software lifecycle
- Identify the requirements needed for the solution to a software problem
- Apply appropriate software design and architecture for an application.
- Identify suitable testing techniques for software projects.
- Choose suitable project planning and risk management for software projects

TEXT BOOKS:

1. Roger Pressman. S," Software Engineering – A Practitioner‟s Approach", McGraw-Hill International Edition, Seventh Edition, 2010.
2. Ian Sommerville," Software Engineering", Pearson Education Asia, 9th Edition, 2011.

REFERENCE BOOKS:

1. Rajib Mall, "Fundamentals of Software Engineering", PHI Learning Private Limited, Third Edition, 2009.
2. PankajJalote, "Software Engineering, A Precise Approach", Wiley India, 2010.
3. Kelkar S.A, "Software Engineering", Prentice Hall of India Pvt Ltd, 2007.
4. Stephen R.Schach,"Software Engineering", Tata McGraw-Hill Publishing Company Limited, 2007.

01UEC423	MICROPROCESSORS AND MICROCONTROLLERS (Common to CSE & IT)	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To introduce the different types of microprocessor architecture
- To present the multiprocessor configuration and architecture
- To provide the knowledge about microcontroller and the concepts of interfacing

4

UNIT I THE 8085 AND 8086 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 – Data Types – Architecture –8089 I/O Processor –Architecture – Communication between CPU and IOP.

UNIT IV I/O INTERFACING 9

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

UNIT V MICROCONTROLLERS 9

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

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After successful completion of this course, the Students will be able to:

- Compare the 8085 and 8086 architecture and its programming
- Explain I/O interfacing
- Differentiate between closely coupled configuration and loosely coupled configuration
- Explain the 8087,8089 architecture and its application
- Describe the architecture of microcontroller and its interfacing concept for real time applications

TEXT BOOKS:

1. Ramesh S. Gaonkar, “Microprocessor – Architecture, Programming and Applications with the 8085” , Penram International Publisher , 5th Edition, 2006.
2. Yn-cheng Liu,Glenn A.Gibson, “Microcomputer systems: The 8086 / 8088 Family architecture, Programming and Design” , Prentice Hall of India,2nd Edition 2006.

REFERENCE BOOKS:

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

01UGS431	QUALITATIVE AND QUANTITATIVE APTITUDE (Common to ALL Branches)	L	T	P	C
		1	0	0	1

OBJECTIVES:

- To make the student acquire sound knowledge of the characteristic of quantitative and qualitative aptitude.
- To familiarize the student with various principles involved in solving mathematical problems.
- To develop an understanding of the basic concepts of reasoning skills.

UNIT I QUANTITATIVE APTITUDE **8**

Numbers – HCF and LCM - Arithmetic and Geometric Progression – Averages –Percentages – Problems on ages – Profit and Loss – Simple and Compound Interest - Ratio and Proportion – Time – Speed – Distance – Work – Pipes and Cistern – Problems on Trains – Alligation or Mixture– Permutation and Combination – Clocks – Calendars.

UNIT II NON VERBAL AND LOGICAL REASONING **7**

Analytical Reasoning – Critical reasoning – Circular and Linear arrangement – Direction problems – Blood relations – Analogy – Odd Man Out – Attention to detail - Logical Reasoning – Venn Diagrams – Deductive and Inductive reasoning – Statement and Conclusion, Statement and Implications – Brain Teasers – Letter series & arrangement – Alpha Numeric Series – Syllogism - Coding – Decoding.

TOTAL: 15 PERIODS

COURSE OUTCOMES:

After the successful completion of this course, the student will be able to

- Solve the problems on commercial mathematics and correlation
- Interpret the graphical and numerical data

WEBSITES:

www.tcyonline.com, www.m4maths.com, www.indiabix.com , www.fresherworld.com, www.careerbless.com

TEXT BOOKS:

1. Dr. R.S.Agarwal, “Quantitative Aptitude”, S. Chand Publications, New Delhi, 17th Edition, (2010).
2. Trishna Knowledge Systems, “Quantitative Aptitude”, Pearson Education, South Asia, 2nd Edition, (2009).

REFERENCE BOOKS:

1. Abijit Guha, “Quantitative Aptitude for Competitive Examinations”, Tata McGraw Hill Publication, New Delhi, 4th Edition, (2011).
2. Dr. V.A.Sathgurunath"s “A Guide for Campus Recruitment”, Sagarikka Publications, Thiruchirapalli, 3rd Edition, (2011).
3. NISHIT K.Sinha “Quantitative Aptitude for CAT”, Pearson Publication, New Delhi, 2nd Edition, (2009).
4. Dr. N.K.Singh, “Quantitative Aptitude Test”, Upkars Prakashan Publications, Agra, Revised Edition, (2013).

01UCS407	JAVA PROGRAMMING LABORATORY (Common to CSE & IT)	L	T	P	C
		0	0	3	2

OBJECTIVES:

- To demonstrate various features of JAVA

LIST OF EXPERIMENTS

1. Simple Java Programs.
2. Programs Using Arrays and Strings.
3. Programs to Demonstrate Static Data Members and Member Functions.
4. Programs on Interfaces.
5. Programs on Packages.
6. Programs Using Function Overloading.
7. Programs Using Inheritance, Function Overriding, and Constructors.
8. Programs Using I/O Streams.
9. Programs Using Files.
10. Programs Using Exception Handling.
11. Programs Using AWT.
12. Programs Using Swing.
13. Programs Using JDBC.

TOTAL: 45 PERIODS

COURSE OUTCOMES

After the successful completion of this course, the student will be able to

- Create GUI applications Using Java Swing
- Design Database application with JDBC connectivity
- Apply exception handling mechanism in java
- Compare the method overloading and method overriding in java
- Write programs with file handling concepts in java

HARDWARE AND SOFTWARE REQUIRMENTS

Hardware: Computers Required: 30 No"s.

Software:

1. Operating System: Ms-Windows 2000 / XP / NT or Linux
2. Java SE or Equivalent Edition.
3. Apache Tomcat Web Server.
4. MySql or Equivalent Database Product.

01UIT408	OPERATING SYSTEMS PRACTICE LABORATORY	L	T	P	C
		0	0	3	2

OBJECTIVES:

- To demonstrate operating system function calls, system calls and scheduling algorithm using UNIX operating system

LIST OF EXPERIMENTS

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. Develop an 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 deadlock detection and prevention algorithms.
9. Implement various memory management schemes (First, Best, Worst fit and Buddy schemes).
10. Implement various Page Replacement algorithms(FIFO, LRU)
11. Implement the file allocation techniques such as Linked, Indexed or Contiguous.
12. Implement various Disk Scheduling algorithms(FCFS, SSTF,SCAN, C-SCAN)

TOTAL: 45 PERIODS

COURSE OUTCOMES

After the successful completion of this course, the student will be able to

- Demonstrate process management and control
- Demonstrate various CPU scheduling algorithms
- Solve problems involving semaphores
- Develop various applications involving memory management, File Management
- Make use of various disk scheduling algorithms

HARDWARE AND SOFTWARE REQUIRMENTS

Hardware: Computers Required: 30 No"s.

Software:

1. Operating System: Ms-Windows 2000 / XP / NT or Linux
2. Java SE or Equivalent Edition.
3. Apache Tomcat Web Server.
4. MySql or equivalent Database Product.

01UEC427	**MICROCONTROLLERS AND MICROPROCESSORS LABORATORY (Common to CSE & IT)**	**L**	**T**	**P**	**C**
		0	**0**	**3**	**2**

OBJECTIVES:

- To introduce the basics of microprocessor and microcontroller Programming, interfacing and their applications.

LIST OF EXPERIMENTS

1. Programs for 8/16 bit Arithmetic operations (Using 8085).
2. Programs for Sorting and Searching (Using 8085).
3. Interfacing ADC and DAC.
4. Parallel Communication between two MP Kits using Mode 1 and Mode 2 of 8255.
5. Serial Communication between two MP Kits using 8251.
6. Interfacing and Programming 8279, 8259, and 8253.
7. Programs for 16 bit Arithmetic operations (Using 8086).
8. Programs for Sorting and Searching (Using 8086).
9. Programs for String manipulation operations (Using 8086).
10. Interfacing and Programming of Stepper Motor and DC Motor Speed control
11. Programs for Arithmetic, Logical and Bit manipulation (Using 8051).
12. Programming and verifying Timer, Interrupts and UART operations (Using 8051).
13. Communication between 8051 microcontroller kit and PC.
14. Traffic Light Control

TOTAL: 45 PERIODS

COURSE OUTCOMES

After the successful completion of this course, the student will be able to

- Apply the knowledge of arithmetic and logical operation programs using 8085, 8086 and 8051 assembly language
- Analyze the communication between two microprocessor kits using parallel communication and serial communication
- Evaluate the communication protocols using 8255 and 8251 for 8085 and 8051
- Apply and Compile programs using 8086 simulator
- Interface the peripheral devices such as 8279, 8253 and 8259 with microprocessor

HARDWARE AND SOFTWARE REQUIRMENTS

1. 8085 Trainer Kit -15
2. 8086 Trainer Kit -15
3. 8051 Trainer Kit -15
4. 8255 Interfacing Card - 3
5. 8279 Interfacing Card - 3
6. 8251 Interfacing Card - 3
7. ADC Interfacing Card - 3
8. DAC Interfacing Card - 3
9. Stepper Motor Interfacing Card - 3

SEMESTER V

Course Code	Course Title	L	T	P	C
THEORY					
01UMA521	Discrete Mathematics (Common to CSE & IT)	3	1	0	4
01UIT502	Computer Networks (Common to CSE & IT)	3	0	0	3
01UCS503	Object Oriented Analysis and Design (Common to CSE & IT)	3	0	0	3
01UIT504	Embedded Computing Systems	3	0	0	3
01UIT505	Graphics with OPENGL	3	0	0	3
01UIT506	Wireless Communication	3	0	0	3
PRACTICAL					
01UIT507	Computer Networks Laboratory (Common to CSE & IT)	0	0	3	2
01UCS508	Object Oriented Analysis and Design Laboratory (Common to CSE & IT)	0	0	3	2
01UIT509	Graphics Programming Laboratory	0	0	3	2
01UGS531	Soft skills and Communication Laboratory (Common to CSE,ECE,EEE & IT)	0	0	2	1
	TOTAL	18	1	11	26
Total No. of Credits - 26					

01UMA521	DISCRETE MATHEMATICS (Common to CSE & IT)	L	T	P	C
		3	1	0	4

OBJECTIVES:

- To make the student acquire sound knowledge to test the logic of program
- To familiarize the student to be aware of generating functions
- To develop an understanding of the concepts of graphs and Trees
- To acquaint the student with the concepts and properties of Lattices

UNIT I LOGIC AND PROOFS 9 + 3

Propositional Logic – Propositional equivalences - Predicates and quantifiers – Nested Quantifiers - Rules of inference - Introduction to Proofs - Proof Methods and Strategy.

UNIT II COMBINATORICS 9 + 3

Mathematical inductions - Strong induction and well ordering - The basics of counting – The pigeonhole Principle – Permutations and Combinations - Recurrence relations – Solving Linear recurrence relations - Generating functions - Inclusion and exclusion and applications.

UNIT III GRAPHS 9 + 3

Graphs and graph models - Graph terminology and special types of graphs – Representing graphs and graph isomorphism – Connectivity - Euler and Hamilton paths - Trees, Spanning Trees (Definitions and properties only).

UNIT IV ALGEBRAIC STRUCTURES 9 + 3

Algebraic systems - Semi groups and Monoids – Groups - Subgroups and Homomorphisms - Cosets and Lagrange"s theorem - Ring & Fields (Definitions and examples).

UNIT V LATTICES AND BOOLEAN ALGEBRA 9 + 3

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

TOTAL: 45 (L) + 15 (T) = 60 PERIODS

COURSE OUTCOMES:

After the successful completion of this course, the student will be able to

- Prove implication problems using truth table method, replacement process, analyzation method, truth table technique and rules of inference
- Use the basic of country in Pigeon hole principle find the solution for the given problem.
- Verify whether the given graph are isomorphic or not, Verify whether the given is ring (field) or not.
- Check the properties of Euler Hamiltonian graphs and also spanning trees.
- Write down the properties of Lattices sublattices and special type of lattices also.

TEXT BOOKS:

1. KENNETH H.ROSEN, “Discrete Mathematics and its Applications”, Special Indian Edition, Tata McGraw-Hill Pub. Co. Ltd., New Delhi, 5th Edition, (2008).
2. TREMBLY J.P and MANOHAR R, “Discrete Mathematical Structures with Applications to Computer Science”, Tata McGraw–Hill Pub. Co. Ltd, New Delhi, 35th Re-print, (2008).

REFERENCE BOOKS:

1. RALPH. P. GRIMALDI, “Discrete and Combinatorial Mathematics: An Applied Introduction”, Pearson Education, New Delhi, 4th Edition, (2002).
2. TAMILARASI.A, and NATARAJAN.A.M, “Discrete Mathematics and its Applications”, Khanna Publishers, New Delhi, 3rd Edition, (2008).
3. SEYMOUR LIPSCHUTZ and MARK LIPSON, “Discrete Mathematics”, Schaum‟s Outlines, Tata McGraw-Hill, New Delhi, 2nd Edition, (2007).
4. VEERARAJAN, T. “Discrete Mathematics with Graph Theory and Combinatorics”, Tata McGraw-Hill, New Delhi, 7th Edition, (2008).

01UIT502	COMPUTER NETWORKS (Common to CSE & IT)	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To introduce the functions of different layers
- To familiarize the network topologies and protocols
- To explain IEEE standard employed in computer networking

UNIT I PHYSICAL LAYER **9**

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

UNIT II DATALINK LAYER **9**

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

UNIT III NETWORK LAYER **9**

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

UNIT IV TRANSPORT LAYER **9**

UDP – TCP – Adaptive Flow Control – Adaptive Retransmission - Congestion control – Congestion avoidance – QoS – Techniques to improve QoS.

UNIT V APPLICATION LAYER **9**

Email (SMTP, MIME, IMAP, POP3) – HTTP – DNS- SNMP – Telnet – FTP – Security – PGP – SSH – Introduction to Transport layer security , IP Security, wireless security and Firewalls

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of this course, the student will be able to

- Apply the knowledge of various Physical Layers components
- Identify, formulate and analyze various link layer and physical layer protocols
- Identify the networks and analyze the flow of information between the nodes
- Apply the Knowledge of Transport layer to improve QoS in networks
- Apply the knowledge of various Application Layer protocols

TEXT BOOKS:

1. Larry L. Peterson, Bruce S. Davie, “Computer Networks: A Systems Approach”, Morgan Kauffmann Publishers Inc, Third Edition, 2007.
2. Behrouz A. Forouzan, “Data communications and networking”, McGraw-Hill Higher education, fourth Edition, 2010.

REFERENCE BOOKS:

1. James F. Kuross, Keith W. Ross, “Computer Networking, A Top-Down Approach Featuring the Internet”, Addison Wesley, Third Edition, 2004.
2. Nader F. Mir, ”Computer and Communication Networks”, Pearson Education, 2007.
3. Comer, “Computer Networks and Internets with Internet Applications”, Pearson Education, Fourth Edition, 2007.
4. Andrew S. Tanenbaum, “Computer Networks”, Fourth Edition, 2003.

01UCS503	OBJECT ORIENTED ANALYSIS AND DESIGN (Common to CSE & IT)	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To impart the knowledge of OOAD and system design using UML diagrams.
- To explain the fundamental design patterns for object-oriented analysis.
- To discuss how to apply state modeling to business entity classes and graphical notation for UML diagrams.
- To demonstrate about Mapping design to code and Testing.

