Estd 1995

SETHU INSTITUTE OF TECHNOLOGY

(An Autonomous Institution)

Pulloor, Kariapatti – 626115.

B.TECH INFORMATION TECHNOLOGY

REGULATIONS 2014

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

Approved in the Academic Council Meeting held on 16.07.2016

CHAIRMAN

ACADEMIC COUNCIL

SETHU INSTITUTE OF TECHNOLOGY

(An Autonomous Institution)

Estd.1995

REGULATIONS 2014

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 2014

Bachelor of Technology in Information Technology

OVERALL COURSE STRUCTURE

Category	Total No. of Courses	Credits	Percentage
Science & Humanities	16	41	21.8
Basic Engineering	8	21	11.3
Professional Subjects–CORE	41	108	57.4
Professional Subjects–ELECTIVE	6	18	9.5
TOTAL	71	188	100

COURSE CREDITS–SEMESTER WISE

Branch	I	II	III	IV	V	VI	VII	VIII	TOTAL
IT	24	24	25	27	26	25	22	15	188

Semester I

Course Code	Course Title	L	T	P	C
THEORY					
14UEN101	Technical English–I (Common to ALL Branches)	3	1	0	4
14UMA102	Engineering Mathematics- I (Common to ALL Branches)	3	1	0	4
14UPH103	Engineering Physics (Common to ALL Branches)	3	0	0	3
14UCY105	Applied Chemistry (Common to CSE,ICE,ECE,EEE,IT & EIE)	3	0	0	3
14UCS106	Computer Programming (Common to ALL Branches)	3	0	0	3
14UME107	Engineering Graphics (Common to ALL Branches)	2	0	3	4
PRACTICAL					
14UCS108	Computer Programming Laboratory –I (Common to ALL Branches)	0	0	2	1
14UME109	Engineering Practices Laboratory (Common to ALL Branches)	0	0	2	1
14UGS110	Physics & Chemistry Laboratory (Common to ALL Branches)	0	0	2	1
	TOTAL	17	2	09	24
Total No. of Credits - 24					

Semester II

Course Code	Course Title	L	T	P	C
THEORY					
14UEN201	Technical English– II (Common to ALL Branches)	3	0	0	3
14UMA202	Engineering Mathematics–II (Common to ALL Branches)	3	1	0	4
14UPH204	Applied Physics (Common to CSE,ICE,ECE,EEE,IT & EIE)	3	0	0	3
14UCY204	Environmental Science (Common to ALL Branches)	3	0	0	3
14UME205	Basic Civil and Mechanical Engineering (Common to MECH,CSE,ICE,ECE,EEE,IT & EIE Branches)	4	0	0	4
14UCS207	Digital Principles and System Design (Common to CSE & IT)	3	0	0	3
PRACTICAL					
14UCS208	Digital Laboratory (Common to CSE & IT)	0	0	3	2
14UCS209	Computer Programming Laboratory–II (Common to ALL Branches)	0	0	2	1
14UGS210	Physics & Environmental Science Laboratory (Common to ALL Branches)	0	0	2	1
	TOTAL	19	1	8	24
Total No. of Credits - 24					

Semester III

Course Code	Course Title	L	T	P	C
THEORY					
14UMA321	Transforms and Partial Differential Equations (Common to ALL Branches)	3	1	0	4
14UIT302	Programming with Data Structures	3	0	0	3
14UIT303	Computer Organization	3	0	0	3
14UIT304	Object Oriented Programming (Common to CSE & IT)	3	0	0	3
14UIT305	Database Systems	3	0	0	3
14UIT306	Analog and Digital Communication	3	0	0	3
PRACTICAL					
14UIT307	Programming with Data Structures Laboratory	0	0	3	2
14UIT308	Object Oriented Programming Laboratory (Common to CSE & IT)	0	0	3	2
14UIT309	Database Systems Laboratory	0	0	3	2
VALUE ADDED COURSE					
14UGS331	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					
14UMA421	Applied Statistics and Queuing Networks (Common to CSE & IT)	3	1	0	4
14UIT402	Analysis and Design of Algorithms	3	1	0	4
14UCS403	Java Programming (Common to CSE & IT)	3	0	0	3
14UIT404	Principles of Operating Systems	3	0	0	3
14UIT405	Object Oriented Software Engineering Methodologies	3	0	0	3
14UEC423	Microprocessors and Microcontrollers (Common to CSE & IT)	3	0	0	3
14UGS431	Qualitative and Quantitative Aptitude (Common to ALL Branches)	1	0	0	1
PRACTICAL					
14UCS407	Java Programming Laboratory (Common to CSE & IT)	0	0	3	2
14UIT408	Operating Systems Practice Laboratory	0	0	3	2
14UEC427	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					
14UMA521	Discrete Mathematics (Common to CSE & IT)	3	1	0	4
14UIT502	Computer Networks (Common to CSE & IT)	3	0	0	3
14UCS503	Object Oriented Analysis and Design (Common to CSE & IT)	3	0	0	3
14UIT504	Embedded Computing Systems	3	0	0	3
14UIT505	Graphics with OPENGL	3	0	0	3
14UIT506	Wireless Communication	3	0	0	3
PRACTICAL					
14UIT507	Computer Networks Laboratory (Common to CSE & IT)	0	0	3	2
14UCS508	Object Oriented Analysis and Design Laboratory (Common to CSE & IT)	0	0	3	2
14UIT509	Graphics Programming Laboratory	0	0	3	2
14UGS531	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					
14UIT601	Service Oriented Architecture	3	0	0	3
14UIT602	Compiler Design	3	0	0	3
14UIT603	Web Technology	3	0	0	3
14UIT604	Cryptography and Network Security	3	0	0	3
	Elective–I	3	0	0	3
	Elective– II	3	0	0	3
PRACTICAL					
14UIT607	Service Oriented Architecture Laboratory	0	0	3	2
14UIT608	Web Technology Laboratory	0	0	3	2
14UIT609	Network Security Laboratory	0	0	3	2
14UIT610	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					
14UME701	Project Management and Finance	3	0	0	3
14UIT702	Advanced Database Systems	3	0	0	3
14UCS703	Insight Into Cloud Computing	3	0	0	3
14UIT704	Mobile Application Development	3	0	0	3
	Elective III	3	0	0	3
	Elective IV	3	0	0	3
PRACTICAL					
14UIT707	Mobile Application Development Laboratory	0	0	3	2
14UIT708	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					
14UME801	Professional Ethics	3	0	0	3
	Elective V	3	0	0	3
	Elective V	3	0	0	3
PRACTICAL					
14UIT803	Project Work	0	0	12	6
	TOTAL	9	0	12	15
Total No. of Credits - 15					

LIST OF ELECTIVES

Course Code	Course Title	L	T	P	C
14UIT901	Distributed Operating Systems	3	0	0	3
14UIT902	Modern Artificial Intelligence	3	0	0	3
14UIT903	Software Architecture	3	0	0	3
14UIT904	Agile Software Development	3	0	0	3
14UIT905	Intrusion Detection System	3	0	0	3
14UIT906	User Interface Framework Development	3	0	0	3
14UIT907	Management Information Systems	3	0	0	3
14UIT908	Grid and Cloud Computing	3	0	0	3
14UIT909	Data Analytics	3	0	0	3
14UIT910	Building Enterprise Applications	3	0	0	3
14UIT911	Adhoc and Sensor Networks	3	0	0	3
14UIT912	Principles of Software Testing	3	0	0	3
14UIT913	Internet of Everything	3	0	0	3
14UIT914	System Software Internals	3	0	0	3
14UIT915	Bio Informatics	3	0	0	3
14UIT916	Digital Asset Management	3	0	0	3
14UIT917	Communication Protocols	3	0	0	3
14UIT918	FOSS for Enterprise Applications	3	0	0	3
14UIT919	Social Network Analysis	3	0	0	3
14UIT920	Ethical Hacking and Information Forensics	3	0	0	3
14UIT921	Data Mining Concepts and Techniques	3	0	0	3
14UIT922	Satellite Communication and Broadcasting	3	0	0	3
14UCS902	Information Storage Management	3	0	0	3
14UEC953	Coding and Information Theory	3	0	0	3

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

14UEN101	TECHNICAL ENGLISH – I (Common to ALL Branches)	L	T	P	C
		3	1	0	4

OBJECTIVES:

- 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 given situations); 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 Speech, Instructions; Speaking- Narrating the Story, Self Introduction; Reading-Reading Short Stories, Newspaper Articles, Skimming; Writing- Summary Writing, Hints Developing, Letter Writing-Formal Letters-Writing a letter to Head of the Institution and Head of the Department; Grammar- Introduction of Past Tense and its four sub divisions, Voice-Active and Passive-Conversion of Assertive Sentence; 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 the Movie, Seeking Permission, Reading- Note Making Skills, Writing- Letter Writing-Formal Letters-Letter to the Editor; Grammar- 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- Report Writing, Writing Review of a Book/ Movie/ Journal; 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, Scanning and Skipping; Writing- Process Description; Grammar- Numerical Adjectives, Sequencing Words, Spelling; Vocabulary- One Word Substitutions

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

COURSE OUTCOMES:

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

- Comprehend and respond to various formal and informal situations
- Demonstrate improved oral fluency
- Exhibit improved reading comprehension, vocabulary and interpretation skills
- Effectively use standard grammar in writing meaningful sentences and paragraphs
- Employ social and professional skills efficiently

TEXT BOOKS:

1. Humanities and Social Sciences Division, Anna University. “English for Engineers and Technologists”. Vol. 1.Chennai, Orient Longman, 2002.
2. Meenakshi Raman, Sangeeta Sharma, “Technical Communication: Principles and Practice”, Oxford University Press India, 2nd Edition, 2012.