UNIT I UML DIAGRAMS 9

Introduction to OOAD – Unified Process - UML diagrams – Use Case – Class Diagrams– Interaction Diagrams – State Diagrams – Activity Diagrams – Package, component and Deployment Diagrams.

UNIT II DESIGN PATTERNS 9

GRASP: Designing objects with responsibilities – Creator – Information expert – Low Coupling – High Cohesion – Controller - Design Patterns – creational - factory method - structural – Bridge – Adapter - Behavioral – Strategy – observer.

UNIT III CASE STUDY 9

Case study – the Next Gen POS system, Inception -Use case Modeling - Relating Use cases – include, extend and generalization - Elaboration - Domain Models - Finding conceptual classes and description classes – Associations – Attributes – Domain model refinement – Finding conceptual class Hierarchies - Aggregation and Composition.

UNIT IV APPLYING DESIGN PATTERNS 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 - Applying GoF design patterns.

UNIT V CODING AND TESTING 9

Mapping design to code – Testing: Issues in OO Testing – Class Testing – OO Integration Testing – GUI Testing – OO System Testing.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of this course, the student will be able to

- Explain fundamental concepts of object-oriented analysis and design.
- Apply system development design patterns and UML graphical notations.
- Describe different Use cases and conceptual class hierarchies.
- Prepare different UML diagrams based on use case narrative.
- Compare and contrast various testing techniques.

TEXT BOOKS:

1. Craig Larman, "Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development", Third Edition, Pearson Education, 2005.
2. G. Booch, J. Rumbaugh, and I. Jacobson: The Unified Modeling Language User Guide, Addison-Wesley, 1998.

REFERENCE BOOKS:

1. Simon Bennett, Steve Mc Robb and Ray Farmer, “Object Oriented Systems Analysis and Design Using UML”, Fourth Edition, Mc-Graw Hill Education, 2010.
2. Erich Gamma, a n d Richard Helm, Ralph Johnson, John Vlissides, **“**Design patterns: Elements of Reusable Object-Oriented Software”, Addison-Wesley, 1995.
3. Martin Fowler, “UML Distilled: A Brief Guide to the Standard Object Modeling Language”, Third edition, Addison Wesley, 2003.
4. Paul C. Jorgensen, “Software Testing”- A Craftsman‟s Approach”, Third Edition, Auerbach Publications, Taylor and Francis Group, 2008.

01UIT504	EMBEDDED COMPUTING SYSTEMS	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To explain the basic structure of embedded system
- To familiarize with modern hardware/software tools for building prototypes of embedded systems
- To summarize the current statistics of embedded systems

UNIT I INTRODUCTION TO EMBEDDED COMPUTING AND ARM PROCESSORS 9

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

UNIT II EMBEDDED COMPUTING PLATFORM DESIGN 9

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

UNIT III PROCESSES AND OPERATING SYSTEMS 9

Introduction – Multiple tasks and multiple processes – Multirate systems- Preemptive real-time operating systems- Priority based scheduling- Interprocess communication mechanisms – Evaluating Operating system performance- power optimization strategies for processes – Example Real time operating systems-POSIX-Windows CE.

UNIT IV SYSTEM DESIGN TECHNIQUES AND NETWORKS 9

Design methodologies- Design flows - Requirement Analysis – Specifications-System analysis and architecture design – Quality Assurance techniques- Distributed embedded systems – MPSoCs and shared memory multiprocessors.

UNIT V CASE STUDY 9

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

TOTAL: 45 PERIODS

COURSE OUTCOMES:

Upon completion of the course, students will be able to:

- Explain architecture and programming of ARM processor
- Analyze the performance characteristics of embedded systems
- Explain the basic concepts of real time Operating system design
- Apply the system design techniques to develop software for embedded systems
- Apply embedded systems to solve real world problems

TEXT BOOKS:

1. Marilyn Wolf, “Computers as Components - Principles of Embedded Computing System Design”, Third Edition “Morgan Kaufmann Publisher (An imprint from Elsevier), 2012.
2. Jonathan W.Valvano, “Embedded Microcomputer Systems Real Time Interfacing”, Third Edition Cengage Learning, 2012.

REFERENCE BOOKS:

1. David. E. Simon,” An Embedded Software Primer ”, 1st Edition, Fifth Impression, Addison- Wesley Professional, 2007.
2. Raymond J.A. Buhr, Donald L.Bailey, “An Introduction to Real-Time Systems- From Design to Networking with C/C++”, Prentice Hall, 1999.
3. C.M. Krishna, Kang G. Shin, “Real-Time Systems”, International Editions, Mc Graw Hill 1997
4. K.V.K.K.Prasad, “Embedded Real-Time Systems: Concepts, Design & Programming”, Dream Tech Press, 2005.

01UIT505	GRAPHICS WITH OPENGL	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To introduce the concepts and techniques used in two-dimensional and tree-dimensional computer graphics
- To familiarize with the algorithms and models for geometric projections, transformations, texture mapping, shading and lighting
- To review graphics programming with OpenGL

UNIT I 2D PRIMITIVES **9**

Output primitives – Line, Circle and Ellipse drawing algorithms - Attributes of output primitives– Two dimensional Geometric transformation - Two dimensional viewing – Line, Polygon, Curve and Text clipping algorithms

UNIT II 3D CONCEPTS **9**

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

UNIT III GRAPHICS PROGRAMMING **9**

Color Models – RGB, YIQ, CMY, HSV – Animations – General Computer Animation, Raster, Keyframe - Graphics programming using OPENGL – OpenGL basic graphics primitives- Draw 3D scenes interactively with OpenGL

UNIT IV RENDERING **9**

Introduction to Shading models – Flat and Smooth shading – add hidden surface removal - add texture to faces – add shadows of objects– GLSL– Creating shaded objects – Rendering texture – Drawing Shadows.

UNIT V FRACTALS **9**

Fractals and Self similarity - Mandelbrot sets –iterated functions – Draw the Mandelbrot sets – Introduction to Ray Tracing – Intersecting rays with other primitives – Adding Surface texture – Reflections and Transparency – Boolean operations on Objects.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of this course, the student will be able to

- Apply various algorithms for 2D primitives, geometric transformations and clipping
- Explain the 3D Object representation , transformations and viewing concepts
- Construct 2D & 3D graphics with OpenGL.
- Make use of rendering techniques to naturalize the scene
- Develop graphics application using animations

TEXT BOOKS:

1. Donald Hearn, Pauline Baker, “Computer Graphics C Version”, Pearson Education, second edition, 2004.
2. F.S. Hill,” Computer Graphics using OPENGL”, PHI Publications, Third edition, 2011.

REFERENCE BOOKS:

1. James D. Foley, Andries Van Dam, Steven K. Feiner, John F. Hughes, “Computer Graphics- Principles and practice”, Pearson Education, Second Edition, 2007.
2. Alan Watt, ” 3D Computer Graphics ”, 3rd ed. ISBN 0-20-139855-9.
3. Edward Angel, ” Interactive Computer Graphics, A Top-Down Approach Using OpenGL”, 5th edition.
4. Foley, van Dam, Feiner,” Hughes”, Computer Graphics: Principles and Practice, 3rd edition in C. ISBN 02013985590.

01UIT506	WIRELESS COMMUNICATION	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To familiarize with the wireless/mobile market and the future needs and challenges.
- To import mathematical models of radio wave propagation.
- To review the mobile/wireless communication systems.

UNIT I INTRODUCTION TO WIRELESS COMMUNICATION 9

Evolution of Mobile Radio Communication – Examples of Wireless Communication System – Cellular concept – Frequency Reuse – Channel assignment – Hand off – Interference & System capacity – Trunking and Erlang – capacity calculation – Improving coverage and capacity

UNIT II MOBILE RADIO WAVE PROPAGATION (LARGE SCALE FADING) 9

Radio wave Propagation – Transmit and receive Signal Models – Free Space path loss – Ray Tracing – Empirical Path loss models – Simplified path loss model – Shadow fading – Combine path loss and Shadowing – Outage Probability under path loss &shadowing – Cell coverage area.

UNIT III MOBILE RADIO WAVE PROPAGATION (SMALL SCALE FADING &MULTIPATH) 9

Small Scale Multipath Propagation – Impulse response model of a Multipath Channel – Small Scale Multipath Measurements – Parameters of Mobile Multipath Channels – Types of fading (fading effects due to Multipath Time Delay Spread & Doppler spread) – Rayleigh and Ricean Distribution.

UNIT IV CAPACITY, DIVERSITY AND EQUALIZATION IN WIRELESS SYSTEM 9

Capacity in AWGN – Capacity of Flat Fading Channels – Channel and System Model – Channel Distribution Information known – CSI at Receiver Diversity Technique – Selection combining – EGC – MRC – Feedback – Time – Frequency – Rake Receiver – Interleaving. Equalization – Linear Equalization – Non linear (DFE & MLSE) – Algorithm of Adaptive Equalization – Zero Frequency algorithm – LMS algorithm – Recursive Least Square algorithm.

UNIT V WIRELESS SYSTEMS AND STANDARDS 9

AMPS & ETACS System overview – Call handling – GSM System – Services and features – Architecture – Radio Subsystem – GSM Call – Frame Structure – Signal Processing – CDMA Digital Cellular Standard (IS-95) – Frequency & Channel Specification – Forward CDMA channel – Reverse CDMA channel. Introduction to OFDM system – Cyclic prefix – Matrix representation case study: IEEE 802.11a wireless LAN.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Acquire the knowledge in the working principles wireless architectures
- Analyze the various mobile propagation schemes
- Demonstrate knowledge in diversity reception techniques
- Compare various wireless communication standards
- Design a cellular system

TEXT BOOKS:

1. Rappaport T.S, “Wireless Communications: Principles and Practice”, Pearson education, 2nd edition, 2009.
2. William Stallings, “Wireless Communication &Networking”, Pearson Education Asia, 2009.

REFERENCE BOOKS:

1. Andrea Goldsmith, “Wireless Communications”, Cambridge University Press, Aug 2005.
2. Lee W.C.Y., “Mobile Communications Engineering: Theory & Applications”, McGraw Hill, New York 2nd Edition, 1998.
3. Feher K., “Wireless Digital Communications”, Prentice Hall, 1995.
4. Schiller, “Mobile Communication”, Pearson Education Asia Ltd., 2008.

01UIT507	COMPUTER NETWORKS LABORATORY (Common to CSE & IT)	L	T	P	C
		0	0	3	2

OBJECTIVES:

- To demonstrate the various Networking Protocols

LIST OF EXPERIMENTS

1. Implementation of Data Encryption and Decryption
2. Implementation of CRC
3. Implementation of Domain Name System
4. Implementation of sliding window protocol
5. Implementation of Stop and Wait protocol
6. Implementation of Distance Vector Routing protocol
7. Configure Network using Link State Vector Routing protocol
8. Write a program for Hamming Code generation for error detection and correction.
9. Implementation of ARP/RARP
10. Programs using TCP Sockets (like date and time server & client, echo server &client, etc.)
11. Programs using UDP Sockets (like simple DNS)
12. Study of Glomosim / OPNET

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Apply the knowledge of data Encryption and Decryption
- Identify Formulate Analyze the functionality of protocols
- Apply the Knowledge of basic functionality of protocols
- Identify and analyze the Error correction and detection to improve the QoS
- Identify the issues and analyze the outcome of the issues by Applying the knowledge of OPNET

HARDWARE AND SOFTWARE REQUIRMENTS

PCs, C++ Compiler, J2SDK (Freeware), Network simulators, NS2/Glomosim/OPNET (Freeware)

01UCS508	OBJECT ORIENTED ANALYSIS AND DESIGN LABORATORY (Common to CSE & IT)	L	T	P	C
		0	0	3	2

OBJECTIVES:

- To introduce the basics of OO analysis and design skills and familiarize with UML design diagrams.

LIST OF EXPERIMENTS

To develop a mini-project for the following exercises listed below.

1. To develop a problem statement.
2. Identify Use Cases and develop the Use Case model.
3. Identify the conceptual classes and develop a domain model with UML Class diagram.
4. Using the identified scenarios, find the interaction between objects and represent them using UML Sequence diagrams.
5. Draw relevant state charts and activity diagrams.
6. Identify the User Interface, Domain objects, and Technical services. Draw the partial layered, logical architecture diagram with UML package diagram notation.
7. Develop and test the Technical services layer.
8. Develop and test the Domain objects layer.
9. Develop and test the User interface layer.

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
14. Library Management System
15. Student Information System

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of this course, the student will be able to

- Design the projects using OO concepts.
- Use the UML analysis and design models
- Use the UML graphical notations for the appropriate diagrams
- Apply appropriate design patterns
- Convert design into code

HARDWARE AND SOFTWARE REQUIRMENTS

Hardware: Standalone desktops 30 Nos

Software: Rational Suite, Open Source Alternatives: ArgoUML, Visual Paradigm, Eclipse IDE and JUnit

01UIT509	GRAPHICS PROGRAMMING LABORATORY	L	T	P	C
		0	0	3	2

OBJECTIVES:

- To demonstrate the 2D,3D and geometric transformation using OPENGL

LIST OF EXPERIMENTS

1. Implementation of Bresenhams Algorithm – Line, Circle, Ellipse.
2. Implementation of Line, Circle and ellipse attributes.
3. Two Dimensional transformations - Translation, Rotation, Scaling, Reflection, Shear.
4. Composite 2D Transformations.
5. Cohen Sutherland 2D line clipping and Windowing
6. Sutherland – Hodgeman Polygon clipping Algorithm.
7. Three dimensional transformations - Translation, Rotation, Scaling.
8. Composite 3D transformations.
9. Implement a color models using OpenGL.
10. Projection of the 3D image using OpenGL.
11. Draw three dimensional object & scenes using OpenGL.
12. Draw at least four basic graphics primitives using OpenGL.
13. Generating Fractal images using OpenGL.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Develop applications for geometric transformation.
- Construct graphical functions using graphics primitives.
- Compare 2D & 3D transformations
- Apply different aspects of color in computer graphics.
- Develop an animation application using OpenGL

HARDWARE AND SOFTWARE REQUIRMENTS

Minimum Hardware Requirements: (for a batch of 30 students)

Intel Pentium III800 MHz Processor or higher version, Intel chipset 810 mother board or higher version, 14"" color monitor or greater than that Mouse, Keyboard, 2GB HDD or greater, 256 MB RAM or greater

Software Requirements: Turbo C / C++ compiler that supports graphics.h package.

Special DOSBOXed installer for Turbo C++ compiler

	SOFT SKILLS AND COMMUNICATION LABORATORY	L	T	P	C
01UGS531	(Common to CSE, ECE, EEE & IT)	0	0	2	1

OBJECTIVES :

- To develop a requisite knowledge in soft skills and communication skills.
- To understand long texts and be able to orally summarize complex reports, commentaries and correspondence with the occasional use of a dictionary, and extract ideas and opinions.

UNIT I COMMUNICATION SKILL 10

Listening to the Conversation - Introducing oneself before audience - Group Discussion - Formal Letter writing – E- Mail Etiquettes - Power Point Presentation

UNIT II PREPARATION FOR INTERVIEWS 10

Preparation of Resume - Difference between Bio-data and CV- Visiting Company Web site - Gathering Information about Company - Mode of Selection - Different types of Selection Methods – Pre-placement Talk - Attitude before Interview

UNIT III INTERVIEW SKILL 10

Body Language - Types of Interview - Attending Telephonic Interview – Do"s and Don"ts during and after the Interview - Expectation of the Interviewer - Mock Interview.

TOTAL: 30 PERIODS

COURSE OUTCOMES:

After the successful completion of this course, the student will be able to:

- Explain the social and personal values of life
- Describe the importance of human rights
- Analyze key issues related to values of life and human rights and propose appropriate solutions to the situations

REFERENCE BOOKS:

1. Dr. K.Alex, Soft Skills, know yourself and know the world, Second Revised Edtion2011, S Chand Publication New Delhi-110055
2. Anderson, P.V, Technical Communication, Thomson Wadsworth, Sixth Edition, New Delhi, 2007.

HARDWARE AND SOFTWARE REQUIRMENTS

Software: Globarena and CDs Generated by the Department of English
Hardware: 60 Systems & LCD Projector with Speakers

SEMESTER VI

Course Code	Course Title	L	T	P	C
THEORY					
01UIT601	Service Oriented Architecture	3	0	0	3
01UIT602	Compiler Design	3	0	0	3
01UIT603	Web Technology	3	0	0	3
01UIT604	Cryptography and Network Security	3	0	0	3
	Elective–I	3	0	0	3
	Elective– II	3	0	0	3
PRACTICAL					
01UIT607	Service Oriented Architecture Laboratory	0	0	3	2
01UIT608	Web Technology Laboratory	0	0	3	2
01UIT609	Network Security Laboratory	0	0	3	2
01UIT610	Mini Project / Technical Seminar	0	0	2	1
	TOTAL	18	0	11	25
Total No. of Credits - 25					

01UIT601	SERVICE ORIENTED ARCHITECTURE	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To introduce the service oriented analysis techniques
- To import the technology underlying the service design
- To demonstrate the SOA platforms and WS specification standards

UNIT I INTRODUCTION **9**

SOA Introduction - 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 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 COMMUNICATION AND SOA **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 PLATFORMS **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 STANDARDS **9**

WS-BPEL Language basics – history of BPEL4WS -WS-BPEL Elements - Oracle SOA Suite - WS-Coordination overview – WS-Coordination Elements - WS-Business Activity coordination - WS-Atomic Transaction coordination - WS-Choreography - WS-Policy – WS-Policy Elements- policy assertions , WS Security – WS Security Elements - XML-Signature elements

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Explain the client server and distributed architecture
- Analyze the significance of service orientation architecture and web services
- Make use of Communication techniques for an appropriate service
- Select the suitable SOA platform for an application
- Create the WS specification standards for an applications

TEXT BOOKS:

1. Thomas Erl, “Service-Oriented Architecture: Concepts, Technology, and Design”, The prentice Hall publications 2005.
2. Raja Balasubramaniun, Benjamin Carlyle, Thomas Erl, “SOA with REST: Principles, Patterns& Constraints for enterprise Solutions with rest”, Prentice Hall Service Technology series from Thomas Erl, 2012.

REFERENCE BOOKS:

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

01UIT602	COMPILER DESIGN	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To introduce the phases of operation of a compiler
- To familiarize the design and implementation of a lexical analyzer and parser
- To demonstrate the code generation and optimization

UNIT I LEXICAL ANALYSIS 9

Introduction to Compiling- Compilers-Analysis of the source program-The phases- Cousins-The grouping of phases-Compiler construction tools. The role of the lexical analyzer- Input buffering-Specification of tokens-Recognition of tokens-A language for specifying lexical analyzer.

UNIT II SYNTAX ANALYSIS and RUN-TIME ENVIRONMENTS 9

Syntax Analysis- The role of the parser-Context-free grammars-Writing a grammar - Topdown parsing-Bottom-up Parsing-LR parsers-Constructing an SLR(1) parsing table. Type Checking- Type Systems-Specification of a simple type checker. Run-Time Environments-Source language issues-Storage organization-Storage-allocation strategies.

UNIT III INTERMEDIATE CODE GENERATION 9

Intermediate languages-Declarations-Assignment statements - Boolean expressions-Case statements- Backpatching-Procedure calls

UNIT IV CODE GENERATION 9

Issues in the design of a code generator- The target machine-Run-time storage management-Basic blocks and flow graphs- Next-use information-A simple code generator-Register allocation and assignment-The DAG representation of basic blocks - Generating code from DAG.

UNIT V CODE OPTIMIZATION 9

Introduction-The principle sources of optimization-Peephole optimization- Optimization of basic blocks-Loops in flow graphs- Introduction to global data-flow analysis-Code improving transformations.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Apply the knowledge of lexical analysis phase to solve the problem of tokenization of a sequence of characters
- Apply the knowledge of parsers to solve syntax analysis phase of programming statements
- Analyze intermediate code generation and formulate intermediate codes for the output of syntax analyzer
- Identify and analyze the issues of code generation using the principles of register allocation and assignment
- Apply various techniques on generated intermediate codes to solve the problem of code optimization

TEXT BOOKS:

1. Alfred V. Aho, Ravi Sethi Jeffrey, D. Ullman, “Compilers- Principles, Techniques, and Tools”, Pearson Education Asia,2007.
2. David Galles, “Modern Compiler Design”, Pearson Education Asia, 2007.

REFERENCE BOOKS:

1. Steven S. Muchnick, Morgan, “Advanced Compiler Design & Implementation”, Morgan Kaufmann, 2000.
2. C. N. Fisher, R. J. LeBlanc, “Crafting a Compiler with C”, Pearson Education, 2000.
3. A. A. Puntambekar, “Compiler Design”, Technical Publications, 2010.
4. Raghavan, “Principles of Compiler Design”, Tata Mc-Graw Hill Education, 2010.

01UIT603	WEB TECHNOLOGY	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To introduce the essentials of web and markup languages
- To import the HTML & XHTML elements and the basics of client server programming
- To summarize the Document Object Model, XML and C# & .NET framework

UNIT I INTRODUCTION **9**

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

UNIT II CSS AND CLIENT SIDE PROGRAMMING **9**

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

UNIT III CLIENT SIDE PROGRAMMING & DOM **9**

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

UNIT IV XML AND JSP **9**

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

UNIT V .NET FRAMEWORK **9**

VBScript fundamentals – ASP concepts Introducing .NET framework – Brief history – Building blocks of .NET platform –Role of .NET class libraries – Understanding CTS, CLR, CLS – Deploying .NET – Building C# applications-Case Study-Related Technologies.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Design and develop web pages using HTML and DHTML
- Interpret the role of Cascading Style Sheets and Scripting in web applications
- Compare and contrast server side technologies
- Infer the knowledge of MVC architecture supported by different frameworks
- Build web based applications for the enterprises

TEXT BOOKS:

1. Jeffrey C.Jackson, “Web Technologies A Computer Science Perspective”, Pearson Education, 2006.
2. Harvey Deitel, Abbey Deitel, “Internet and World Wide Web: How to Program” 5th Edition.

REFERENCE BOOKS:

1. Christian Nagel, “Professional C# 2005 with .NET 3.0”, Wiley India, 2007.
2. Marty Hall, Larry Brown,” Core Web Programming”, Pearson Education”, Fourth Edition, 2007.
3. Robert. W, Sebesta, “Programming the World Wide Web”, Pearson Education, Fourth Edition, 2007.
4. Bates,” Developing Web Applications”, Wiley, 2006.

01UIT604	CRYPTOGRAPHY AND NETWORK SECURITY	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To familiarize the symmetric and asymmetric encryption algorithms
- To explain the authentication and Hash functions for improved security
- To review the network security applications such as firewalls, IDS and trusted systems

UNIT I INTRODUCTION TO CRYPTOGRAPHY 9

Security trends – Attacks and services – Classical crypto systems – Different types of ciphers – Basic Number theory – Groups, Rings, Fields – Modular Arithmetic –Euclidean Algorithm- Finite Fields of the form GF (p), Polynomial Arithmetic-Finite fields of the form GF(2^n) –Prime Numbers - Fermat and Euler's theorem.

UNIT II SYMMETRIC CIPHERS 9

Testing for Primality - Chinese Remainder theorem– Simple DES – Differential cryptanalysis – DES – Modes of operation – Triple DES – AES – RC4

UNIT III HASH FUNCTIONS AND PUBLIC KEY CRYPTOGRAPHY 9

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

UNIT IV AUTHENTICATION APPLICATIONS 9

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

UNIT V SYSTEM SECURITY 9

System security – Intruders IDS – Honey pots – Malicious software – viruses – Firewalls – Security Standards.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Apply the knowledge of mathematical concepts to cryptography
- Analyze the Strength of symmetric cipher algorithm
- Apply Public Key Cryptography and Make use of Hash Functions in cryptography techniques
- Select an appropriate techniques for Authentication applications
- Analyze the Network security design using available secure solutions

TEXT BOOKS:

1. William Stallings, “Cryptography and Network security Principles and Practices”, Pearson/PHI, 4th Edition, 2006.
2. BehrouzA.Foruzan,”Cryptography and Network Security”, Tata McGraw Hill, 2007.

REFERENCE BOOKS:

1. Behrouz A.Foruzan, “Cryptography and Network Security”, Tata McGraw Hill, 2007.
2. W. Mao, “Modern Cryptography Theory and Practice”, Second Edition, Pearson Education, 2007.
3. Bruce Schneier, “Applied Cryptography”, Second Edition, John Willey and Sons, 2002. ISBN: 9971-51-348-X.
4. Roberta Bragg, Mark Rhodes, Keith Strassberg, “Network Security”, Tata Mcgraw Hill Edition, 2004. ISBN-13: 978-0-07-058671-0.

01UIT607	SERVICE ORIENTED ARCHITECTURE LABORATORY	L	T	P	C
		0	0	3	2

OBJECTIVES:

- To demonstrate SOA applications Using .NET Framework

LIST OF EXPERIMENTS

1. Develop a program to implement invoice Order Processing using .NET component
2. Develop a program to implement Payment processing using .NET component
3. Develop a program to implement invoice Order Processing using EJB component
4. Develop a program to implement Payment processing using EJB component
5. Develop a program for implement calculator and to calculate simple and complex interest using .NET
6. Develop a program for calculate Library management processing using EJB component
7. Develop a program for calculate Library management processing using .NET component
8. Invoke .NET components as web services.
9. Invoke EJB components as web services.
10. Develop a Service Orchestration Engine (workflow) using WS-BPEL and implement service composition. For example, a business process for planning business travels will invoke several services. This process will invoke several airline companies (such as Air India, Indian Railways etc.) to check the airfare price and buy at the lowest price.
11. Develop a J2EE client to access a .NET web service.
12. Develop a .NET client to access a J2EE web service.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Develop programs using service oriented analysis and design
- Apply component based model in service oriented architecture
- Develop a service orchestration Engine using WS-BPEL
- Design an application using .NET and J2EE web service
- Apply WS-BPEL services in service orchestration Engine
-

HARDWARE AND SOFTWARE REQUIRMENTS

Hardware: CPU: (As Server) Processor (Core 2 Quad or equivalent) with good speed, 2GBRAM, 300GBHDD.

Software: .NET framework (MS Academic Alliance) (or) Express Edition, J2EE framework free download, OS – Windows or Linux.

01UIT608	WEB TECHNOLOGY LABORATORY	L	T	P	C
		0	0	3	2

OBJECTIVES:

- To demonstrate web services and Web pages Using DHTML and Scripting Languages

LIST OF EXPERIMENTS

1. To create a simple HTML file to demonstrate the use of different tags (frames, links, tables etc)
2. To 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
3. To create a web page with all types of Cascading style sheets
4. To create a scientific calculator using JavaScript
5. To create a Client Side Scripts for Validating Web Form Controls using DHTML
6. Write programs in Java to create applets incorporating the following features:
    i. Create a color palette with matrix of buttons
    ii. Set background and foreground of the control text area by selecting a color from color palette.
    iii. In order to select Foreground or background use check box control as radio buttons
    iv. To set background images
7. Write programs in Java using Servlets:
    i. To invoke servlets from HTML forms
    ii. To invoke servlets from Applets
8. Write programs in Java to create three-tier applications using JSP and Databases
9. Write Programs using XML – Schema – XSLT/XSL
10. Programs using AJAX
11. Write Programs using C# and .NET
12. Consider a case where we have two web Services- an airline service and a travel agent and the travel agent is searching for an airline. Implement this scenario using Web Services and Data base

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Design and develop web pages using HTML, DHTML and Cascading Style Sheets
- Demonstrate the creation of interactive web pages
- Adapt client side and server side scripting
- Write XML schema for an application
- Build web based systems for the enterprises using technology like JSP, Servlet, C# and ASP.NET

HARDWARE AND SOFTWARE REQUIRMENTS

Hardware: Standalone Desktops – 30 Nos
Software: Java, Dream Weaver or Equivalent, MySQL or Equivalent, Apache Server

01UIT609	NETWORK SECURITY LABORATORY	L	T	P	C
		0	0	3	2

OBJECTIVES

- To demonstrate the Network Security Concepts with different Algorithms and Techniques

LIST OF EXPERIMENTS

1. Study of TCP and UDP Sockets
2. Study of TCP/UDP performance
3. Implement the following SUBSTITUTION &TRANSPOSITION TECHNIQUES concepts:
   a) CaesarCipher
   b) PlayfairCipher
   c) Hill Cipher
   d) Vigenere Cipher
   e) Rail fence–row & Column Transformation
4. Implement the following algorithms
   a) DES
   b) RSA Algorithm
   c) Diffiee-Hellman
   d) MD5
   e) SHA-1
5. Implement the SIGNATURE SCHEME-Digital Signature Standard
6. Demonstrate how to provide secure data storage, secure data transmission and for creating digital signatures (GnuPG).
7. Set up a honeypot and monitor the honeypot on network(KF Sensor)
8. Installation of rootkits and study about the variety of options
9. Perform wireless auditon an access point or a router and decrypt WEP and WPA.(NetStumbler)
10. Demonstrate intrusion detection system(ids)using any tool (snortor any other s/w)
11. Performance comparison of MAC protocols
12. Performance comparison of routing protocols

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Apply the classical cipher techniques for Network Security
- Develop various symmetric and asymmetric security algorithms
- Identify the different open source tools for network security analysis
- Analyze the network security designs using available secure solutions
- Analyze the Performance of Network Security Protocols

HARDWARE AND SOFTWARE REQUIRMENTS

Hardware: Standalone desktops -30 Nos. OR Server supporting 30 terminals or more.
Software: C / C++ / Java or equivalent compiler, GnuPG, KF Sensor or Equivalent, Snort, Net Stumbler or Equivalent, Opnet.

01UIT610	MINI PROJECT / TECHNICAL SEMINAR	L	T	P	C
		0	0	2	1

OBJECTIVES

- To engage the student in integrated activities of reading ,research, discussion and presentation around a designated subject

This course is introduced to enrich the communication skills of the student and to create awareness on recent development in Electronic and Instrumentation through Technical presentation. In this course, a student has to present at least two Technical papers or recent advances in engineering/technology that will be evaluated by a committee constituted by the Head of the Department.

COURSE OUTCOMES

After successful completion of this course the students will be able to:

- Identify and formulate a technical problem to reach substantiated conclusion using basic technical knowledge
- Design or Develop prototype model for societal needs applying the basic engineering knowledge
- Evaluate the performance of the developed solution using appropriate techniques and tools
- Apply management principles to function as a team
- Communicate the technical information effectively

SEMESTER VII

Course Code	Course Title	L	T	P	C
THEORY					
01UME701	Project Management And Finance	3	0	0	3
01UIT702	Advanced Database Systems	3	0	0	3
01UIT703	Mobile Communication Systems	3	0	0	3
01UIT704	High Performance Networks	3	0	0	3
	Elective III	3	0	0	3
	Elective IV	3	0	0	3
PRACTICAL					
01UIT707	Mobile Communication Systems Laboratory	0	0	3	2
01UIT708	Advanced Database Systems Laboratory	0	0	3	2
	TOTAL	18	0	6	22
Total No. of Credits - 22					

01UME701	PROJECT MANAGEMENT AND FINANCE (COMMON TO MECH, CSE, ICE, ECE, EEE, IT & EIE)	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To impart knowledge to find solutions and approaches for various projects.
- To familiarize the utilization of project within time, resource and financial constraints.