REFERENCE BOOKS:

1. Curriculum Development Centre, TTTI, “Communication in English for Technical Students”, Orient Longman, Calcutta, 1984.
2. Sidney Greenbaum, “The Oxford English Grammar”, Oxford University Press, 1996.
3. Ashraf Rizvi.M. “Effective Technical Communication”, Tata McGraw-Hill, New Delhi, 2005
4. Shanta Rameshwar Rao, “Perceptions”, Orient Longman Pvt.Ltd., Chennai,2002

14UMA102 **ENGINEERING MATHEMATICS – I**

(Common to ALL Branches)

L	T	P	C
3	1	0	4

OBJECTIVES :

- To make the students capable of identifying algebraic eigen value problems from practical areas and obtain the eigen solutions in certain cases.
- To make the students knowledgeable in the area of infinite series and their convergence and to be familiar with the limitations of using infinite series approximations for solutions arising in mathematical modeling.
- To familiarize the students with the geometrical aspects of curvature, involutes and evolutes of plane curves, essential concepts for an engineer, as elegant applications of differential calculus.
- To make the student acquire sound knowledge in solving differential equations of certain types, including systems of differential equations that they might encounter in their studies of other subjects in the same or higher semesters.

UNIT I MATRICES 9 + 3

Eigen value 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 – Applications of Matrices.

UNIT II SEQUENCES AND SERIES 9 + 3

Sequences: Definition and examples – Series: Types and Convergence – Series of positive terms – Tests of convergence: Comparison test, Integral Test and D"Alembert"s ratio test – Alternating series – Leibnitz"s test – Series of positive and negative terms – Absolute and Conditional convergence – Convergence condition for Binomial, Exponential and Logarithmic series.

UNIT III DIFFERENTIAL CALCULUS 8 + 3

Curvature in Cartesian coordinates – 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 – Jacobian – Taylor"s expansion – Maxima and Minima – Method of Lagrangian Multipliers.

UNIT V MULTIPLE INTEGRALS 8 + 3

Double integration – Cartesian and Polar coordinates – Change of order of integration – Change of variables between Cartesian and Polar coordinates – Triple integration in Cartesian coordinates – Area as double integral – Volume as triple integral.

SUPPLEMENT TOPIC (for internal evaluation only) **3**

Evocation / Application of Mathematics, Quick Mathematics – Speed Multiplication and Division.

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

COURSE OUTCOMES:

After the successful completion of this course, the student 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, "A Text book of Engineering Mathematics", Laxmi Publications (P) Ltd, New Delhi, 8th Edition, (2011).
2. GREWAL. B.S, "Higher Engineering Mathematics", Khanna Publications, New Delhi, 42nd Edition, (2012).
3. KREYSZIG. E, "Advanced Engineering Mathematics", John Wiley & Sons, New York, 10th Edition, (2011).

REFERENCE BOOKS:

1. RAMANA B.V, "Higher Engineering Mathematics", Tata McGraw Hill Publishing Company, New Delhi, 11th Reprint, (2010).
2. GLYN JAMES, "Advanced Engineering Mathematics", Pearson Education, New Delhi, 7th Edition, (2007).
3. JAIN R.K and IYENGAR S.R.K," Advanced Engineering Mathematics", Narosa Publishing House, New Delhi, 3rd Edition, (2007).
4. BHARATI KRISHNA TIRTHAJI, "Vedic Mathematics - Mental Calculation", Motilal Banarsidass Publications, New Delhi, 1st Edition, (1965).

14UPH103 **ENGINEERING PHYSICS**

(Common To All Branches)

L	T	P	C
3	0	0	3

OBJECTIVES :

- To develop a clear knowledge of principles and applications of ultrasonics
- To make students to understand the working method of different kinds of laser
- To introduce the types of fibre and communication applications
- To explain 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 coeffcients -derivation. Types of lasers –, Nd-YAG- CO2 and Semiconductor lasers (homojunction & heterojunction) - 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

COURSE OUTCOMES:

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

- Explain the methods of ultrasonic production and its merits and demerits
- Discuss the basic principle of Laser, its types and their applications in industries.
- Summarize the Principle of Fibre optics,its types and loses associated with them.
- Demonstrate the operation of Scanning electron microscope.
- Explain the Physics of Crystals.

TEXT BOOKS:

1. Dr. Mani.P, “A Text Book of Engineering Physics”, Dhanam Publications, Edition ,2014, Chennai
2. Rajendran.V, “Engineering,Physics”, Tata Mc-Graw Hill Publishing Company limited, New Delhi, Revised Edition 2013

REFERENCE BOOKS:

1. Raghuvenshi G.S., “Engineering Physics”, PHI Learning Private Limited, New Delhi, Revised Edition 2014.
2. Arul doss .G., “Engineering Physics”, PHI Learning Limited, New Delhi, Revised Edition 2013.
3. Marikani .A., “Engineering Physics”, PHI Learning Private Limited, New Delhi, Revised Edition 2012.
4. Sankar B.N., and Pillai .S.O., “A Text book of Engineering Physics”, New Age International Publishers Private Limited, New Delhi, Revised Edition 2013.

14UCY105	APPLIED CHEMISTRY	L	T	P	C
	(CSE, ICE, ECE, EEE, IT & EIE)	3	0	0	3

OBJECTIVES:

- To give outline the basics of electrochemistry and photochemistry.
- To introduce corrosion and its control methods.
- To explain surface chemistry and chemical analysis methods.

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 Cl^{-} titrations) and Conductometric titrations (HCl vsNaOH).

UNIT II PHOTO CHEMISTRY 9

Photochemical reaction: classification - thermal and photochemical reactions; laws of photochemistry - Grothus –Dropper 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

COURSE OUTCOMES

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

- Explain the basic operations of chemical electrodes and chemical cells
- Discuss the basics of photochemistry and surface chemistry
- Analyze various factor influencing corrosion and their control
- Choose appropriate instrument to analyze chemical properties of given material
- Discuss the types of photochemical reactions and their mechanisms

TEXT BOOKS:

1. Jain P.C.and Monica Jain, “Engineering Chemistry”, Dhanpat Rai Pub, Co., New Delhi 2013.
2. Kannan P and A. Ravikrishnan, “Engineering Chemistry”, Sri Krishna Hitech Publishing Company Pvt. Ltd. Chennai, 2009.

REFERENCES:

1. Sharma B.K, “Engineering chemistry” Krishna Prakasan Media (P) Ltd., Meerut (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, 2014

		L	T	P	C
14UCS106	**COMPUTER PROGRAMMING**				
	(Common to ALL Branches)	**3**	**0**	**0**	**3**

OBJECTIVES:

- To introduce basic organization of computers and problem solving techniques.
- To impart the knowledge of programming constructs of C language.

UNIT I INTRODUCTION **8**

Generation and Classification of Computers - Basic Organization of a Computer – Problem formulation – Problem Solving - Need for logical analysis and thinking – Algorithm – Pseudo code – Flow Chart.

UNIT II C PROGRAMMING BASICS **10**

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.

UNIT III ARRAYS AND STRINGS **9**

Arrays – Initialization – Declaration – One dimensional and Two dimensional arrays. Bubble sort - Linear search - String - String handling using built-in functions and user defined functions.