UNIT I PROJECT MANAGEMENT CONCEPTS 9

Concept and characteristics of a project, importance of project management, types of project, project organizational structure, project life cycle, Statement of Work, Work Breakdown Structure.

UNIT II PROJECT PLANNING 9

Project Planning and Scheduling techniques - developing the project network USING CPM/PERT, constructing network diagram, AON basics, Forward Pass and backward pass, Limitations of CPM/PERT, Precedence Diagramming Method, constructing diagram and computations using precedence diagramming method, PERT/CPM simulation, reducing project duration.

UNIT III RESOURCE SCHEDULING & CRITICAL CHAIN SCHEDULING 9

. Resource Scheduling - Resource allocation method, splitting and multitasking, Multi project resources scheduling - Critical Chain Scheduling -Concept of critical chain scheduling - critical chain scheduling method, application of Critical chain scheduling and limitations.

UNIT IV PROJECT QUALITY MANAGEMENT 9

Concept of project quality, responsibility for quality in projects, quality management at different stages of project, tools and techniques, Quality Management Systems, TQM in projects - Project performance Measurement and Control - Monitor and assess project performance, schedule, and cost. Earned value Management, performance measurement. methods to monitor, evaluate, and control planned cost and schedule performance - Project Closure/ Termination - Meaning of closure/ termination, project audit process, termination steps, final closure.

UNIT V FINANCIAL ACCOUNTING 9

Balance sheet and related concepts - Profit & Loss Statement and related concepts - Financial Ratio Analysis - Cash flow analysis - Funds flow analysis – Comparative financial statements - Analysis & Interpretation of financial statements. Investments - Risks and return evaluation of investment decision - Average rate of return - Payback Period - Net Present Value - Internal rate of return.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of this course, the student will be able to

- Discuss various characteristics and importance of project management.
- Use CPM/ PERT network for finding minimum project duration.
- Compare various scheduling methods.
- Justify various tools and techniques at different stages of quality management.
- Discuss financial ratios, cash flow and fund flow analysis.

TEXT BOOKS:

1. Clifford F Gray, Erik W Larson, “Project Management-The Managerial Process ”, Tata Mcgraw-Hill Publishing Co Ltd.
2. Prasanna Chandra, “'Fundamentals of Financial Management' ”, Tata Mcgraw-Hill Publishing Ltd, 2005.

REFERENCE BOOKS:

1. Jack Meredith, Samuel J,Mantel Jr, “Project Management- A Managerial Approach ”, John Wiley and Sons.
2. John M Nicholas, “Project Management For Business And Technology”, Prentice Hall Of India Pvt Ltd.
3. Paresh Shah, “Basic Financial Accounting for Management ”, Oxford University Press, 2007.
4. Rick A Morris, “The Everything Project Management Book ”, 2008

01UIT702	ADVANCED DATABASE SYSTEMS	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To import the needs of different databases
- To introduce the transaction management of the database
- To be familiarize in web ,intelligent and real time database

UNIT I PARALLEL DATABASES **9**

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

UNIT II OBJECT ORIENTED DATABASES **9**

Object Oriented Databases – Introduction – Weakness of RDBMS – Object Oriented Concepts Storing Objects in Relational Databases – Next Generation Database Systems – Object Oriented Data models – OODBMS Perspectives – Persistence – Issues in OODBMS – Object Oriented Database Management System Manifesto – Advantages and Disadvantages of OODBMS – Object Oriented Database Design – OODBMS Standards and Systems – Object Management Group – Object Database Standard ODMG – Object Relational DBMS–Postgres - Comparison of ORDBMS and OODBMS.

UNIT III WEB DATABASES **9**

Web Technology And DBMS – Introduction – The Web – The Web as a Database Application Platform – Scripting languages – Common Gateway Interface – HTTP Cookies – Extending the Web Server – Java – Microsoft"s Web Solution Platform – Oracle Internet Platform – Semi structured Data and XML – XML Related Technologies – XML Query Languages.

UNIT IV INTELLIGENT DATABASES **9**

Enhanced Data Models For Advanced Applications – Active Database Concepts And Triggers – Temporal Database Concepts – Deductive databases – Knowledge Databases.

UNIT V CURRENT TRENDS **9**

Mobile Database – Geographic Information Systems – Genome Data Management – Multimedia Database – Parallel Database – Spatial Databases – Database administration – Data Warehousing and Data Mining.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Choose the appropriate database system architecture
- Develop an application using OODBMS
- Make use of web technology to construct a web database
- Explain the enhanced Data Models for Intelligent database
- Analyze the current trend in databases

TEXT BOOKS:

1. Thomas M. Connolly, Carolyn E. Begg," Database Systems - A Practical Approach to Design, Implementation, and Management", Pearson Education, Third Edition, 2003.
2. RamezElmasri, Shamkant B.Navathe," Fundamentals of Database Systems", Pearson Education, Fourth Edition, 2004.

REFERENCE BOOKS:

1. PeterRob, Corlos Coronel," Database Systems – Design, Implementation and Management", Thompson Learning, Course Technology, 5th Edition, 2003.
2. Prabhu C.S.R," Object Oriented Database Systems", PHI, 2003.
3. Subramanian V.S., "Principles of Multimedia Database Systems", Harcourt India Pvt Ltd, 2001.
4. Vijay Kumar," Mobile Database Systems", John Wiley & Sons, 2006.

01UIT703	MOBILE COMMUNICATION SYSTEMS	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To introduce various wireless voice and data communications technologies
- To be familiarize with the working principles of wireless LAN and its standards
- To demonstrate and develop skills in working with Wireless application Protocols

UNIT I WIRELESS COMMUNICATION 8

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

UNIT II WIRELESS NETWORKS 9

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

UNIT III MOBILE COMMUNICATION SYSTEMS 10

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

UNIT IV MOBILE NETWORK AND TRANSPORT LAYERS 9

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

UNIT V APPLICATION LAYER 9

WAP Model- Mobile Location based services -WAP Gateway –WAP protocols – WAP user agent profile- caching model-wireless bearers for WAP - WML – WML Scripts - WTA - iMode- SyncML

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Explain different multiple access techniques
- Compare the various wireless local networks
- Make use of the protocol and system architecture of GSM and GPRS for real world application
- Categorize various TCP Mechanism for mobile networks
- Analyze the various protocols under the architecture of Wireless Application Protocol

TEXT BOOKS:

1. Jochen Schiller, ”Mobile Communications”, Pearson Education, Second Edition, 2003.
2. William Stallings,” Wireless Communications and Networks”, Pearson Education, 2002.

REFERENCE BOOKS:

1. Kaveh Pahlavan, Prasanth Krishnamoorthy, “Principles of Wireless Networks”, Pearson Education, First Edition, 2003.
2. UweHansmann, Lothar Merk, Thomas Stober,” Principles of Mobile Computing”, Springer, 2003.
3. C.K.Toh, “AdHoc Mobile Wireless Networks”, Pearson Education, First Edition, 2002.
4. Lawrence Harte, “3G Wireless Demystified”, McGraw Hill Publications, 2001.

01UIT704	HIGH PERFORMANCE NETWORKS	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To import the knowledge in ATM and frame relay
- To explain the techniques involved to support real-time traffic and congestion control
- To summarize the different levels of quality of service to various applications

UNIT I HIGH SPEED NETWORKS 9

Frame Relay Networks-Asynchronous transfer mode–ATM Protocol Architecture, ATM logical Connection, ATM Cell-ATM Service Categories-AAL. High Speed LANs: Fast Ethernet, Gigabit Ethernet, Fiber Channel- Wireless LANs: applications, requirements - Architectureof802.11

UNIT II CONGESTION AND TRAFFIC MANAGEMENT 9

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

UNIT III TCP AND ATM CONGESTION CONTROL 9

TCP Flow control-TCP Congestion Control- Retransmission-Timer Management-Exponential RTO back off - KARN's Algorithm-Window management-Performance of TCP over ATM. Traffic and Congestion control in ATM-Requirements- Attributes- Traffic Management Framework, 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 & Characteristics, Data Flow, RSVP operations, Protocol Mechanisms -Multiprotocol Label Switching-Operations, Label Stacking, Protocol details- RTP- Protocol Architecture, Data Transfer Protocol, RTCP.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Classify various aspects of High Speed Networks
- Analyze the effect of congestion control and traffic
- Explain the performance of TCP and ATM Congestion Control
- Make use of various integrated and differentiated services
- Compare different levels of QOS and supporting protocols

TEXT BOOKS:

1. William Stallings, ”High Speed Networks and Internet”, Pearson Education, Second Edition, 2002.
2. Warland, Pravin Varaiya,”High Performance Communication Networks”, Jean Harcourt AsiaPvt.Ltd,IIEdition,2001.

REFERENCEBOOKS:

1. Irvan Pepelnjk, Jim Guichard, Jeff Apcar, “MPLS and VPN architecture”, Cisco Press,volume1 and 2,2003..
2. Kurose J.F,Ross K.W, ”Computer Networking-A top down approach featuring the internet”, Pearson,2nd edition,2003.
3. Walrand.J, Varatya,”High performance communication network”, Morgan Kauffman – HarcourtAsiaPvt.Ltd,2nd Edition,2000.
4. Leom-Garcia, Widjaja, ”Communication networks”, TMH, seventh reprint,2002.

01UIT707	MOBILE COMMUNICATION SYSTEMS LABORATORY	L	T	P	C
		0	0	3	2

OBJECTIVES:

- To demonstrate and develop the Mobile Application using various Tools and Techniques

LIST OF EXPERIMENTS

1. Write a program to build an Android Application
    a) Display Hello World
    b) Implement Sub Menu
    c) Implement Context menu (Floating List of Menu Items)
2. Write a program to display the views of different attributes.
    a) Relative Layout Views
    b) Linear Layout Views
3. Write a program to implement a menu which uses check-able items in Menu.
4. Write a program to implement a Custom Button and handle the displayed message on button press.
5. Write a program to implement the Table layout in View Group that displays child View elements in rows and columns.
6. Write a program to implement tween animation and rotate the text in your android application.
7. Write a program to show how to use Date picker control of ADK in your android applications.
8. Write a program which enables you to draw an image using bitmap class object.
9. Write a program which allows you to get image from web and displayed them using the Image view.
10. Write a program which shows you how to create a scroll view when text is not visible on one page.
11. Write a program which will shows you how to run any video file.
12. Create an Android application for the following.
    a) Body Mass Index (BMI)
    b) Currency Converter
    c) Suduko Game

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Apply the knowledge of various layouts to build an Android Application
- Select and apply appropriate menu and controls buttons
- Apply the knowledge of animation to build an Android Application
- Create , Select and Apply the appropriate Knowledge of ADK in your android Application
- Identify, formulate and analyze the robust & scalable features of your Android applications

HARDWARE AND SOFTWARE REQUIRMENTS

Standalone desktops with Windows or Android or iOS or Equivalent Mobile Application Development Tools with appropriate emulators and debuggers - 30 Nos.

01UIT708	ADVANCED DATABASE SYSTEMS LABORATORY	L	T	P	C
		0	0	3	2

OBJECTIVES:

- To demonstrate and design an efficient database for various applications

LIST OF EXPERIMENTS:

DISTRIBUTED DATABASE

Consider a distributed database for a bookstore with 4 sites called S1, S2, S3 and S4. Consider the following relations:
Books (ISBN, primary Author, topic, total Stock, price)
Book Store (store No, city, state, zip, inventory Value)
Stock (store No, ISBN, Qty)
Total Stock is the total number of books in stock and inventory Value is the total inventory value for the store in dollars.

1. Consider that Books are fragmented by price amounts into:

F1: Books: price up to $20
F2: Books: price from $20.01 to $50
F3: Books: price from $50.01 to $100
F4: Books: price $100.01 and above
Write SQL query for the following

i. Insert and Display details in each table.
ii. Find the total number of books in stock where price is between $15 and $55.

2. Consider that Book Stores are divided by ZIP codes into:

S1: Bookstore: Zip up to 25000
S2: Bookstore: Zip 25001 to 50000
S3: Bookstore: Zip 50001 to 75000
S4: Bookstore: Zip 75001 to 99999
Write SQL query for the following

i. Update the book price of book No=1234 from $45 to $55 at site S3.
ii. Find total number of book at site S2.

OBJECT ORIENTED DATABASE

A University wants to track persons associated with them. A person can be an Employee or Student. Employees are Faculty, Technicians and Project associates. Students are Full time students, Part time students and Teaching Assistants.

3. Design an Enhanced Entity Relationship (EER) Model for university database. Write OQL for the following

i. Insert details in each object.
ii. Display the Employee details.

4. Design an Enhanced Entity Relationship (EER) Model for university database. Write OQL for the following

i. Display Student Details.

ii. Modify person details.
iii. Delete person details.

PARALLEL DATABASE

5. Consider the application for University Counseling for Engineering Colleges. The college, department and vacancy details are maintained in 3 sites. Students are allocated colleges in these 3 sites simultaneously. Implement this application using parallel database [State any assumptions you have made].
6. There are 5 processors working in a parallel environment and producing output. The output record contains college details and students mark information. Implement parallel join and parallel sort algorithms to get the marks from different colleges of the university and publish 10 ranks for each discipline.

XML

Design XML Schema for the given company database
Department (deptName, deptNo, deptManagerSSN, deptManagerStartDate, deptLocation)
Employee (empName, empSSN, empSex, empSalary, empBirthDate, empDeptNo, empSupervisorSSN, empAddress, empWorksOn)
Project (projName, projNo, projLocation, projDeptNo, projWorker)

7. Implement the following queries using XQuery and XPath
   i. Retrieve the department name, manager name, and manager salary for every department.
   ii. Retrieve the employee name, supervisor name and employee salary for each employee who works in the Research Department.
   iii. Retrieve the project name, controlling department name, number of employees and total hours worked per week on the project for each project.
   iv. Retrieve the project name, controlling department name, number of employees and total hours worked per week on the project for each project with more than one employee working on it.

8. Implement a storage structure for storing XML database and test with the above schema.
9. Create applications using Triggers.
10. Create application using Temporal/Deductive/Knowledge database.
11. Develop an application using mobile database.

WEKA TOOL

12. Work with Weka tool classification and clustering algorithms using the given training data and test with the unknown sample. Also experiment with different scenarios and large data set.