UNIT IV FUNCTIONS AND POINTERS **9**

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

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

Introduction – need for structure data type – structure definition – Structure declaration – Structure within a structure - Union - Pre-processor directives – File handling.

TOTAL : 45 PERIODS

COURSE OUTCOMES:

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

- Discuss the basic organization of a computer.
- Explain basic primitives of C Language.
- Write simple programs in C.
- Design the Programs using functions.
- Differentiate structures and unions using simple programs.

TEXT BOOKS:

1. Sutha J, “Computer Programming”, Second Edition 2014, littlemoon Publications, Kariapatti.
2. Anita Goel and Ajay Mittal, “Computer Fundamentals and Programming in C”, Dorling Kindersley (India) Pvt. Ltd, Pearson Education in South Asia, 2011.

REFERENCE BOOKS:

1. Pradip Dey and Manas Ghosh, “Fundamentals of Computing and Programming in C”, Oxford University Press, First Edition, 2009.
2. Byron S.Gottfried, “Programming with C”, Schaum‟s Outlines, Tata McGraw-Hill, Second Edition, 2006.
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.

14UME107	ENGINEERING GRAPHICS	L	T	P	C
	(Common to ALL Branches)	2	0	3	4

OBJECTIVES:

- To develop in students graphic skill for communication of concepts, ideas and design of engineering products and expose them to existing national standards related to technical drawings
- To impart knowledge in development of surfaces, isometric and perspective projections

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, PROJECTION OF POINTS, LINES AND PLANE SURFACES 5+9

Plane Curves: (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.

Projections:

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 II PROJECTION OF SOLIDS 6+9

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 III SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES 6+9

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 IV ISOMETRIC AND PERSPECTIVE PROJECTIONS 6+9

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.

UNIT V ORTHOGRAPHIC PROJECTION 6+9

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 of multiple views from pictorial views of objects.

TOTAL: 30 (L) + 45 (T) = 75 PERIODS

COURSE OUTCOMES:

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

- Discuss a simple engineering drawing in First angle projection
- Plot regular objects in different inclined position.
- Analyze information from drawings for making complex geometric models.
- Generate Isomentric views of objects for orthographic projection.
- Estimate significance of a working drawing and proper dimensioning through orthographic projections.

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. Gopalakrishnan K.R., "Engineering Drawing" (Vol .I&II), Subhas Publications,(1998).
4. Dhananjay A.Jolhe, "Engineering Drawing with an introduction to Auto CAD", Tata Mc Graw 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.

14UCS108 **COMPUTER PROGRAMMING LABORATORY – I**

(Common to ALL Branches)

L	T	P	C
0	0	2	1

OBJECTIVES:

- To demonstrate the implementation of programs in C.

LIST OF EXPERIMENTS

a) Unix Commands 2

b) Word Processing 4

Document creation, Formatting, Mail merge

c) Simple C Programming 24

Data types, Branching & Looping Constructs.
One dimensional Arrays, Matrix operations
Functions
Strings

TOTAL: 30 PERIODS

COURSE OUTCOMES:

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

- Create the document in Word Processing software.
- Write programs using control constructs.
- Manipulate Matrix operations in C.
- Apply functions to reduce redundancy.
- Solve string operations without using inbuilt functions.

HARDWARE / SOFTWARE REQUIRED FOR A BATCH OF 30 STUDENTS

HARDWARE

LAN SYSTEM WITH 30 NODES (OR) STANDALONE PCS – 30 NOS.

SOFTWARE

OS – UNIX CLONE **(License free Linux)**
APPLICATION PACKAGE – OFFICE SUITE
COMPILER – C

14UME109	ENGINEERING PRACTICES LABORATORY	L	T	P	C
	(Common to ALL Branches)	0	0	2	1

OBJECTIVES:

- To demonstrate the plumbing and carpentry works.
- To train the students to perform welding and drilling operations.
- To demonstrate residential house wiring, fluorescent lamp wiring, measurement of earth resistance, colour coding of resistors, logic gates and soldering.

LIST OF EXPERIMENTS

GROUP A (CIVIL & MECHANICAL)

I) CIVIL ENGINEERING PRACTICE 6

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 9

Welding:

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

Basic Machining:

a) Drilling Practice

Sheet Metal Work:

a) Model making – Trays, funnels, etc.

b) Study of 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.

(b) Foundry operations like mould preparation for gear and step cone pulley.

GROUP B (ELECTRICAL & ELECTRONICS)

III) ELECTRICAL ENGINEERING PRACTICE 7

(a) Residential house wiring using switches, fuse, indicator, lamp and energy meter and Stair case wiring
(b) Fluorescent lamp wiring.

(c) Measurement of resistance to earth of electrical equipment.

IV) ELECTRONICS ENGINEERING PRACTICE 8

(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 AND, OR, EX-OR and NOT Gate.
(c) Soldering practice – Components, Devices and Circuits – Using general purpose PCB.

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: 30 PERIODS

EQUIPMENT REQUIREMENT

CIVIL ENGINEERING

S.No	Name of the equipment/software	Quantity Required
1	Assort components for plumbing consisting of pipes, plastic pipes, flexible pipes, couplings, unions, elbows, plugs and other fittings	5 Sets.
2	Carpentry vice (fitted to work bench)	15 Nos.

3	Standard woodworking tools	15 Sets
4	Model of industrial trusses, door joints, furniture joints	5 each
5	Power Tool Rotary Hammer	2Nos
6	Demolition Hammer	2Nos
7	Circular Saw	2Nos
8	Planer	2Nos
9	Hand Drilling	2Nos
10	Jigsa	2Nos

MECHANICAL ENGINEERING

Sl. No.	**Name of the equipment/software**	**Quantity Required**
1	Arc welding transformer with cables and holders	5 Nos.
2	Welding booth with exhaust facility	5 Nos.
3	Welding accessories like welding shield, chipping hammer, wire brush, etc.	5 Sets.
4	Oxygen and acetylene gas cylinders, blow pipe and other welding outfit	2 Nos.
5	Smithy tools	2 Sets.
6	Moulding table, foundry tools	2 Sets.
7	Study-purpose items: centrifugal pump, air-conditioner	One each.

ELECTRICAL ENGINEERING

Sl. No.	Name of the equipment/software	Quantity Required
1	Assorted electrical components for house wiring	15 sets
2	Electrical measuring instruments	10 sets
3	Megger (250V/500V)	1 No.
4	Study purpose items: Iron box, fan and regulator, emergency lamp	One each
5	Power Tools: (a) Range Finder (b) Digital Live-wire detector	2 No. 2 No

ELECTRONICS ENGINEERING

Sl. No.	Name of the equipment/software	Quantity Required
1	Logic trainer kit	2
2	CRO,AFO	2 each
3	Small multipurpose PCBs	10 No.
4	Soldering guns	10
5	Multimeters	5 No
6	Assorted electronic components for making circuits	Required quantity

14UGS110	PHYSICS AND CHEMISTRY LABORATORY	L	T	P	C
		0	0	2	1

Objectives:

- To make the students to understand the principle of Lasers and its applications.
- To give knowledge on Ultrasonic Interferometer and Young‟s modulus of Elasticity
- To train the students to perform titration experiment to identify given salt

PHYSICS LABORATORY

LIST OF EXPERIMENTS

1. Semiconductor Laser – Particle size determination and wavelength of Laser source using Diode Laser.
2. Determination of velocity of sound and compressibility of liquid – Ultrasonic Interferometer.
3. Determination of wavelength of mercury spectrum – spectrometer grating.
4. Determination of Young‟s modulus of the material of the beam – Uniform bending
5. Torsional pendulum – Determination of Moment of inertia of a metallic disc rigidity modulus of a given wire.
6. Determination of Young‟s modulus of the material of the beam – Non uniform bending

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

CHEMISTRY LABORATORY

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. Potentiometrictitration (Fe^{2+} / $KMnO_4$ or $K_2Cr_2O_7$)
6. pH titration(acid and base)
7. Determination of molecular weight of a polyvinyl alcohol by viscometry method

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

TOTAL: 30PERIODS

COURSE OUTCOMES:

After the successful completion of this course, the student 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

Laboratory classes on alternate weeks for Physics and Chemistry

14UEN201	TECHNICAL ENGLISH - II (Common to ALL Branches)	L	T	P	C
		3	0	0	3

OBJECTIVES:

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

UNIT I **9**

Listening- Listening to Telephonic Conversations; Speaking- Offering Suggestions, Introducing others; Reading- Skimming, Scanning and Skipping; Writing-Formal Letters-Business Letters: Authorization Letter, Inquiry Letter, Recommendation Letter; Grammar-Prepositions, Conjunctions, Infinitives; Vocabulary-Prepositional Phrases.