RID	Age	Income	Student	Credit_rating	Class: buys_computer
1	youth	high	no	fair	no
2	youth	high	no	excellent	no
3	middle_aged	high	no	fair	yes
4	senior	medium	no	fair	yes
5	senior	low	yes	fair	yes
6	senior	low	yes	excellent	no
7	middle_aged	low	yes	excellent	yes
8	youth	medium	no	fair	no

9	youth	low	yes	fair	yes
10	senior	medium	yes	fair	yes
11	youth	medium	yes	excellent	yes
12	middle_aged	medium	no	excellent	yes
13	middle_aged	high	yes	fair	yes
14	senior	medium	no	excellent	no

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Apply the concepts of distributed and object oriented databases
- Make use of the features of parallel database
- Apply the clustering and classification using weka tool
- Develop application using XML and work on it
- Apply query evaluation and optimization techniques

HARDWARE AND SOFTWARE REQUIRMENTS

Computer Required: 30 No‟s

Minimum Requirement: Processor: Pentium IV, Ram: 1 GB, Hard Disk: 80 GB Software Requirements:

Operating System: Linux (Ubuntu/Fedora / Debian / Mint OS) / Windows Turbo C Version 3 or GCC Version Unit III UNIT III4/ Built in Linux /DEVC++ Front End: NetBeans Back End: Oracle 9i/ PL SQL / Hadoop / Weka

SEMESTER VIII

Course Code	Course Title	L	T		P	C
THEORY						
	Elective V	3	0		0	3
	Elective VI	3	0		0	3
PRACTICAL						
01UIT803	Project Work	0	0		12	6
	TOTAL	6	0		12	12
Total No. of Credits - 12						

01UIT803	PROJECT WORK	L	T	P	C
		0	0	12	6

OBJECTIVE

- To deepen comprehension of principles by applying them to a new problem which may be the design and manufacture of a device, a research investigation, a computer based project or management project.

PROJECT DESCRIPTION :

Six periods per week shall be allotted in the time table and this time shall be utilized by the students to receive the directions from the guide, on library reading, laboratory work, computer analysis or field work as assigned by the guide and also to present in periodical seminars on the progress made in the project. The progress of the project is evaluated based on a minimum of three reviews.

COURSE OUTCOMES

- Design/Develop sustainable solutions for societal issues with environmental considerations applying the basic engineering knowledge
- Analyze and review research literature to synthesize research methods including design of experiments to provide valid conclusion
- Utilize the new tools, algorithms, techniques to provide valid conclusion following the norms of engineering practice
- Test and Evaluate the performance of the developed solution using appropriate techniques and tools
- Apply management principles to function effectively in the project team for project execution
- Engage in learning for effective project implementation in the broadest context of technological change with consideration for public health, safety, cultural and societal needs
- Write effective reports and make clear presentation to the engineering community and society

ELECTIVES

LIST OF ELECTIVES

Course Code	Course Title	L	T	P	C
01UIT901	Distributed Operating Systems	3	0	0	3
01UIT902	Modern Artificial Intelligence	3	0	0	3
01UIT903	Software Architecture	3	0	0	3
01UIT904	Agile Software Development	3	0	0	3
01UIT905	Intrusion Detection System	3	0	0	3
01UIT906	User Interface Framework Development	3	0	0	3
01UIT907	Management Information Systems	3	0	0	3
01UIT908	Grid and Cloud Computing	3	0	0	3
01UIT909	Data Analytics	3	0	0	3
01UIT910	Building Enterprise Applications	3	0	0	3
01UIT911	Adhoc and Sensor Networks	3	0	0	3
01UIT912	Principles of Software Testing	3	0	0	3
01UIT913	Intelligent Agents	3	0	0	3
01UIT914	System Software Internals	3	0	0	3
01UIT915	Bio Informatics	3	0	0	3
01UIT916	Digital Asset Management	3	0	0	3
01UIT917	Communication Protocols	3	0	0	3
01UIT918	FOSS for Enterprise Applications	3	0	0	3
01UIT919	Social Network Analysis	3	0	0	3
01UIT920	Ethical Hacking and Information Forensics	3	0	0	3
01UIT921	Data Mining Concepts and Techniques	3	0	0	3
01UIT922	Satellite Communication and Broadcasting	3	0	0	3
01UCS902	Information Storage Management	3	0	0	3
01UEC953	Coding and Information Theory	3	0	0	3

Note: Student may choose any one of the electives offered by the other branch of study.

01UIT901	DISTRIBUTED OPERATING SYSTEMS	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To explain the hardware and software features that support distributed OS
- To import a broader sense of knowledge in multi-threading operating system and memory concepts
- To demonstrate some insight in to the design of ATM networks and client server model

UNIT I INTRODUCTION TO DISTRIBUTED SYSTEMS 9

Distributed system goals, Hardware Concepts, Software concepts, design issues, Case study: Unix

UNIT II COMMUNICATION IN DISTRIBUTED SYSTEMS 9

Layered Protocol, ATM Networks, client server model - remote procedure call – group communication, Case study: SUN RPC, DCE, RPC.

UNIT III SYNCHRONIZATION 9

Clock synchronization - mutual exclusion - election atomic transactions - dead locks, Case study: CHORUS

UNIT IV PROCESS AND PROCESSORS DISTRIBUTED FILE SYSTEMS 9

Threads - System models processor allocation - scheduling fault tolerance - real time distributed systems. File system design and implementation - trends in distributed file systems

UNIT V SHARED MEMORY 9

Introduction - bus based multi processors, ring based multiprocessors ,switched multiprocessors - NUMA comparison of shared memory systems - consistency models - page based distributed shared memory - shared variable distributed shared memory - object based distributed shared memory

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Explain the issues in designing distributed operating systems.
- Discuss various networking and communication technologies
- List the synchronization problems in distributed systems
- Implement the real time shared memory systems.

TEXT BOOKS:

1. Pradeep K.Sinha," Distributed operating systems: concepts and design", PHI,2008.
2. George Coulouris,Jean Dollimore, Tim Kindberg, "Distributed Systems, Concepts and Design", Addison Wesley, Fifth Edition, May 2011.

REFERENCE BOOKS:

1. Doreen L. Galli, “Distributed operating systems: concepts and practice”, Prentice Hall, 2000.
2. Andrew S.Tanenbaum, Marteen Van Steen, “Distributed Systems Principles And Paradigms”, Pearson Edition, 2007.
3. M.L.Liu, “Distributed Computing Principles and Applications”, Pearson Addison Wesley, 2004.
4. MukeshSinghal, “Advanced Concepts In Operating Systems”, McGraw-Hill Series in Computer Science, 1994

01UIT902	MODERN ARTIFICIAL INTELLIGENCE	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To Introduce the basic concepts of artificial intelligence
- To explain various knowledge representation techniques.
- To import the various knowledge inference, machine learning approaches and problem solving techniques

UNIT I INTRODUCTION TO AI AND PRODUCTION SYSTEMS 9

Introduction to AI-Problem formulation, Problem Definition -Production systems, Control strategies, Search strategies. Problem characteristics, Production system characteristics -Specialized production system- Problem solving methods - Problem graphs, Matching, Indexing and Heuristic functions -Hill Climbing-Depth first and Breath first, Constraints satisfaction - Related algorithms, Measure of performance and analysis of search algorithms.

UNIT II REPRESENTATION OF KNOWLEDGE 9

Game playing - Knowledge representation, Knowledge representation using Predicate logic, Introduction to predicate calculus, Resolution, Use of predicate calculus, Knowledge representation using other logic-Structured representation of knowledge.

UNIT III KNOWLEDGE INFERENCE 9

Knowledge representation -Production based system, Frame based system. Inference - Backward chaining, Forward chaining, Rule value approach, Fuzzy reasoning - Certainty factors, Bayesian Theory-Bayesian Network-Dempster - Shafer theory.

UNIT IV PLANNING AND MACHINE LEARNING 9

Basic plan generation systems - Strips -Advanced plan generation systems – K strips -Strategic explanations -Why, Why not and how explanations. Learning- Machine learning, adaptive Learning

UNIT V COMMUNICATION, PERCEPTION AND ACTION 9

Communication: Communication as action – A Formal Grammar fora Fragment of English – Syntactic Analysis – Augmented Grammars– Semantic Representation – Ambiguity and Disambiguation –Perception: Introduction – Image formation – Extracting Three-Dimensional information – Object Recognition – Robotics: Hardware – Perception – Planning – Moving – Software Architectures

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Identify problems that are amenable to solution by AI methods
- Apply predicate logic for knowledge representation
- Identify appropriate AI methods to solve a given problem
- Design and carry out an empirical evaluation of different AI algorithms

TEXT BOOKS:

1. Kevin Night and Elaine Rich, Nair B., “Artificial Intelligence (SIE)”, McGrawHill-2008. (Unit-1,2,4,5).
2. Dan W. Patterson, “Introduction to AI and ES”, Pearson Education, 2007. (Unit-III)

REFERENCE BOOKS:

1. Peter Jackson, “Introduction to Expert Systems”, 3rd Edition, Pearson Education, 2007.
2. Stuart Russel and Peter Norvig “AI – A Modern Approach”, 2nd Edition, Pearson Education 2007.
3. Deepak Khemani “Artificial Intelligence”, Tata McGraw Hill Education 2013.
4. Stuart Russell, Peter Norvig, Artificial Intelligence – A Modern Approach, Pearson Education Prentice Hall of India , 2nd Edition,2005

01UIT903	SOFTWARE ARCHITECTURE	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To explain the requirements of software architectures
- To describe various architectural styles and views
- To introduce the quality attributes of software architectures

UNIT I INTRODUCTION AND ARCHITECTURAL DRIVERS 9

Introduction– What is software architecture?–Standard Definitions–Architectural structures– Influence of software architecture on organization-both business and technical – Architecture Business Cycle-Introduction–Functional requirements–Technical constraints–Quality Attributes.

UNIT II QUALITY ATTRIBUTE WORKSHOP 9

Quality Attribute Workshop–Documenting Quality Attributes –Six part scenarios–Case studies

UNIT III ARCHITECTURAL VIEWS 9

Introduction–Standard Definitions for views–Structures and views-Representing views-available notations–Standard views–4+1 view of RUP, Siemens 4 views, SEI's perspectives and views– Case studies

UNIT IV ARCHITECTURAL STYLES 9

Introduction–Data flow styles–Call-return styles–Shared Information styles-Event styles–Case studies for each style.

UNIT V DOCUMENTING THE ARCHITECTURE 9

Good practices–Documenting the Views using UML–Merits and Demerits of using visual languages – Need for formal languages - Architectural Description Languages – ACME – Case studies. Special topics: SOA and Web services–Cloud Computing–Adaptive structures

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Explain the basic architectural requirements and influence of architecture on business and technical activities
- Choose the appropriate quality attributes and its scenarios
- Identify the standard architectural views
- Categorize various architectural styles
- Adapt good practices for documenting the architecture and Describe the recent trends in software architecture

TEXT BOOKS:

1. Len Bass, Paul Clements, and Rick Kazman," Software Architectures Principles and Practices", Addison-Wesley, 2nd Edition, 2003.
2. Anthony J Lattanze, "Architecting Software Intensive System. A Practitioner's Guide", Auerbach Publications, 2010.

REFERENCE BOOKS:

1. Paul Clements, Felix Bachmann, Len Bass, David Garlan, JamesIvers, Reed Little, Paulo Merson, Robert Nord, and Judith Stafford, “Documenting Software Architectures. Views and Beyond”,2nd Edition, Addison-Wesley,2010.
2. Paul Clements, Rick Kazman, and Mark Klein, “Evaluating software architectures: Methods and case studies.Addison-Wesley,2001.
3. Rajkumar Buyya, James Broberg, and Andrzej Goscinski, “Cloud Computing. Principles and Paradigms”, John Wiley & Sons, 2011
4. Mark Hansen, “SOA Using Java Web Services”, Prentice Hall,2007.

01UIT904	AGILE SOFTWARE DEVELOPMENT	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To learn how to immediately start producing software incrementally regardless of existing engineering practices or methodologies
- To learn how to simplify the implementation of Agile processes
- To learn how to simplify XP implementation through a Scrum wrapper
- To learn why Agile processes work and how to manage them
- To understand the theoretical underpinnings of Agile processes

UNIT I FUNDAMENTALS OF AGILE 9

The Genesis of Agile, Introduction and background, Agile Manifesto and Principles, Overview of Scrum, Extreme Programming, Feature Driven development, Lean Software Development, Agile project management, Design and development practices in Agile projects, Test Driven Development, Continuous Integration, Refactoring, Pair Programming, Simple Design, User Stories, Agile Testing, Agile Tools.

UNIT II AGILE SCRUM FRAMEWORK 9

Introduction to Scrum, Project phases, Agile Estimation, Planning game, Product backlog, Sprint backlog, Iteration planning, User story definition, Characteristics and content of user stories, Acceptance tests and Verifying stories, Project velocity, Burn down chart, Sprint planning and retrospective, Daily scrum, Scrum roles – Product Owner, Scrum Master, Scrum Team, Scrum case study, Tools for Agile project management

UNIT III AGILE TESTING 9

The Agile lifecycle and its impact on testing, Test-Driven Development (TDD), xUnit framework and tools for TDD, Testing user stories - acceptance tests and scenarios, Planning and managing testing cycle, Exploratory testing, Risk based testing, Regression tests, Test Automation, Tools to support the Agile tester

UNIT IV AGILE SOFTWARE DESIGN AND DEVELOPMENT 9

Agile design practices, Role of design Principles including Single Responsibility Principle, Open Closed Principle, Liskov Substitution Principle, Interface Segregation Principles, Dependency Inversion Principle in Agile Design, Need and significance of Refactoring, Refactoring Techniques, Continuous Integration, Automated build tools, Version control

UNIT V INDUSTRY TRENDS 9

Market scenario and adoption of Agile, Agile ALM, Roles in an Agile project, Agile applicability, Agile in Distributed teams, Business benefits, Challenges in Agile, Risks and Mitigation, Agile projects on Cloud, Balancing Agility with Discipline, Agile rapid development technologies

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Discuss the basic concepts of organizational management
- Explain various organization structures and standards
- Understand the need for motivation, control and coordination in an organizational structure.
- Implement managerial functions with modern comprehensive management tools.

TEXT BOOKS:

1. Ken Schawber, Mike Beedle, ” Agile Software Development with Scrum ”, Pearson , 2002.
2. Robert C. Martin , Micha Martin, ” Agile Software Development, Principles, Patterns and Practices ”, Pearson, , 2007

REFERENCE BOOKS:

1. Lisa Crispin, Janet Gregory,” Agile Testing: A Practical Guide for Testers and Agile Teams”, Addison Wesley, 2008.
2. Alistair Cockburn, ” Agile Software Development: The Cooperative Game ”, Addison Wesley, 2006
3. Mike Cohn, ” User Stories Applied: For Agile Software”, Addison Wesley , 1st Edition
4. http://martinfowler.com/agile.html
5. www.it-ebooks.info/tag/agile

01UIT905	INTRUSION DETECTION SYSTEM	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To introduce the fundamentals of Intrusion Detection in order to avoid common pitfalls.
- To explain intrusion detection alerts and logs to distinguish attack types from false alarms.
- To import Intrusion Detection tools and techniques in order to improve the security posture of an enterprise.

UNIT I INTRODUCTION **9**

Understanding Intrusion Detection – Intrusion detection and prevention basics – IDS and IPS analysis schemes, Attacks, Detection approaches –Misuse detection – anamoly detection – specification based detection – hybrid detection

UNIT II THEORETICAL FOUNDATIONS OF DETECTION **9**

Taxonomy of anomaly detection system – fuzzy logic – Bayes theory – Artificial Neural networks – Support vector machine – Evolutionary computation – Association rules – Clustering

UNIT III ARCHITECTURE AND IMPLEMENTATION **9**

Centralized – Distributed – Cooperative Intrusion Detection - Tiered architecture

UNIT IV JUSTIFYING INTRUSION DETECTION AND ORGANIZATIONS STANDARDS **9**

Intrusion detection in security – Threat Briefing – Quantifying risk – Return on Investment (ROI) - Law Enforcement / Criminal Prosecutions – Standard of Due Care – Evidentiary Issues, Organizations and Standardizations.