UNIT II **9**

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

UNIT III **9**

Listening- Introduction to Phonetic Symbols ; Speaking- Speaking Sentences with Stress and Intonations; Reading-Reading News Paper Articles, Journals, Magazines –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**

Listening- Listening and Guided Note Taking; Speaking- Persuasive Strategies, Presentation of Problems and Solutions; Reading-Read to Understand the Given Context; Writing- Letter Writing; (Inviting, Accepting and Declining), ; Grammar- Modal verbs, Articles; Sentence Completion; Vocabulary- Derivatives of Root Words.

UNIT V **9**

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(L) = 45 Periods

COURSE 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 discussions
- Write clear and concise technical paper, resume, report and email
- Demonstrate comprehension of content and vocabulary
- Effectively employ critical analysis skills

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, Sangeeta Sharma, "Technical Communication: English Skills for Engineers ", Oxford University press,2008.

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.
3. Ashraf Rizvi.M, "Effective and Technical Communication", Tata McGraw-Hill, Ninth Edition, New Delhi, 2005.
4. Mark Twain, "Excerpts from Tom Sawyer", Rupa Publications India Pvt. Ltd., New Delhi,2012

14UMA202 **ENGINEERING MATHEMATICS – II**

(Common to ALL Branches)

L	T	P	C
3	1	0	4

OBJECTIVES :

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

UNIT I ANALYTICAL SOLUTIONS OF 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 – Applications of ODE (Bacterial growth, Population growth, Decayed problems).

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 parallelopiped.

UNIT III ANALYTIC FUNCTIONS 8 + 3

Functions of a complex variable – Analytic function – Necessary and Sufficient Conditions (excluding Proofs) – Harmonic function - Properties of an 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, Cauchy‟s integral formula and Cauchy Residue Theorem – Taylor‟s and Laurent‟s expansions – Applications of residue theorem to evaluate real integrals – Unit circle and semi-circular contour (excluding Poles on the real axis).

UNIT V LAPLACE TRANSFORM 9 + 3

Existence conditions – Transform of elementary functions – Basic properties – Transform of derivatives and integrals – Transform of unit step function, impulse function and periodic function - Inverse Laplace transform – Convolution theorem (excluding Proof) –Solution of linear ODE of second order with constant coefficients – Numerical solution of first order ODE by Taylor‟s series

method and Euler‟s method - First and second order ODE by fourth order Runge – Kutta method.

SUPPLEMENT TOPIC (for internal evaluation only) **3**

Evocation / Application of Mathematics, Arithmetical, Ability – Time and Work – Time and Distance.

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

COURSE OUTCOMES:

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

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

TEXT BOOKS:

1. BALI N. P and MANISH GOYAL, “Text book of Engineering Mathematics”, Laxmi Publications (P) Ltd., New Delhi, 3rd Edition, (2008).
2. GREWAL. B.S, “Higher Engineering Mathematics”, Khanna Publications, New Delhi, 42nd Edition, (2012).
3. SANKAR RAO. K, “Numerical Methods for Scientists and Engineers”, Prentice Hall of India, New Delhi, 3rd Edition, (2007).

REFERENCE BOOKS:

1. RAMANA B.V, “Higher Engineering Mathematics”, Tata McGraw Hill Publishing Company, New Delhi, 11th Reprint, (2010).
2. KREYSZIG. E, “Advanced Engineering Mathematics”, John Wiley & Sons, New York, 10th Edition, (2011).
3. JAIN R.K and IYENGAR S.R.K, “Advanced Engineering Mathematics”, Narosa Publishing House Pvt. Ltd., New Delhi, 3rd Edition, (2007).
4. GERALD C.F. and WHEATELEY, P.O. “Applied Numerical Analysis”, Pearson Education, New Delhi, 7th Edition, (2003).
5. AGARWAL R.S., “Quantitative Aptitude”, S. Chand Publications, New Delhi, 7th Edition, (2008), pp. 341-370, 384-404.

14UPH204	APPLIED PHYSICS	L	T	P	C
	(Common To CSE, ICE, ECE, EEE, IT & EIE Branches)				
		3	0	0	3

OBJECTIVES :

- To get a clear knowledge about the principles of conducting materials
- To impart the knowledge of magnetic, superconducting, optical and dielectric materials.
- To develop the fundamental research interest in new engineering 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

COURSE OUTCOMES:

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

- Discuss the principle of conducting materials and semiconductors
- Classify materials based on their electrical conducting properties.
- Summarize the applications of electrical materials.
- Explain the procedure of nanomaterial synthesis.
- Describe the properties of optical materials.

TEXT BOOKS:

1. Dr. Mani.P , “A Text Book of Engineering Physics”, Dhanam Publications, Chennai Revised Edition 2014
2. Rajendran.V , “Engineering Physics”, Tata Mc Graw Hill Publications Ltd, New Delhi Revised Edition 2013

REFERENCE BOOKS:

1. Serway and Jewett, “Physics for Scientists and Engineers with Modern Physics”,6th Edition, Thomson Brooks/Cole, Indian reprint, Revised Edition 2012
2. Rajendran.V and Marikani.A , “Engineering Physics”, Tata Mc Graw Hill Publications Ltd, III Edition, New Delhi Revised Edition 2012
3. PalanisamyP.K , “Engineering Physics”, Scitech publications, Chennai, Revised Edition 2014
4. Jayakumar .S, “Engineering Physics”, R.K. Publishers, Tirunelveli, Revised Edition , 2014

14UCY204	ENVIRONMENTAL SCIENCE	L	P	T	C
	(Common to ALL Branches)	3	0	0	3

OBJECTIVES

- To introduce the effect of technology on the environment and ecological balance.
- To discuss valuable information about the conditions of environment.
- To train the students to learn environmental studies and solve the problems.
- To create awareness about the environmental pollution and their problems

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 / Agricultura

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 protection act – Air (Prevention and Control of Pollution) act – Water (Prevention and control of Pollution) act – Wildlife protection act – Forest conservation act – enforcement machinery involved in environmental legislation – 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

COURSE OUTCOMES

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

- Realize the importance of environment
- Know about the precious resources in the environment
- Learn to conserve the resources
- Perform their role in maintaining a clean environment for future generation
- Maintain ecological balance and preserve bio-diversity

TEXT BOOKS

1. Anubha Kaushik, kaushik C.P., “Environmental Science and Engineering”, Third Edition, New Age International, New Delhi, 2009.
2. Benny Joseph “Environmental Science and Engineering”, Tata Mc-Graw Hill, New Delhi, 2006.

REFERENCE BOOKS:

1. Gilbert M.Masters, „Introduction to Environmental Engineering and Science", Pearson Education,Upper saddle River, New Jersey, 2008.
2. Miller T.G. Jr., Environmental Science", Wadsworth Publishing Company, Belmont, California, 2005.
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 Publication, Jaipur, 2005.

	BASIC CIVIL AND MECHANICAL ENGINEERING	L	T	P	C
14UME205	(Common to MECH., CSE, ICE, ECE, EEE, IT & EIE branches)				
		4	0	0	4

OBJECTIVES :

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

A – CIVIL ENGINEERING

UNIT I **15**

SURVEYING AND CIVIL ENGINEERING MATERIALS

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

COURSE OUTCOMES:

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

- Receive knowledge in measurement of landscape and different building materials
- Comprehension the different building structure and its application in different places
- Synthesis the ideas of variety of energy sources into practical one
- Evaluation of IC engine about its performance and compared it with diesel engine power plant
- Knowledge about Refrigeration and Air conditioning techniques

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. Venugopal K., Prabhu Raja V., and Sreekanjana G., "Basic Civil and Mechanical Engineering", Anuradha Publications, Third Edition (2010).
2. Ramamrutham S., "Basic Civil Engineering", Dhanpat Rai, Publishing Co. (P) Ltd, (1999).
3. Seetharaman S., "Basic Civil Engineering", Anuradha Agencies, (2005).
4. Shantha Kumar S.R.J., "Basic Mechanical Engineering", Hi-Tech Publications, Mayiladuthurai, (2000).

DIGITAL PRINCIPLES AND SYSTEM DESIGN

14UCS207	L	T	P	C
(Common to CSE & IT)				
	3	**1**	**0**	**4**

OBJECTIVES :

- To introduce various number systems, Boolean algebra and various logic gates.
- To make the students to design various combinational and sequential circuits.
- To familiarize the students on programming with HDL for combinational and sequential circuits.

UNIT I BOOLEAN ALGEBRA AND LOGIC GATES 8 + 3

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

UNIT II COMBINATIONAL LOGIC 10 + 3

Combinational Circuits – Analysis and Design Procedures – Circuits for Arithmetic Operations- Binary Adder, Binary Subtractor , Binary Multiplier , BCD Adder, Magnitude Comparator- Code Conversion – Introduction to Hardware Description Language(HDL).

UNIT III DESIGN WITH MSI DEVICES 8 + 3

Decoders and encoders - Multiplexers and Demultiplexers - Memory and programmable logic –HDL for combinational circuits.

UNIT IV SYNCHRONOUS SEQUENTIAL LOGIC 10 + 3

Sequential Circuits – Flip Flops – Analysis and Design Procedures – State Reduction and State Assignment – Shift Registers – Counters :Synchronous - Up, Down and Up/Down , Asynchronous - Up, Down and Up/Down – HDL for sequential circuits.

UNIT V ASYNCHRONOUS SEQUENTIAL LOGIC 9 + 3

Types of Asynchronous Sequential Circuits - Analysis and Design of Fundamental Mode Asynchronous Sequential Circuits – Reduction of State and Flow Tables – Race-free State Assignment – Hazards – ASM chart

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

COURSE OUTCOMES:

After the successful completion of this course, the student 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, Michael D. Ciletti, "Digital Design", IV Edition, Pearson Education, 2008.
2. John F. Wakerly, "Digital Design Principles and Practices", Fourth Edition, Pearson Education, 2007.

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, 2003.
3. Kharate G. K., "Digital Electronics", Oxford University Press, 2010.
4. Atul P.Godse and Deepali A.Godse, " Digital Principles and System Design", First Edition,Technical Publication, 2014.

14UCS208	DIGITAL LABORATORY (Common to CSE & IT)	L	T	P	C
		0	0	3	2

OBJECTIVES:

- To demonstrate the knowledge in design and implementation of digital logic circuits.

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.

HARDWARE REQUIREMENT

S.No.	Description of Equipment	Quantity required
1.	IC trainer Kit(With Power supply , Bread Board, Assembled LED board/LEDs , Seven segment display)	15
2.	Digital Multimeter	5
3.	Chips IC – 7400	20
4.	Chips IC – 7402	20
5.	Chips IC – 7408	20
6.	Chips IC – 7486	20
7.	Chips IC – 7483	20
8.	Chips IC – 7432	20
9.	Chips IC – 7410	20
10.	Chips IC – 7411	20
11.	Chips IC – 74150	20
12.	Chips IC – 74180	20
13.	Chips IC – 74151	20
14.	Chips IC – 74147	20
15.	Chips IC – 7474	20
16.	Chips IC – 7490	20
17.	Chips IC – 7447	20
18.	Chips IC – 7476	20
19.	Chips IC – 7473	20
20.	Chips IC – 7485	20
21.	Chips IC – 7491	20

22.	Chips IC – 7404	20
23.	Chips IC – 7494	20
24.	Work tables	10
25.	Computer with HDL software	15
26.	Wires (Single strand)	

14UCS209	COMPUTER PROGRAMMING LABORATORY – II (Common to ALL Branches)	L	T	P	C
		0	0	2	1

OBJECTIVES:

- To train the students with the advanced C Programming concepts.

LIST OF EXPERIMENTS

Advanced C Programming

Functions and Strings

Pointers and Arrays

Structures and Unions

Dynamic Storage Allocation

File Handling

Total: 30 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.

HARDWARE / SOFTWARE REQUIRED FOR A BATCH OF 30 STUDENTS

HARDWARE

LAN SYSTEM WITH 30 NODES (OR) STANDALONE PCS – 30 NOS.

SOFTWARE

OS – UNIX CLONE **(License free Linux)**
COMPILER – C

14UGS210	PHYSICS AND ENVIORNMENTAL SCIENCE LABORATORY	L	T	P	C
		0	0	2	1

Objectives:

- To introduce experimental procedure to determine band gap of a semiconducto viscosity of liquid and thickness of a thin wire.
- To demonstrate the working of Spectrometer, Semiconductor Laser and Lee"s Di apparatus.
- To develop the students in practical skills for evaluate the quality parameters of water soil and industrial effluents.

PHYSICS LABORATORY

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 thickness of a thin wire – Air Wedge method.
5. Semiconductor Laser – Calculation of Numerical Aperture and Acceptance angle.
6. Determination of thermal conductivity of a bad conductor – Lee"s Disc method

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

CHEMISTRY LABORATORY

1. Determination of pH of water sample
2. Determination of electrical conductivity of water sample
3. Estimation fo 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 industrial effluents.

- **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

Laboratory classes on alternate weeks for Physics and Chemistry

14UMA321	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).

14UIT302	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.

14UIT303	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.

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 - Nano programming -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 hazards
- 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.

14UIT304	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, First Edition ,2007.
2. Robert Lafore, Object Oriented Programming in C++ Pearson, Fourth Edition, 2002.

REFERENCE BOOKS:

1. Joshva Devadas.T, A.Chandrababu. “A Programming with C++”, Narosa Publishing House, First 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.

14UIT305	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.

14UIT306	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:

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

REFERENCE BOOKS:

1. M.C. Jeruchim, Philip Balaban, K. Sam Shanmugam, “Simulation of Communication Systems”, Plenum Press, New York, First Edition, 1992.
2. H.Taub, D L Schilling, G Saha, “Principles of Communication”, 3rd Edition, 2007.
3. B.P.Lathi, “Modern Analog and Digital Communication systems”, Oxford University Press, 2nd Edition ,2007.
4. Martin.S Roden, “Analog and Digital Communication System”, Prentice Hall of India, Third Edition, 2002

14UIT307	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++

14UIT308	OBJECT ORIENTED PROGRAMING LABORATORY	L	T	P	C
	(Common to CSE & IT)	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++

14UIT309	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

14UGS331	VALUE EDUCATION AND HUMAN RIGHTS	L	T	P	C
	(Common to ALL Branches)				
		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.

14UMA421	APPLIED STATISTICS AND QUEUEING NETWORKS	L	T	P	C
	(Common to CSE & IT)	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

- Apply the acquired knowledge of standard distributions 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.
- Apply basic probability techniques and models to analyze the performance of computer systems, and, in particular, of networks and queues.

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).

14UIT402	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 algorithm
- 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, Second Edition, 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, First Edition, 2005.

14UCS403	JAVA PROGRAMMING (Common to CSE & IT)	L 3	T 0	P 0	C 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.

14UIT404	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 different types of operating systems
- 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, First Edition, 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.

14UIT405	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, Prescriptive 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.

14UEC423	MICROPROCESSORS AND MICROCONTROLLERS	L	T	P	C
	(Common to CSE & IT)	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.

14UGS431	QUALITATIVE AND QUANTITATIVE APTITUDE	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).

14UCS407	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.

14UIT408	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 server
2. Java SE or Equivalent Edition.

14UEC427	**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 programs
- 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

14UMA521	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

- Apply the acquired knowledge of the concepts needed to test the logic of the program
- Synthesize induction hypotheses and simple induction proofs which is a very important tool in computer science engineering
- Identify the basic properties of graphs, trees and use these concepts to model simple applications
- Analyze the structures on many levels
- Apply the acquired knowledge of partial order, Lattices and Boolean algebra which play an important role in many disciplines of computer science

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).

14UIT502 **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.

14UCS503	OBJECT ORIENTED ANALYSIS AND DESIGN	L	T	P	C
	(Common to CSE & IT)	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", Pearson Education, Third Edition, 2005.
2. G. Booch, J. Rumbaugh, and I. Jacobson: The Unified Modeling Language User Guide, Addison-Wesley, First Edition, 1998.

REFERENCE BOOKS:

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

14UIT504	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:

- D Explain architecture and programming of the 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, First Edition,1999.
3. C.M. Krishna, Kang G. Shin, “Real-Time Systems”, International Editions, Mc Graw Hill, Sixth Edition,1997
4. K.V.K.K.Prasad, “Embedded Real-Time Systems: Concepts, Design & Programming”, Dream Tech Press, Eighth Edition, 2005.

14UIT505	GRAPHICS WITH OPENGL	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To introduce the concepts and techniques used in two-dimensional and three-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 graphic primitives using 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.