UNIT V APPLICATIONS AND TOOLS **9**

Tool Selection and Acquisition Process - Bro Intrusion Detection – Prelude Intrusion Detection - Cisco Security IDS - Snorts Intrusion Detection – NFR security.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Compare various types of intrusion detections and techniques.
- Adapt different architectures and implementation.
- Originate security policies and organization standards.
- Discuss various intrusion detection tools.

TEXT BOOKS:

1. Ali A. Ghorbani, Wei Lu, ”Network Intrusion Detection and Prevention: Concepts and Techniques”, Springer, 2010..
2. Carl Enrolf, Eugene Schultz, Jim Mellander, ”Intrusion detection and Prevention”, McGraw Hill, 2004.

REFERENCE BOOKS:

1. Paul E. Proctor, “The Practical Intrusion Detection Handbook”, Prentice Hall, 2001.
2. AnkitFadia, MnuZacharia, “Intrusion Alert”, Vikas Publishing house Pvt Ltd., 2007.
3. Earl Carter, Jonathan Hogue, “Intrusion Prevention Fundamentals”, Pearson Education, 2006.
4. Robert.L. Barnard, “Intrusion detection System”, gulf professional publishing,1998.

01UIT906	USER INTERFACE FRAMEWORK DEVELOPMENT	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To explain the characteristics and components of windows
- To familiarize various controls for the windows
- To summarize the various problem in windows design with color, text, graphics and testing methods

UNIT I INTRODUCTION **8**

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

UNIT II HUMAN COMPUTER INTERACTION **10**

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

UNIT III WINDOWS **9**

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

UNIT IV MULTIMEDIA **9**

Text For Web Pages – Effective Feedback– Guidance & Assistance– Internationalization– Accessibility– Icons– Image– Multimedia – Coloring.

UNIT V WINDOWS LAYOUT– TEST **9**

Prototypes – Kinds Of Tests – Retest – Information Search – Visualization – Hypermedia – WWW– Software Tools.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Apply the knowledge of user interfaces and design principles to design any web application
- Design the interfaces using system components, HCI concepts and principles that meet with realistic constraints
- Apply the knowledge of window characteristics to develop any applications.
- Conduct investigations on different applications with modern IT tools to assess the user interface design
- Apply the knowledge of different testing techniques to identify the problem in web designs

TEXT BOOKS:

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

REFERENCE BOOKS:

1. Alan Cooper, “The Essential Of User Interface Design”, Wiley – Dream Tech Ltd.,2002.
2. Debbie Stone, Caroline Jarrett, Mark Woodroffe, Shailey Minocha, “User Interface Design and Evaluation (Interactive Technologies)”, Morgan-Kaufmann Publishers,2005.
3. Ronald M. Baecker, Jonathan Grudin, William A. S. Buxton & Saul Greenberg (Editors),” Readings in Human-Computer Interaction” , Morgan-Kaufmann Publishers,2nd Edition,1995.
4. Ben Shneiderman and Catherine Plaisant, “Designing the User Interface: Strategies for Effective Human-Computer Interaction”, Addison-Wesley Publishing Co,5th Edition, 2009.

01UIT907	MANAGEMENT INFORMATION SYSTEMS	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To review the fundamentals of Information Systems
- To demonstrate the knowledge through system structure
- To import the knowledge involved in Decision Making Process

UNIT I INFORMATION SYSTEM AND ORGANIZATION 9

Matching the Information System Plan to the Organizational Strategic Plan – Identifying Key Organizational objectives and Processes and Developing an Information System Development –User role in Systems Development Process – Maintainability and Recoverability in System Design.

UNIT II REPRESENTATION AND ANALYSIS OF SYSTEM STRUCTURE 9

Models for Representing Systems: Mathematical, Graphical and Hierarchical (Organization Chart, Tree Diagram) – Information Flow – Process Flow – Methods and Heuristics – Decomposition and Aggregation – Information Architecture – Application of System Representation to Case Studies.

UNIT III SYSTEMS, INFORMATION AND DECISION THEORY 9

Information Theory – Information Content and Redundancy – Classification and Compression – Summarizing and Filtering – Inferences and Uncertainty – Identifying Information needed to Support Decision Making – Human Factors – Problem characteristics and Information System Capabilities in Decision Making.

UNIT IV INFORMATION SYSTEM APPLICATION 9

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

UNIT V DEVELOPMENT AND MAINTENANCE OF INFORMATION SYSTEMS 9

Systems analysis and design – System development life cycle – Limitation – End User Development – Managing End Users – off– the shelf software packages – Outsourcing Comparison of different methodologies.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Understand the concept of information systems for various organization
- Apply the appropriate problem solving techniques for business frameworks
- Understand the decision theory related to information systems
- Recognize the need for information Technology tools
- Select and apply appropriate techniques, resources and modern IT tools to complex engineering activities

TEXT BOOKS:

1. Laudon K.C, Laudon J.P, Brabston M.E, “Management Information Systems - Managing the digital firm”, Pearson Education, 2004.
2. Gabriele Piccoli,“Information Systems – for managers”, Wiley, 2008.

REFERENCE BOOKS:

1. Turban E.F, Potter R.E, “Introduction to Information Technology”, Wiley, 2004.
2. Jeffrey A.Hoffer, Joey F.George, Joseph S. Valachich, “Modern Systems Analysis and Design”, Third Edition, Prentice Hall, 2002.
3. David Kroenke, ” Using MIS ”, Pearson Prentice Hall, ,2007.
4. Koontz &Weirich,” Essentials of Management”, Tata McGraw Hill Publishing Company, New Delhi,2003

01UIT908	GRID AND CLOUD COMPUTING	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To emphasize the need for Grid computing in solving large scale problems
- To explain grid computing infrastructures and cloud services
- To introduce programming models and security issues in the grid and cloud environment

UNIT I INTRODUCTION **9**

Evolution of Distributed computing: Scalable computing over the Internet–Technologies for network based systems– clusters of cooperative computers -Grid computing Infrastructures– cloud computing - service oriented architecture – Introduction to Grid Architecture and standards – Elements of Grid–Overview of Grid Architecture

UNIT II GRID SERVICES **9**

Introduction to Open Grid Services Architecture (OGSA)–Motivation–Functionality Requirements– Practical & Detailed view of OGSA/OGSI–Data intensive grid service models–OGSA services.

UNIT III VIRTUALIZATION **9**

Cloud deployment models: public, Private, Hybrid, community– Categories of cloud computing: Everything as a service: Infrastructure, platform, software-Pros and Cons of cloud computing– Implementation levels of virtualization–virtualization structure–virtualization of CPU, Memory and I/O devices– virtual clusters and Resource Management–Virtualization for data center automation.

UNIT IV PROGRAMMING MODEL **9**

Open source grid middle ware packages–Globus Toolkit(GT4) Architecture, Configuration–Usage of Globus–Main components and Programming model-Introduction to Hadoop Framework –Map reduce, Input splitting, map and reduce functions, specifying input and output parameters, configuring and running a job–Design of Hadoop file system, HDFS concepts, command line and java interface, data flow of File read & File write.

UNIT V SECURITY **9**

Trust models for Grid security environment – Authentication and Authorization methods – Grid security infrastructure–Cloud Infrastructure security: network, host and application level–aspects of data security, provider data and its security, Identity and access management architecture, IAM practices in the cloud, SaaS, PaaS, IaaS availability in the cloud, Key privacy issues in the cloud.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Understand the role of grid computing techniques to solve large scale problems
- Apply the virtualization concepts
- Demonstrate various grid and cloud tool kits
- Exhibit knowledge on security models in the grid and cloud environment

TEXT BOOKS:

1. Frederic Magoules, JiePan, “Introduction to Grid Computing”, CRC Press,2009.
2. Kai Hwang, Geoffery C.Fox and Jack J.Dongarra,“Distributed and Cloud Computing: Clusters, Grids, Clouds and the Future of Internet”, First Edition, Morgan Kaufman Publisher, anImprint of Elsevier,2012.

REFERENCE BOOKS:

1. Jason Venner, “Pro Hadoop-Build Scalable, Distributed Applications in the Cloud”, A Press, 2009.
2. Tom White, “Hadoop The Definitive Guide”, First Edition. O" Reilly,2009.
3. Bart Jacob (Editor), “Introduction to Grid Computing”, IBM Red Books, Vervante, 2005
4. Ian Foster, Carl Kesselman, “The Grid: Blue print for a New Computing Infrastructure”, 2nd Edition, Morgan Kaufmann.

01UIT909	DATA ANALYTICS	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To introduce the fundamental concepts of big data analytics
- To explain big data analysis using intelligent techniques
- To familiarize the various search methods, clustering techniques and frameworks and visualization approaches

UNIT I INTRODUCTION TO BIGDATA 9

Introduction to Big Data Platform–Challenges of conventional systems-Web data–Evolution of Analytic scalability, analytic processes and tools, Analysis vs reporting- Modern data analytic tools, Statistical concepts: Sampling distributions, resampling, statistical inference, prediction error.

UNIT II DATA ANALYSIS 9

Regression modeling, Multivariate analysis, Bayesian modeling, Inference and Bayesian networks, and Support vector and kernel methods, Analysis of time series: linear systems analysis, nonlinear dynamics-Rule induction-Neural networks: learning and generalization, competitive learning, principal component analysis and neural networks; Fuzzy logic: extracting fuzzy models from data, fuzzy decision trees, and Stochastic search methods.

UNIT III MINING DATA STREAMS 9

Introduction to Streams Concepts–Stream data model and architecture-Stream Computing, Sampling data in a stream–Filtering streams– Counting distinct elements in a stream–Estimating moments–Counting oneness in a window –Decaying window –Real time Analytics Platform(RTAP) applications-case studies - real time sentiment analysis, stock market predictions.

UNIT IV FREQUENT ITEM SETS AND CLUSTERING 9

Mining Frequent item sets- Market based model–Apriori Algorithm–Handling large data sets in Main memory –Limited Pass algorithm–Counting frequent item sets in a stream–Clustering Techniques–Hierarchical–K-Means–Clustering high dimensional data–CLIQUE and PROCLUS–Frequent pattern based clustering methods–Clustering in non-euclidean space–Clustering for streams and Parallelism.

UNIT V FRAMEWORKS AND VISUALIZATION 9

Map Reduce– Hadoop, Hive, MapR–Sharding– No SQLDatabases-S3 –Hadoop Distributed file systems–Visualizations-Visual data analysis techniques, Interaction techniques; Systems and applications

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Comprehend the statistical analysis methods in handling big data
- Identify appropriate soft computing frameworks in real-time mining
- Apply stream data mining
- Develop searching and clustering techniques to large datasets
- Demonstrate knowledge in visualization techniques

TEXT BOOKS:

1. Michael Berthold, David J.Hand, “Intelligent Data Analysis”, Springer, 2007.
2. Anand Rajaraman and, Jeffrey David Ullman, ”Mining of Massive Datasets”, Cambridge University Press, 2012.

REFERENCE BOOKS:

1. Bill Franks, ”Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with advanced analystics”, John Wiley & sons, 2012.
2. Glenn J.Myatt,” Making Sense of Data”, John Wiley & Sons, 2007.
3. Jiawei Han, Micheline Kamber,”Data Mining Concepts and Techniques”, Elsevier, Second Edition, Reprinted2008.
4. Tom White, ”Hadoop: The Definitive Guide”, O"reilly Media, Third Edition, 2012.

01UIT910	BULIDING ENTERPRISE APPLICATIONS	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To familiarize functional / nonfunctional requirements, business scenario and document the use case diagrams in the given template
- To demonstrate logical architecture for the given business scenario documented in use case diagrams
- To import data architecture for the given logical architecture

UNIT I INTRODUCTION **8**

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

UNIT II DESIGN PHASE **9**

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

UNIT III ARCHITECTURE DESIGN **10**

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

UNIT IV IMPLEMENTATION METHODOLOGIES **9**

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

UNIT V VALIDATION **9**

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

TOTAL: 45 PERIODS

COURSE OUTCOMES:

- List the skills required to built the enterprise application
- Estimate the requirement for business model
- Design architecture and networking model for an application
- Construct and develop different solution layers
- Build a suitable test case for an application

TEXT BOOKS:

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

REFERENCE BOOKS:

1. Soren Lauesen, "Software Requirements: Styles & Techniques", Addison-Wesley Professional, 2002.
2. Brian Berenbach, "Software Systems Requirements Engineering: In Practice", McGraw-Hill/Osborne Media, 2009.
3. Dean Leffingwell, Don Widrig, "Managing Software Requirements: A Use Case Approach", Pearson Education, 2003
4. Vasudeva Varma, Varma Vasudeva, "Software Architecture: A Case Based Approach", Pearson.

01UIT911	ADHOC AND SENSOR NETWORKS	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To explain mobile adhoc networks, design, implementation issues, routing and clustering mechanism
- To import the 802.11 Wireless Lan (WiFi) and Bluetooth standards
- To demonstrate designing and implementing adhoc network functionality using network simulation tools and Pocket PCs

UNIT I ROUTING **9**

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

UNIT II QUALITY OF SERVICE **9**

Real-time traffic support – Issues and challenges in providing QoS – Classification of QoS Solutions – MAC layer classifications – QoS Aware Routing Protocols Ticket based and Predictive location based Qos Routing Protocols.

UNIT III ENERGY MANAGEMENT ADHOC NETWORKS **9**

Need for Energy Management – Classification of Energy Management Schemes – Battery Management and Transmission Power Management Schemes – Network Layer and Data Link Layer Solutions – System power Management schemes

UNIT IV MESH NETWORKS **9**

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

UNIT V SENSOR NETWORKS **9**

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

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Discuss the routing mechanism and solutions for quality of service.
- Compare the schemes for energy management of ad hoc networks
- Explain different types Mesh Networks for various applications
- Choose information and dissemination protocols for real time sensor networks

TEXT BOOKS:

1. C. Siva Ram Murthy and, B.S.Manoj, “Adhoc Wireless Networks Architectures and Protocols”, Pearson Education, 2004.
2. Carlos de Morais Cordeiro, Dharma Prakash Agrawal, Adhoc and Sensor Networks Theory and Applications”, World Scientific Publishing Co Pvt Ltd, 2006.

REFERENCE BOOKS:

1. Feng Zhao, Leonidas Guibas,”Wireless Sensor Networks, Morgan”, Kaufman Publishers, 2004.
2. C.K.Toh, “Adhoc Mobile Wireless Networks”, Pearson Education, 2002.
3. Thomas Krag an, Sebast in Buettrich, “Wireless Mesh Networking”, OReilly.
4. Prasant Mohapatra, and Srihanamurthy”,Ad Hoc Networks Technologies and Protocols”, Springer,InternationalEdition,2009.

01UIT912	PRINCIPLES OF SOFTWARE TESTING	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To introduce software testing principles
- To import knowledge on various software testing and test case design strategies
- To summarize test planning, monitoring and controlling approaches using testing tools

UNIT I INTRODUCTION **9**

Testing as an Engineering Activity – Testing as a Process – Testing axioms – Basic definitions – Software Testing Principles – The Tester"s Role in a Software Development Organization – Origins of Defects – Cost of defects – Defect Classes – The Defect Repository and Test Design – Defect Examples – Developer/Tester Support of Developing a Defect Repository – Defect Prevention strategies.