14UIT506	WIRELESS COMMUNICATION	L	T	P	C
		3	0	0	3

COURSE OBJECTIVE:

- Know the characteristic of wireless channel
- Learn the various cellular architectures concepts
- Understand the concepts behind various digital signaling schemes for fading channels
- Be familiar the various multipath mitigation techniques
- Understand the various multiple antenna systems

UNIT I WIRELESS CHANNELS 9

Large scale path loss – Path loss models: Free Space and Two-Ray models -Link Budget design – Small scale fading- Parameters of mobile multipath channels – Time dispersion parameters - Coherence bandwidth – Doppler spread & Coherence time, Fading due to Multipath time delayspread – flat fading – frequency selective fading – Fading due to Doppler spread – fast fading – slow
fading.

UNIT II CELLULAR ARCHITECTURE 9

Multiple Access techniques - FDMA, TDMA, CDMA – Capacity calculations–Cellular concept- Frequency reuse - channel assignment- hand off- interference & system capacity- trunking& grade of service – Coverage and capacity improvement.

UNIT III DIGITAL SIGNALING FOR FADING CHANNELS 9

Structure of a wireless communication link, Principles of Offset-QPSK, p/4-DQPSK, Minimum ShiftKeying, Gaussian Minimum Shift Keying, Error performance in fading channels, OFDM principle –Cyclic prefix, Windowing, PAPR.

UNIT IV MULTIPATH MITIGATION TECHNIQUES 9

Equalisation – Adaptive equalization, Linear and Non-Linear equalization, Zero forcing and LMSAlgorithms. Diversity – Micro and Macrodiversity, Diversity combining techniques, Error probability in fading channels with diversity reception, Rake receiver

UNIT V MULTIPLE ANTENNA TECHNIQUES 9

MIMO systems – spatial multiplexing -System model -Pre-coding - Beam forming – transmitterdiversity, receiver diversity- Channel state information-capacity in fading and non-fading channels.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

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

- Classify the different fading techniques
- Choose the appropriate multiple access techniques for any scenario
- Analyze various signaling schemes for fading channels
- Compare multipath mitigation techniques and analyze their performance
- Design MIMO systems with transmit/receive diversity

TEXT BOOKS:

1. Rappaport, T.S.," Wireless communications ", Pearson Education, 2nd Edition, 2010.
2. Andreas.F. Molisch, "Wireless Communications", John Wiley – India, 2006.

REFERENCE BOOKS:

1. David Tse and PramodViswanath, "Fundamentals of Wireless Communication ", Cambridge University Press, 2005.
2. UpenaDalal, " Wireless Communication", Oxford University Press, 2009.
3. Van Nee, R. and Ramji Prasad, "OFDM for wireless multimedia communications", Artech House, 2000.
4. Jochen Schiller,"Mobile Communication", Pearson Education Asia Ltd., 2nd, 2008.

14UIT507	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)

14UCS508	**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

SOFTWARE AND HARDWARE REQUIREMENT

SOFTWARE:

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

HARDWARE:

Standalone desktops 30 Nos

14UIT509	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. Implementation of 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
14UGS531	(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

14UIT601	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 WS specification standards for an applications

TEXT BOOKS:

1. Thomas Erl, “Service-Oriented Architecture: Concepts, Technology, and Design”, The prentice Hall publications, First Edition,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, , First Edition, 2012.

REFERENCE BOOKS:

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

14UIT602	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, Second Edition,2007.
2. David Galles, “Modern Compiler Design”, Pearson Education Asia, First Edition,2007.

REFERENCE BOOKS:

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

14UIT603	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 for a web service
- 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,First Edition, 2006.
2. Harvey Deitel, Abbey Deitel, “Internet and World Wide Web: How to Program” 5th Edition, 2011.

REFERENCE BOOKS:

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

14UIT604	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. Behrouz A.Foruzan,”Cryptography and Network Security”, Tata McGraw Hill, Special Indian Edition,2007.

REFERENCE BOOKS:

1. W. Mao, “Modern Cryptography Theory and Practice”, Second Edition, Pearson Education, 2007.
2. Bruce Schneier, “Applied Cryptography”, Second Edition, John Willey and Sons, 2002. ISBN: 9971-51-348-X.
3. Roberta Bragg, Mark Rhodes, Keith Strassberg, “Network Security”, Tata Mcgraw Hill Edition, 2004. ISBN-13: 978-0-07-058671-0.
4. Charles P Fleeger, Shari Lawerence P Fleeger, “Security in Computing”, PHI, Third Edition, 2006

14UIT607	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.

14UIT608	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

14UIT609	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 the 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.

14UIT610	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

PROJECT MANAGEMENT AND FINANCE

14UME701	(Common to MECH, ICE, CSE, 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, 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, Project Performance Measurement and Control - Monitor and assess project performance, schedule, and cost. 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 - 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.MantelJr, “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.

14UIT702	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 .

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.

14UCS703	INSIGHT INTO CLOUD COMPUTING (COMMON TO CSE & IT)	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To introduce the essentials of building fully featured applications on various cloud models.
- To familiarize the concepts of designing and developing various service models (IaaS, PaaS and SaaS) and deployment models (Public, Private and Hybrid clouds).
- To impart the knowledge of Multi-cloud management systems and business clouds.

UNIT I OVERVIEW OF CLOUD COMPUTING **7**

Brief history and evolution - History of Cloud Computing, Evolution of Cloud Computing, Traditional vs. Cloud Computing. Why Cloud Computing, Cloud service models (IaaS, PaaS&SaaS). Cloud deployment models (Public, Private, Hybrid and Community Cloud), Benefits and Challenges of Cloud Computing.

UNIT II PRIVATE CLOUDS **10**

Basics of virtualization, Virtualization technologies, Server virtualization, VM migration techniques, Role of virtualization in Cloud Computing. Business cases for the need of Cloud computing environment, Private Cloud Definition, Characteristics of Private Cloud, Private Cloud deployment models, Private Cloud Vendors, Private Cloud Building blocks namely Physical Layer, Virtualization Layer, Cloud Management Layer, Challenges to private Cloud, Virtual Private Cloud.

UNIT III PUBLIC CLOUDS **10**

What is Public Cloud, Why Public Cloud, When to opt for Public Cloud, Public Cloud Service Models, and Public Cloud Players. Infrastructure as a Service Offerings, IaaS Vendors, PaaS offerings, PaaS vendors, Software as a Service.

UNIT IV CLOUD SECURITY **9**

Security concerns in Traditional IT, Challenges in Cloud Computing in terms of Application Security, Server Security, and Network Security. Security reference model, Abuse and Nefarious Use of Cloud Computing, Insecure Interfaces and APIs, Malicious Insiders, Shared Technology Issues, Data Loss or Leakage, Account or Service Hijacking, Unknown Risk Profile, Different vendors offering Cloud Security for public and private clouds.

UNIT V MULTI-CLOUD MANAGEMENT SYSTEMS AND BUSINESS CLOUDS **9**

Concept of multi-cloud management, Challenges in managing heterogeneous clouds, benefits and advantages of multi-cloud management systems.

Cloud Computing in Business, Various Biz Clouds focused on industry domains (Retail, Banking and Financial sector, Life Sciences, Social networking, Telecom, Education).

TOTAL: 45 PERIODS

COURSE OUTCOMES:

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

- Explain the concepts of Cloud Computing and the various deployment and service models of Cloud Computing
- Apply the virtualization techniques to provide IaaS

- Apply Aneka tools and other techniques to provide PaaS and SaaS
- Identify issues of security concerns in Cloud Computing
- Describe Multi- Cloud management System for various applications

TEXT BOOKS:

1. Rajkumar Buyya, Christian Vecchiola and ThamariSelvi S —Mastering in Cloud Computing‖, McGraw Hill Education (India) Private Limited, 2013.

REFERENCE BOOKS:

- Anthony T Velte,Cloud Computing: A practical Approach‖, Tata McGraw Hill, 2009.
- Michael Miller,Cloud Computing‖, Pearson Education, New Delhi, 2009
- Judith Hurwitz, Robin Bloor, Marcia Kaufman, Fern Halper, "Cloud Computing for Dummies,Wiley,2010

14UIT704	MOBILE APPLICATION DEVELOPMENT	L	T	P	C
		3	0	0	3

COURSE OBJECTIVES:

- Understand the essentials of mobile apps development
- Understand the fundamental concepts of designing and developing
- Learn the major considerations of graphics and multimedia.
- Learn the various testing process.

UNIT I GETTING STARTED WITH MOBILE APPS **9**

An introduction to mobile development history- Overview of Architecture of Android – A walk through to Android Studio - Working with emulator.

UNIT II ELEMENTS OF DESIGNING **9**

User Interface Designing – Mobile Layouts – Mobile User Interface Elements-Draw-able-widgets-menu

UNIT III PROGRAMMING WITH MOBILE APPS **9**

An introduction to programming- Configuring an app- Threads, Async task, Services – states and life cycle-Notifications-Broadcast receivers-Telephony and SMS APIs-Native data handling – on-device file I/O, shared preferences,

UNIT IV ANIMATION AND SENSORS **9**

Graphics and animation – custom views-canvas-animation APIs- multimedia – audio/video playback and record- location awareness and native hardware access (sensors)

UNIT V CONNECTING TO THE DATA BASES AND TESTING **9**

Mobile databases -SQLite, and enterprise data access (via Internet/Intranet)-Connecting Apps with database- Testing - White box testing-Black box testing and test automation of mobile apps-Robotium-Versoning and Staging(Deployment).

TOTAL: 45 PERIODS

COURSE OUTCOMES:

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

- Apply appropriate key techniques and tools for developing and maintaining mobile applications
- Identify the user interface requirements for mobile platforms and analyze the appropriate strategies for Development and deployment
- Apply the Knowledge of advanced Java competency in mobile application development
- Identify, review and analyze the appropriate UI layout for the mobile application development
- Develop mobile apps using Android as development platform with key focus on user experience

TEXT BOOKS:

1. Neil Smyth ,"Andriod Studio Development Essentials. ", Andriod 6 the Edition,2015.
2. Barry A Burd,"Android Application Development All-in-One For Dummies, 2nd Edition ", Wiley ,2015.

REFERENCEBOOKS:

1. Lauren Darcey and Shane Conder ," Teach Yourself Android Application Development In 24 Hours Edition:I", SAMS,2012. .
2. Mike Van Drongelen,"Andriod Studio Cook Book", Packt Publishing, , 2015.
3. Clifton Craig and Adam Gerfer ,"Learn Androd Studio ", 1st Edition, , 2015.
4. Kevin Grant and Chris Haseman ,"Beginning Andriod Programming Development and Design", Peachpit Press , 2014.

14UIT707	MOBILE APPLICATION DEVELOPMENT 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 Display Hello World
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 SDK 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)

TOTAL: 30 PERIODS

COURSE OUTCOMES:

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

- Write simple programs to display various layouts
- Implement the different menu, button controls
- Construct an animation application
- Build the robust & scalable 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.

14UIT708	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

14UME 801	PROFESSIONAL ETHICS	L	T	P	C
	(Common to All)				
		3	0	0	3

OBJECTIVES:

- To impart knowledge on a values-based approach and provide a method of thinking about and dealing with ethical issues in the work place.
- To explain what a profession is and what it means to act

UNIT I ENGINEERING ETHICS 9

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

UNIT II ENGINEERING AS SOCIAL EXPERIMENTATION 8

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

UNIT III ENGINEER'S RESPONSIBILITY FOR SAFETY 9

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

UNIT IV RESPONSIBILITIES AND RIGHTS 9

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

UNIT V GLOBAL ISSUES 9

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

TOTAL: 45 PERIODS

COURSE OUTCOMES:

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

- Identify and apply the content of at least one example of a law (state, national, or international) dealing with engineering ethics
- Apply the code of ethics/conduct of at least one professional society
- Describe their own personal definition of what makes for an ethical engineer
- Explain historical, legal, professional, and personal reasons why legal and professional
- Judge the ethical issues and professional importance in the society

TEXT BOOKS:

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

REFERENCE BOOKS:

1. Charles D Fleddermann, “Engineering Ethics ”, Prentice Hall, New Mexico,1999.
2. John R Boatright, “Ethics and the Conduct of Business ”, Pearson Education, 2003.
3. Edmund G Seebauer, Robert L Barry “Fundamentals of Ethics for Scientists and Engineers ”, Oxford University Press, 2001.
4. David Ermann, Michele S Shauf “Computers, Ethics and Society ”, Oxford University Press,2003.

14UIT803	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

14UIT901	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
- Adapt trends in distributed file systems.
- Implement the real time shared memory systems.

TEXT BOOKS:

1. Pradeep K.Sinha," Distributed operating systems: concepts and design", PHI, First Edition,2007.
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,First Edition, 2000.
2. Andrew S.Tanenbaum, Marteen Van Steen, “Distributed Systems Principles And Paradigms”, Pearson Edition, Second Edition 2007.
3. M.L.Liu, “Distributed Computing Principles and Applications”, Pearson Addison Wesley,First Edition, 2004.
4. MukeshSinghal, “Advanced Concepts In Operating Systems”, McGraw-Hill Series in Computer Science, First edition,1994

14UIT902	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
- Choose appropriate AI methods to solve a given problem
- Design and carry out an empirical evaluation of different AI algorithms
- Differentiate the types of grammars

TEXT BOOKS:

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

REFERENCE BOOKS:

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

14UIT903	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

- Understand the significance of software architecture in large scale software systems
- Recognize major software architectural styles, design patterns, and frameworks
- Generate architectural alternatives for a problem based on quality attributes
- Develop software architectures using various documentation approaches
- Build the systems using paradigms.

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, 1st Edition ,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, 1st Edition ,2001.
3. Rajkumar Buyya, James Broberg, and Andrzej Goscinski, "Cloud Computing. Principles and Paradigms", John Wiley & Sons, 1st Edition , 2011
4. Mark Hansen, "SOA Using Java Web Services", Prentice Hall, 1st Edition, 2007.

14UIT904	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

- Apply the knowledge of design principles and refactoring techniques to achieve Agility
- Function effectively as an individual and as a member or leader in agile framework
- Apply appropriate techniques for Test Driven Development
- Design solution for complex information and communication engineering problems using agile principles
- Formulate testing activities within an Agile project to meet the industry trends

TEXT BOOKS:

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

REFERENCE BOOKS:

1. Lisa Crispin, Janet Gregory, "Agile Testing: A Practical Guide for Testers and AgileTeams", Addison Wesley, ,2008.
2. AlistairCockburn,"AgileSoftwareDevelopment:TheCooperativeGame",AddisonWesley,2006
3. Mike Cohn, " User Stories Applied: For Agile Software", Addison Wesley , 1stEdition
4. http://martinfowler.com/agile.html
5. www.it-ebooks.info/tag/agile

14UIT905	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

- Explain basics of intrusion detection system techniques.
- 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, First Edition,2010.
2. Carl Enrolf, Eugene Schultz, Jim Mellander, ”Intrusion detection and Prevention”, McGraw Hill, First Edition,2004.

REFERENCE BOOKS:

1. Paul E. Proctor, “The Practical Intrusion Detection Handbook”, Prentice Hall, First Edition,2001.
2. AnkitFadia, MnuZacharia, “Intrusion Alert”, Vikas Publishing house Pvt Ltd., Second Edition, 2008.
3. Earl Carter, Jonathan Hogue, “Intrusion Prevention Fundamentals”, Pearson Education, First Edition, 2006.
4. Robert.L. Barnard, “Intrusion detection System”, gulf professional publishing, Second Edition, 1998.

14UIT906	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, 2nd edition, 2001.
2. Ben Sheiderman, “Design The User Interface”, Pearson Education, 5th edition, 1998.

REFERENCE BOOKS:

1. Alan Cooper, “The Essential Of User Interface Design”, Wiley – Dream Tech Ltd., First Edition, 2002.
2. Debbie Stone, Caroline Jarrett, Mark Woodroffe, Shailey Minocha, “User Interface Design and Evaluation (Interactive Technologies)”, Morgan-Kaufmann Publishers, First Edition, 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.

14UIT907	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, First Edition,2004.
2. Gabriele Piccoli,“Information Systems – for managers”, Wiley, First Edition ,2008.

REFERENCE BOOKS:

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

14UIT908	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
- Use grid and cloud tool kits

TEXT BOOKS:

1. Frederic Magoules, Jie Pan, “Introduction to Grid Computing”, CRC Press, First Edition, 2009.
2. Kai Hwang, Geoffery C.Fox and Jack J.Dongarra, “Distributed and Cloud Computing: Clusters, Grids, Clouds and the Future of Internet”, Morgan Kaufman Publisher, an Imprint of Elsevier, First Edition, 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”, O‟ Reilly, First Edition, 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”, Morgan Kaufmann, Second Edition, 1999.

14UIT909	BIG DATA AND 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

- Explain big data and use cases from selected business domains
- Explain NoSQL big data management
- Analyze, Install, configure, and run Hadoop and HDFS.
- Perform map- reduce analytics using Hadoop.
- Apply hadoop related tools such as Hbase, cassandra, pig, and hive for big data analytics.