UNIT II TEST CASE DESIGN **9**

Test case Design Strategies – Using Black Bod Approach to Test Case Design – Random Testing – Requirements based testing – Boundary Value Analysis – Equivalence Class Partitioning – State-based testing – Cause-effect graphing – Compatibility testing – user documentation testing – domain testing – Using White Box Approach to Test design – Test Adequacy Criteria – static testing vs. structural testing – code functional testing – Coverage and Control Flow Graphs – Covering Code Logic – Paths – code complexity testing – Evaluating Test Adequacy Criteria

UNIT III LEVELS OF TESTING **9**

The need for Levers of Testing – Unit Test – Unit Test Planning – Designing the Unit Tests – The Test Harness – Running the Unit tests and Recording results – Integration tests – Designing Integration Tests – Integration Test Planning – Scenario testing – Defect bash elimination System Testing – Acceptance testing – Performance testing – Regression Testing – Internationalization testing – Ad- hoc testing – Alpha, Beta Tests – Testing OO systems – Usability and Accessibility testing – Configuration testing – Compatibility testing – Testing the documentation – Website testing

UNIT IV TEST AMANAGEMENT **9**

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

UNIT V TEST AUTOMATION **9**

Software test automation – skill needed for automation – scope of automation – design and architecture for automation – requirements for a test tool – challenges in automation – Test metrics and measurements – project, progress and productivity metrics, Methodology to evaluate automated testing tools, Load Runner, Win runner and Rational Testing Tools, JMetra, JUNIT and Cactus.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Apply the software testing principles and its defects
- Develop test cases to exercise a software
- Design and conduct various types and levels of software testing for a software project
- Apply various testing techniques, including domain, code, fault, usage and model based for real time applications
- Make use of Automated testing tools for software project

TEXT BOOKS:

1. SrinivasanDesikan and Gopalaswamy Ramesh, “Software Testing – Principles and Practices”, Pearson Education, 2006.
2. Ron Patton, “Software Testing”, Second Edition, Sams Publishing, Pearson Education, 2007.

REFERENCE BOOKS:

1. Ilene Burnstein,” Practical Software Testing”, Springer International Edition, 2003.
2. Edward Kit,” Software Testing in the Real World – Improving the Process”, Pearson Education, 1995.
3. Boris Beizer,” Software Testing Techniques” – 2nd Edition, Van Nostrand Reinhold, New York, 1990.
4. Aditya P. Mathur, “Foundations of Software Testing _ Fundamental Algorithms and Techniques”, Dorling Kindersley (India) Pvt. Ltd., Pearson Education, 2008.

01UIT913	INTELLIGENT AGENTS	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To introduce the basic concepts of software agents and its characteristics
- To import the significance of agent classifications, models / architectures and the methods used for communication
- To review avenues of Intelligent agent based applications

UNIT I INTRODUCTION 8

Agents as tools of the Information Society – Intelligent Software Agents – Agents in Business Area – Agents in Private Area – Definition of Intelligent Software Agents – Characteristics

UNIT II AGENT CLASSIFICATION 9

Agent Classification - Areas of Influence – Artificial Intelligence – Distributed AI –Network Communication System – Architecture –Deliberative and Reactive Agents – Stationary and Mobile Agents – RPC – Remote Programming – Advantage and Disadvantage of Mobile Agents

UNIT III AGENT MODELING 10

Technical Implementations – Software Architecture of Mobile Agent System – Layers of base software for mobile agents – functions of agent layer – communication flow between agent and agent layer – Mullers Agent Architecture – Brooks Subsumption Architecture - Conceptual Interrap Agent Model – Interrap Agent Architecture – Agent Learning models Architecture

UNIT IV AGENT COMMUNICATION 8

Multi-Agent Systems - Communication and Cooperation in Multi-Agent Systems – Distributed Problem Solving – Communication Methods – Black board Systems – Extended Black Board Structure- Message passing – Cooperation Protocols

UNIT V APPLICATIONS OF AGENTS 10

Development methods and Tools – Agent Oriented Analysis and Design – Object Oriented Analysis – Agent Oriented Methods – Agent Languages – Applications areas for software Intelligent Agents – Information Retrieval and Filtering – News Watcher – Entertainment – Agent based applications on Data Mining, Image Processing and Wireless Sensor Networks.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Classify the agents according to their characteristics and functionalities.
- Build a Multi-Agent Architecture for an application.
- Illustrate various Agent Communication Protocols.
- Construct Agent Based applications.

TEXT BOOKS:

1. Walter Brenner, Rudiger Zarnekow, Hartmut Wittig Claudia Schubert, Intelligent Software Agents Foundations and Applications ,Springer, 1998
2. Jacques Ferber, Multi-Agent System: An Introduction to Distributed Artificial Intelligence, Addison Wesley, 1999.

REFERENCE BOOKS:

1. Jeffrey M. Bradshaw, Software Agents, Copyright ©American Association of Artificial Intelligence AAAI Press the MIT press, 1997.
2. Lin Padgham and Michael Winikoff , Developing Intelligent Agent Systems A Practical Guide, John Wiley and Sons, 2004
3. AlperCaglayan, Colin Harrison, Agent Source Book [Paperback], Wiley, Joseph P Bigus, Jennifer Bigus, Constructing Intelligent Agents with Java A Programmers Guide to Smarter Applications , Paperback, Wiley computer publishing, 1997.
4. Kerstin Dautenhahn, Alan H.Bond, Lola Canamero, Bruce Edmonds, “Socially Intelligent Agents Creating Relationships with computers and Robots”, Kluwer Academic Publisher, 2002.

01UIT914	SYSTEM SOFTWARE INTERNALS	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To explain the relationship between system software and machine architecture
- To demonstrate the design and implementation of assemblers, linkers and loaders
- To familiarize the macro processors and system software tools

UNIT I INTRODUCTION **9**

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

UNIT II ASSEMBLERS **9**

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.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Understand the Architecture of SIC Machine
- Discuss Assembler, Loader and their design aspects
- Explain Macro Processors Functions and Design Options
- Develop Application using System Software Tools

TEXT BOOKS:

1. Leland L. Beck," System Software – An Introduction to Systems Programming", Pearson Education Asia, 3rd Edition, 2000.
2. D. M. Dhamdhere,"Systems Programming and Operating Systems", Tata McGraw-Hill, Second Revised Edition, 1999.

REFERENCE BOOKS:

1. John J. Donovan, "Systems Programming", Tata McGraw-Hill Edition, 1972...
2. John R. Levine, "Linkers & Loaders", Morgan Kaufmann Publishers, Harcourt India Pvt. Ltd, 2000..
3. Santanu Chattopadhyay,"System Software", Phi Learning, 2008.
4. A.J.Cole, "Macro Processors", Cambridge University, 2nd Edition, 1981.

01UIT915	BIO INFORMATICS	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To demonstrate the computational aspects and soft computing approaches in biotechnology
- To explain the evolution of life
- To familiarize the advancements in biotechnology

UNIT I INTRODUCTION **9**

Basic UNIX commands – telnet – ftp – protocols – hardware – topology -search engines – search algorithms – Perl programming.

UNIT II DATABASES **9**

Data management – data life cycle – database technology – interfaces and implementation – biological databases and their uses

UNIT III PATTERN MATCHING & MACHINE LEANING **9**

Pairwise sequence alignment – local vs. global alignment – multiple sequence alignment – dot matrix analysis – substitution matrices – dynamic programming – Bayesian methods – tools – BLAST – FASTA- machine learning – neural networks – statistical methods – Hidden Markov models – Homology Modeling.

UNIT IV PHYLOGENY **9**

Introduction; mutations; irrelevant mutations; controls; mutations as asure of time; distances; reconstruction; distances between species; estimating tervals from distances

UNIT V ADVANCED TOPICS IN BIOINFORMATICS **9**

Biomolecular and cellular computing – micro array analysis – systems biology.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Express modern biology and its relationship with informatics
- Discuss various DB technology with respect to bioinformatics
- Describe Bioinformatics Algorithms and utilize its tools
- Develop Biomolecular and cellular computing applications

TEXT BOOKS:

1. B. Bergeron," Bioinformatics Computing", PHI, 2002.
2. Westhead, D.R, Parish, J.H, Twyman, R.M.,, "Instant Notes In Bioinformatics BIOS Scientific Publishers, ", 2000

REFERENCE BOOKS:

1. C. Gibas, P. Jambeck,"Developing Bioinformatics Skills", O'Reilly, 1999.
2. HoomanRashidi, Lukas K. Buehler, "Bioinformatics Basics: Applications in Biological Science and Medicine", CRC Press/Taylor & Francis Group, 2nd edition, May 2005
3. Stephen A. Krawetz, David D. Womble, "Introduction to Bioinformatics: A Theoretical and Practical Approach", Humana Press, 1st, Book & CD-ROM edition, May 2003.
4. Bryan Bergeron , "Bioinformatics Computing", Prentice Hall PTR, 1st edition, November 2002.

01UIT916	DIGITAL ASSET MANAGEMENT	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To explain the ways and means of creating and storing digital content
- To demonstrate the basics of content management and design issues
- To familiarize the key technologies to build content management systems.

UNIT I CREATING DIGITAL CONTENT **8**

Digital Primer, Any Content – Anywhere, Anytime, Digital Content Consumer, Tools and the Trade, Digital Recording, CGI and Digital Content Creation, Digital Audio, Rich Media, Streaming Media, Digital Interactive Television, Digital Cinema

UNIT II COMPRESSING AND INDEXING **9**

Document Databases –Compression -Indexes-Text Compression Indexing Techniques–Image Compression-Mixed Text and Images.

UNIT III CONTENT MANAGEMENT **10**

Systems for Managing Content –The Enterprise Content Management System (CMS) –Major parts of a CMS —Need for a CMS –Roots of Content Management–Branches of Content Management.

UNIT IV DESIGN OF CMS **8**

The Wheel of CMS —Working with Metadata –Cataloging Audiences Designing Publications– Designing content Components–Accounting for Authors-Accounting for Acquisition sources.

UNIT V BUILDING CMS **10**

Content Markup Languages – XML and Content Management – Processing Content.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Discuss the purpose and value of Digital Asset Management.
- Evaluate the various compression and indexing techniques
- Explain various metadata standards.
- Develop applications based on Content of Management system.

TEXT BOOKS:

1. John Rice, Brian Mckerman, Peter Bergman, ”Creating Digital Content”, McGraw-Hill, USA, 2001.
2. BobBoiko,”Content Management Bible”, John Wiley &Sons, USA, 2001.

REFERENCE BOOKS:

1. Abdreas Ulrich Mauthe, Peter Thomas, “Professional Content Management Systems – Handling Digital Media Assets”, John Wiley &Sons, USA, 2004.
2. Dave Addey, James Ellis, PhilSuh, David Thiemecke, “Content Management Systems (Toolof the Trade) ”, A press, First Edition, USA, 2003.
3. Jen Jacobsen, Tilman Steelmaker, Lisa Edwars, “Implementing a Digital Asset Management System-For Animation, Computer Games, and Web Development”, Elsevier Focal Press, 2005.
4. Ian H Witten, Alistair Moffat, Timothy C Bell, “Managing Gigabytes”, Academic Press, USA, 1999.

01UIT917	COMMUNICATION PROTOCOLS	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To explain the internals of the TCP/IP protocols
- To demonstrate how TCP/IP is actually implemented
- To familiarize the interaction among the protocols in a protocol stack

UNIT I INTRODUCTION **9**

Internetworking concepts and architectural model- classful Internet address - CIDR-Subnetting and Supernetting -ARP- RARP- IP - IP Routing -ICMP - Ipv6

UNIT II TCP **9**

Services - header - connection establishment and termination- interactive data flow- bulk data flow- timeout and retransmission - persist timer - keepalive timer- futures and performance

UNIT III IP IMPLEMENTATION **9**

IP global software organization - routing table- routing algorithms-fragmentation and reassembly- error processing (ICMP) -Multicast Processing (IGMP)

UNIT IV TCP IMPLEMENTATION I **9**

Data structure and input processing - transmission control blocks- segment format- comparison-finite state machine implementation-Output processing- mutual exclusion-computing the TCP data length

UNIT V TCP IMPLEMENTATION II **9**

Timers-events and messages- timer process- deleting and inserting timer event- flow control and adaptive retransmission-congestion avoidance and control - urgent data processing and push function.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Outline various communication protocols
- Explain the purpose of various TCP timers.
- Describe the IP routing concepts.
- Compare various implementations of TCP.

TEXT BOOKS:

1. Douglas E.Comer," Internetworking with TCP/IP Principles, Protocols and Architecture", Pearson Education, Vol. 1 & 2 fourth edition, Asia, 2003.
2. W.Richard Stevens," TCP/IP illustrated", Pearson Education, Volume 1, 2003.

REFERENCE BOOKS:

1. Forouzan," TCP/IP protocol suite", TMH, 2nd edition, 2003.
2. John Ray," Using TCP/IP", Prentice Hall of India, 1999.
3. W.Richard Stevens," TCP/IP illustrated", Pearson Education, Volume 2, 2003.
4. Behrouz A. Forouzan, "TCP/IP Protocol suite", Tata McGraw Hill, 2000.

01UIT918	FOSS FOR ENTERPRISE APPLICATIONS	L	T	P	C
		3	0	0	3

OBJECT IVES:

- To demonstrate GNU/Linux Architecture and Linux Distributions
- To explain the File Handling and Graphics Tools
- To import the Linux Web Server Using LAMP

UNIT I GNU/LINUX ARCHITECTURE AND DEVELOPMENT TOOLS 9

GNU/Linux Architecture, Architectural Breakdown of Major Kernel Components, Linux distributions, GNU Compiler Tool Chain, Building Software with GNU Make, Makefile Constructs. Static-Shared-Dynamic Libraries, Building packages with Automake / Autoconf

UNIT II DEPLOYMENT TOOLS 9

Components of a LAMP Server, Manage Multiple Websites with Virtual Hosts, Encrypt Sensitive Pages with SSL, Enable Server-side Includes and CGI Scripts

UNIT III FILE HANDLING TOOLS AND GRAPHICS TOOLS 9

File Handling-API-Character access mechanisms, String access mechanisms, Sequential and Random access methods, Graphics File Formats, Diagramming with Dia, Open Office Draw, GIMP

UNIT IV TEXT PROCESSING TOOLS 9

Bash beginnings, Pathnames and Permissions, Useful elements, cron Job, Script Versions Text Processing with awk and sed scripts

UNIT V VERSIONINGCONTROL,COPYRIGHT ISSUES AND LICENSES 9

Standards for free software projects, Version Control, Bug Tracker, Wikis, Website Licenses, Patents, Copyright assignment and Ownership, Dual Licensing Schemes.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Discuss the architecture and tools for FOSS development.
- Explain deployment tools.
- Build tools for file handling, graphics and text processing.
- Apply various standards, copyright issues and licenses for FOSS.

TEXT BOOKS:

1. M.Tim Jones, “GNU/Linux Application Programming”, Dream Tech Press, 2005.
2. Karl Fogel, “Producing Open Source Software”, OReilly Media Inc, 2005.

REFERENCE BOOKS:

1. I.Christopher Negus, “I.Christopher Negus”, Wiley, 2006.
2. Ellie Quigley, “PERL by Example”, Pearson Education, 2009.
3. Janet Valade, “spring into Linux”, Pearson Education, 2006.
4. Tom Adelstein, Bill Lubanovic, “Linux System Administration”, OReilly, 2007.

01UIT919	SOCIAL NETWORK ANALYSIS	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To introduce the concept of semantic web and related applications
- To explain the knowledge representation using ontology
- To review human behavior in social web and visualization of social networks

UNIT I INTRODUCTION **9**

Introduction to Semantic Web: Limitations of current Web - Development of Semantic Web - Emergence of the Social Web - Social Network analysis: Development of Social Network Analysis - Key concepts and measures in network analysis - Electronic sources for network analysis: Electronic discussion networks, Blogs and online communities - Web-based networks - Applications of Social Network Analysis.

UNIT II MODELLING, AGGREGATING AND KNOWLEDGE REPRESENTATION **9**

Ontology and their role in the Semantic Web: Ontology-based knowledge Representation - Ontology languages for the Semantic Web: Resource Description Framework - Web Ontology Language - Modeling and aggregating social network data: State-of-the-art in network data representation - Ontological representation of social individuals - Ontological representation of social relationships - Aggregating and reasoning with social network data - Advanced representations.

UNIT III EXTRACTION AND MINING COMMUNITIES IN WEB SOCIAL NETWORKS **9**

Extracting evolution of Web Community from a Series of Web Archive - Detecting communities in social networks - Definition of community - Evaluating communities - Methods for community detection and mining - Applications of community mining algorithms - Tools for detecting communities social network infrastructures and communities - Decentralized online social networks - Multi-Relational characterization of dynamic social network communities.

UNIT IV PREDICTING HUMAN BEHAVIOUR AND PRIVACY ISSUES **9**

Understanding and predicting human behavior for social communities - User data management - Inference and Distribution - Enabling new human experiences - Reality mining - Context - Awareness - Privacy in online social networks - Trust in online environment - Trust models based on subjective logic - Trust network analysis - Trust transitivity analysis - Combining trust and reputation - Trust derivation based on trust comparisons - Attack spectrum and countermeasures.

UNIT V VISUALIZATION AND APPLICATIONS OF SOCIAL NETWORKS **9**

Graph theory - Centrality - Clustering - Node-Edge Diagrams - Matrix representation - Visualizing online social networks, Visualizing social networks with matrix-based representations - Matrix and Node-Link Diagrams - Hybrid representations - Applications - Cover networks - Community welfare - Collaboration networks - Co-Citation networks.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

- Develop semantic web related applications
- Represent knowledge using ontology
- Predict human behavior in social web and related communities.
- Visualize social networks.

TEXT BOOKS:

1. Peter Mika, “Social Networks and the Semantic Web”, Springer, First Edition, 2007.
2. BorkoFurht, “Handbook of Social Network Technologies and Applications”, Springer, 1st Edition, 2010.

REFERENCE BOOKS:

1. GuandongXu, YanchunZhang, Lin Li, “Web Mining and Social Networking – Techniques and applications ”, Springer , First Edition , 2011 .
2. Dion Goh, Schubert FOO, ”Social information Retrieval Systems: Emerging Technologies and Applications for Searching the Web Effectively ”, IGI Global Snippet , 2008.
3. Max Chevalier, Christine Julien, Chantal Soule-Dupuy, ” Collaborative and Social Information Retrieval and Access: Techniques for Improved user Modelling ”, IGI Global Snippet , 2009.
4. John G. Breslin, John G. Breslin, StefanDecker, ”The Social Semantic Web ”, Springer, 2009.

01UIT920	ETHICAL HACKING AND INFORMATION FORENSICS	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To introduce the fundamentals of hacking
- To summarize different types of attacks and threats
- To review the fraud prevention approaches and forensic tools

UNIT I INTRODUCTION TO HACKING 9

Hacking windows – Network hacking – Web hacking – Password hacking. A study on various attacks – Input validation attacks – SQL injection attacks – Buffer overflow attacks - Privacy attacks.

UNIT II ATTACK TYPES 9

TCP / IP – Checksums – IP Spoofing port scanning, DNS Spoofing. Dos attacks – SYN attacks, Smurf attacks, UDP flooding, DDOS – Models. Firewalls – Packet filter firewalls, Packet Inspection firewalls – Application Proxy Firewalls, Batch File Programming.

UNIT III THREAT MANAGEMENT 9

Fundamentals of Computer Fraud – Threat concepts – Framework for predicting inside attacks – Managing the threat – Strategic Planning Process.

UNIT IV FRAUD PREVENTION 9

Architecture strategies for computer fraud prevention – Protection of Web sites –Intrusion detection system – NIDS, HIDS – Penetrating testing process – Web Services – Reducing transaction risks.

UNIT V FORENSICS AND TOOLS 9

Key Fraud Indicator selection process customized taxonomies – Key fraud signature selection process – Accounting Forensics – Computer Forensics – Journaling and its requirements – Standardized logging criteria – Journal risk and control matrix – Neural networks – Misuse detection and Novelty detection-Case Study: Forensic Tools-Computer forensics, Memory forensics, Mobile forensics.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Evaluate the ethical Hacking Techniques.
- Classify the types of attacks and threat management.
- Adapt various techniques to improve security.
- Describe the tools for forensics systems.

TEXT BOOKS:

1. Kenneth C.Brancik, “Insider Computer Fraud”, Auerbach Publications Taylor & Francis Group, 2008.
2. AnkitFadia, “Ethical Hacking”, Second edition Macmillan India Ltd, 2006.

REFERENCE BOOKS:

1. Johnston, Samuel, “Offensive Defense: The Art of Data War”, Wiley Publishers, 2010.
2. Krutz R. L, “CEH prep guide the comprehensive guide to certified ethical hacking, Wiley Publishers, 2008.
3. Mitnick, K. D, “Art of Intrusion: The real stories behind the exploits of hackers, intruders, & deceivers”, Wiley Publishers, 2005.
4. Sebastopol C.A, “Security power tools”, O'Reilly, 1st Edition, 2007.

01UIT921	DATA MINING CONCEPTS AND TECHNIQUES	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To introduce the fundamentals of datamining and its functionalities
- To familiarize knowledge in different datamining techniques and algorithms
- To review various application domains of datamining

UNIT I DATA WAREHOUSING 9

Introduction to Data Warehousing-An overview and definition-Differences between Operational Database Systems and Data Warehouses-Difference between OLTP&OLAP-Multi-dimensional Data Model- Star,Snow flakes, and Fact Constellations Schemas for Multi-dimensional Databases- OLAP Operations in Multi-dimensional Data Model: Roll-up, Drill-down, Slice & Dice, Pivot(Rotate)-Indexing OLAP Data-Type of OLAP Servers-ROLAP versus MOLAP versus HOLAP-Data Warehouse Architecture-The Design of A Data Warehouse - The Process of Data Warehouse Design-A3-Tier Data Warehouse Architecture

UNIT II DATAMINING 9

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

UNIT III ASSOCIATIONRULEMININGANDCLASSIFICATION 9

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

UNIT IV CLUSTERING AND APPLICATIONS 9

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

UNIT V ADVANCED MINING 9

Webmining, Webcontent mining, Introduction to Spatial mining & its primitives, spatial classification algorithm (ID3extension),Spatial clustering algorithm(SD), Introduction to temporal mining, Time series, Temporal association rule

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Identify and analyze appropriate data warehousing techniques for a engineering problems
- Apply the basic knowledge of preprocessing techniques for real time applications supports data mining concepts.
- Apply appropriate techniques to implement association mining and classification algorithms
- Apply the knowledge of clustering method for an application
- Analyze an appropriate mining method for an application to improve the mining process.

TEXT BOOKS:

1. Jiawei Han 3rd Edition, and MichelineKamber, JianPei, “DataMining Concepts and Techniques”, Elsevier, 3rd Edition, 2008.
2. AlexBerso, Stephen J.Smith,“Data Warehousing, DataMining & OLAP”, Tenth Reprint, Tata McGraw–Hil zl Edition, 2007.

REFERENCE BOOKS:

1. Margaret H.Dunham, S.Sridhar, “DataMining Introductory & Advance Topics”, 2006.
2. C.S.R.Prabhu,Data Warehousing: Concept, Techniques, Products and Applications”, Prentice Hall of India, 2001.
3. Pang-Ning Tan, Michael Steinbach, Vipin Kumar, “Introduction to Data Mining”, Person Education, 2011.
4. K.P. Soman, Shyam Diwakar and V. Ajay, “Insight into Data mining Theory and Practice, Easter Economy Edition”, Prentice Hall of India, 2006.

01UIT922	SATELLITE COMMUNICATIONS AND BROADCASTING	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To understand the fundamentals of satellite communications
- To explain the design issues of the satellite subsystem and link
- To familiarize the satellite broadcasting techniques applications of GPS

UNIT I INTRODUCTION 9

Origin of Satellite Communications, Historical Back-ground, Basic Concepts of Satellite Communications, Frequency allocations for Satellite Services, Applications, Future Trends of Satellite Communications

UNIT II ORBITAL MECHANICS AND LAUNCHERS 9

Orbital Mechanics, Look Angle determination, Orbital perturbations, Orbit determination, launches and launch vehicles, Orbital effects in communication systems performance.

UNIT III SATELLITE SUBSYSTEMS AND SATELLITE LINK DESIGN 9

Attitude and orbit control system, telemetry, tracking, Command and monitoring, power systems, communication subsystems, Satellite antenna Equipment reliability and Space qualification- Basic transmission theory, system noise temperature and G/T ratio, Design of down links, up link design, Design of satellite links for specified C/N, System design example.

UNIT IV MULTIPLE ACCESS 9

Frequency division multiple access (FDMA) Intermodulation, Calculation of C/N. Time division Multiple Access (TDMA) Frame structure, Examples. Satellite Switched TDMA Onboard processing, DAMA, Code Division Multiple access (CDMA), Spread spectrum transmission and reception.

UNIT V SATELLITE NAVIGATION AND GPS 9

Radio and Satellite Navigation, GPS Position Location principles, GPS Receivers and codes, Satellite signal acquisition, GPS Navigation Message, GPS signal levels, GPS receiver operation, GPS C/A code accuracy, Differential GPS.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Understand the basics of satellite communication & orbital mechanism.
- Discuss broadcast subsystems and system link models
- Identify Satellite Multiple Access Protocol for an application.
- Construct satellite navigation receiver

TEXT BOOKS:

1. Timothy Pratt, Charles Bostian, Jeremy Allnutt, WSE" Satellite Communications Wiley Publications", 2nd Edition, 2003.
2. Wilbur L. Pritchard, Robert A Nelson, Henri G.Suyerhoud, "Satellite Communications Engineering "" Pearson Publications ", 2003.

REFERENCE BOOKS:

1. M. Richharia," Satellite Communications: Design Principles ", BS Publications, 2nd Edition, 2003.
2. D.C Agarwal," Satellite Communication", Khanna Publications, Pearson Education, 5th Edition2003.
3. K.N. Raja Rao," Fundamentals of Satellite Communications", PHI, 2004.
4. Dennis Roddy," Satellite Communications", McGraw Hill, 2nd Edition, 1996.

01UCS902	INFORMATION STORAGE MANAGEMENT	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To introduce storage architectures and key data center elements in classic, virtualized, and cloud environments.
- To explain storage networking technologies such as FC SAN, IP SAN, FCoE, NAS, and object-based and unified storage.
- To discuss the Backup and Archive in virtualized and non-virtualized environment.
- To demonstrate the cloud environment with secured storage infrastructure.

UNIT I STORAGE SYSTEMS 8

Introduction to information storage - evolution of storage architecture, key data center elements, virtualization, and cloud computing - Data center environment - Details key data center elements – host (or compute), connectivity, storage, and application in both classic and virtual environments- RAID - RAID implementations, techniques, and levels along with the impact of RAID on application performance - Intelligent storage system - Details components of intelligent storage systems. It also covers virtual storage provisioning and intelligent storage system implementations.

UNIT II STORAGE NETWORKING TECHNOLOGIES 12

Fibre Channel Storage Area Network (FC SAN) - FC SAN components, connectivity options, and topologies including access protection mechanism „zoning". IP SAN and Fibre Channel over Ethernet (FCoE) - iSCSI and FCIP protocols for storage access over an IP network. Converged protocol FCoE and its components. Network Attached Storage (NAS) - File sharing technology using NAS and covers its benefits, components, and implementations. File level storage virtualization. Object based and Unified Storage - Emerging areas of object-based storage and unified storage solutions. Content addressed storage (CAS) as an implementation of an object-based solution.

UNIT III BACKUP, ARCHIVE, AND REPLICATION 10

Introduction to Business Continuity - information availability and business continuity solutions in both virtualized and non-virtualized environments. Backup and Archive - Backup and recovery in both virtualized and non-virtualized environments - Deduplication technology to optimize data backups along with archival solutions to address fixed content storage requirements. Local Replication - Local replications of data along with data restore and restart considerations. Remote Replication - Remote replication technologies in virtualized and non-virtualized environments. Three-site replication and continuous data replication.

UNIT IV CLOUD COMPUTING 7

Cloud Computing - Cloud computing, its benefits, characteristics, deployment models and services. Cloud challenges and migration considerations.

UNIT V SECURING AND MANAGING STORAGE INFRASTRUCTURE 8

Securing the Information Infrastructure - Framework and domains of storage security along with covering security implementation at storage networking. Security in virtualized and cloud environments. Managing the Information Infrastructure - storage infrastructure monitoring and management - storage tiering, information lifecycle management (ILM), and cloud service management activities

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After successful completion of the course, the students will be able to

- Discuss the various storage system principles
- Describe storage networking technology requirements and solutions
- Explain about the data replication techniques
- Demonstrate cloud deployment models and services
- Identify parameters for managing and monitoring storage infrastructure

TEXT BOOKS:

1. EMC Corporation, Information Storage and Management", Wiley, ISBN number: 04702942134.
2. Robert Spalding , "Storage Networks: The Complete Reference ", Tata McGraw Hill, Osborne, 2003.

REFERENCE BOOKS:

1. G. Somas Sundaram, Alok Shrivastava, , " Information Storage and Management ", Wiley, , India,.
2. Ulf Troppens, Wolfgang Mueller-Friedt, Rainer Erkens, " Storage Network explained : Basic and application of fiber channels, SAN, NAS, iSESI, INFINIBAND and FCOE ", Wiley, India,.
3. Marc Farley, " Building Storage Networks ", Tata McGraw Hill, , Osborne, 2001.
4. Meeta Gupta, " Storage Area Network Fundamentals ", Pearson Education Limited, 2002.

01UEC953	CODING AND INFORMATION THEORY	L	T	P	C
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OBJECTIVES:

- To introduce the basic concepts of information theory and source coding
- To familiarize the students with the concept of Text, Audio, Video, Image and speech compression Techniques and error control codes

UNIT I INFORMATION THEORY 9

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

UNIT II SOURCE CODING: TEXT, AUDIO AND SPEECH 9

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

UNIT III SOURCE CODING: IMAGE AND VIDEO 9

Image and Video Formats – GIF, TIFF, SIF, CIF, QCIF – Image compression: READ, JPEG standards - JBIG, JBIG2 standards– Video Compression: Principles-I,B,P frames, Motion estimation, Motion compensation, H.261, MPEG standards.

UNIT IV ERROR CONTROL CODING: BLOCK CODES 9

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

UNIT V ERROR CONTROL CODING: CONVOLUTIONAL CODES 9

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

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After successful completion of this course, the Students will be able to

- Explain about the basic concepts of information theory
- Apply source coding techniques to Text, Audio, speech, image and Video
- Differentiate Source coding and Channel coding
- Design an efficient data compression scheme for a given information source
- Design different types of error control codes to the given information source for error correction and error detection

TEXT BOOKS:

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

REFERENCE BOOKS:

1. Simon Haykin, "Communication Systems", John Wiley & sons, New York , 4th Edition, 2001.
2. Mark S.Drew, Ze-Nian Li, "Fundamentals of Multimedia" , Prentice Hall of India, 1st Edition, 2003
3. K Sayood, "Introduction to Data Compression" , Elsevier , 3rd Edition, 2006.
4. Amitabha Bhattacharya, "Digital Communication", Tata McGraw Hill ,2006