TEXT BOOKS:

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

REFERENCE BOOKS:

1. Bill Franks,”Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with advanced analytics”, John Wiley & sons, First Edition, 2012.
2. Glenn J.Myatt,” Making Sense of Data”, John Wiley & Sons, First Edition, 2007.
3. Jiawei Han, Micheline Kamber,”Data Mining Concepts and Techniques”, Elsevier, Second Edition, Reprinted 2008.
4. Tom White, ”Hadoop: The Definitive Guide”, O"reilly Media, Third Edition, 2012.

14UIT910	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:

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

- 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.

14UIT911	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
- Identify recent trends in sensor networks

TEXT BOOKS:

1. C. Siva Ram Murthy and, B.S.Manoj, “Adhoc Wireless Networks Architectures and Protocols”, Pearson Education, First Edition,2004.
2. Carlos de Morais Cordeiro, Dharma Prakash Agrawal, Adhoc and Sensor Networks Theory and Applications”, World Scientific Publishing Co Pvt Ltd, Second Edition, 2011.

REFERENCE BOOKS:

1. Feng Zhao, Leonidas Guibas,”Wireless Sensor Networks, Morgan”, Kaufman Publishers, First Edition,2004.
2. C.K.Toh, “Adhoc Mobile Wireless Networks”, Pearson Education, First Edition,2002.
3. Thomas Krag an, Sebast in Buettrich, “Wireless Mesh Networking”, OReilly,Third Edition,2007.
4. Prasant Mohapatra, and Srihanamurthy”,Ad Hoc Networks Technologies and Protocols”, Springer International Edition,2009.

14UIT912	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 MANAGEMENT **9**

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

UNIT V 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. Srinivasan Desikan and Gopalaswamy Ramesh, “Software Testing – Principles and Practices”, Pearson Education, First Edition, 2006.
2. Ilene Burnstein,” Practical Software Testing”, Springer International Edition, Second Edition, 2003.

REFERENCE BOOKS:

1. Ron Patton, “Software Testing”, Sams Publishing, Pearson Education, Second Edition 2007.
2. Edward Kit,” Software Testing in the Real World – Improving the Process”, Pearson Education, First Edition,1995.
3. Boris Beizer,” Software Testing Techniques”, Van Nostrand Reinhold, New York, Second Edition 1990.
4. Aditya P. Mathur, “Foundations of Software Testing Fundamental Algorithms and Techniques”, Dorling Kindersley (India) Pvt. Ltd., Pearson Education, Second Edition,2008.

14UIT913	INTERNET OF EVERYTHING	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To introduce the Vision of IoT.
- To familiarize IoT Market perspective.
- To Use Devices in IoT Technology.
- To Understand State of the Art – IoT Architecture.
- To impart the knowledge of Real World IoT Design Constraints and Applications

UNIT I INTRODUCTION 9

From M2M to IoT - M2M communication - M2M towards IoT - the global context - Game changers - General technology and scientific trends - Trends in information and communications technologies - Implications for IoT - Barriers and concerns - A use case example - Differing characteristics

UNIT II A MARKET PERSPECTIVE 9

Introduction - M2M Value Chains, IoT Value Chains - An emerging industrial structure for IoT - The international driven global value chain and global information monopolies. - An Architectural Overview : Building an architecture - Main design principles and needed capabilities - An IoT architecture outline - standards considerations.

UNIT III IOT TECHNOLOGY FUNDAMENTALS 9

Devices and gateways - Local and wide area networking - Data management - Business processes in IoT - Everything as a Service(XaaS) - M2M and IoT Analytics - Knowledge Management

UNIT IV IOT ARCHITECTURE 9

Introduction - State of the art - Architecture Reference Model – Introduction - Reference Model and architecture - IoT reference Model - IoT Reference Architecture : Introduction - Functional View - Information View - Deployment and Operational View - Other Relevant architectural views

UNIT V REAL-WORLD DESIGN CONSTRAINTS AND APPLICATIONS 9

Introduction - Technical Design constraints - hardware is popular again - Data representation and visualization - Interaction and remote control - The Smart Grid : Smart metering - Smart house - Smart energy city - Commercial Building Automation : Introduction - Case study: phase one- commercial building automation today, Case study: phase two- commercial building automation in the future

TOTAL: 45 PERIODS

COURSE OUTCOMES:

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

- Understand the vision of IoT from a global context
- Determine the Market perspective of IoT
- Use Devices, Gateways and Data Management in IoT
- Build state of the art architecture in IoT.
- Design the solutions for Real world Applications of IoT.

TEXT BOOKS:

1. Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle, “From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence”, 1st Edition, Academic Press, 2014.
2. Arshdeep Bahga, Vijay Madisetti, “Internet of Things – A hands - on approach”, Universities Press, 2015.

REFERENCE BOOKS:

1. Vijay Madisetti and Arshdeep Bahga, “Internet of Things (A Hands-on-Approach)”, 1st Edition, VPT, 2014.
2. Francis daCosta, “Rethinking the Internet of Things: A Scalable Approach to Connecting Everything”, 1st Edition, Apress Publications, 2013.
3. Manoel Carlos Ramon, “Intel® Galileo and Intel® Galileo Gen 2: API Features and Arduino Projects for Linux Programmers”, Apress, 2014.
4. Marco Schwartz, “Internet of Things with the Arduino Yun”, Packt Publishing, 2014.

14UIT914	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
- Design a computer based system to meet desired needs

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

14UIT915	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 a measure of time; distances; reconstruction; distances between species; estimating time intervals 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

- Demonstrate programming skills to provide computational solutions
- Express modern biology and its relationship with informatics
- Discuss various DB technologies with respect to bioinformatics
- Deploy Bioinformatics Algorithms utilizing tools
- Develop Biomolecular and cellular computing applications

TEXT BOOKS:

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

REFERENCE BOOKS:

1. C. Gibas, P. Jambeck,"Developing Bioinformatics Skills", O'Reilly, First Edition, 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.

14UIT916	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.
- Choose the appropriate technique for the efficient utilization of digital resources.

TEXT BOOKS:

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

REFERENCE BOOKS:

1. Abdreas Ulrich Mauthe, Peter Thomas, “Professional Content Management Systems – Handling Digital Media Assets”, John Wiley &Sons, First Edition, 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, First Edition, 2005.
4. Ian H Witten, Alistair Moffat, Timothy C Bell, “Managing Gigabytes”, Academic Press, Second Edition, USA, 1999.

14UIT917	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 – keep alive 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.
- Formulate simple data communication problems

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, Second Edition, 2003.

REFERENCE BOOKS:

1. Forouzan,” TCP/IP protocol suite”, TMH, 2nd edition, 2003.
2. John Ray,” Using TCP/IP”, Prentice Hall of India, Third Edition,1999.

3. W.Richard Stevens," TCP/IP illustrated", Pearson Education, Volume 2,Fourth Edition, 2003.
4. Behrouz A. Forouzan, "TCP/IP Protocol suite", Tata McGraw Hill, Third Edition,2000.

14UIT918	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

- Apply the knowledge of architecture and development tools for FOSS
- Apply reasoning informed by the various deployment tools to assess FOSS
- Select and apply appropriate tools for File handling mechanisms and Graphic file formats
- Design solutions for complex information and communication engineering problems using appropriate text processing tools
- Apply Ethical principles and commit to ethical responsibilities through versioning control, copyright issues and licenses

TEXT BOOKS:

1. M.Tim Jones, “GNU/Linux Application Programming”, Dream Tech Press, First Edition, 2005.
2. Karl Fogel, “Producing Open Source Software”, OReilly Media Inc, First Edition, 2005.

REFERENCE BOOKS:

1. Tom Adelstein, Bill Lubanovic, “Linux System Administration”, OReilly, Fourth Edition, 2007.

2. Richard Petersen, “Red Hat Enterprise Linux 6: Desktop and Administration”, Surfing Turtle Press, First Edition, 2011.
3. Janet Valade, “Spring into Linux”, Pearson Education, First Edition, 2006.
4. Ellie Quigley, “PERL by Example”, Pearson Education, First Edition, OReilly, 2007.

14UIT919	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:

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

- Summarize the concept of semantic web and related applications.
- Classify modelling, aggregating and knowledge representation.
- Categorize web communities in social networks.
- Analyze human behavior and privacy issues.
- Determine the applications of social networks and visualization

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 , First Edition , 2008.
3. Max Chevalier, Christine Julien, Chantal Soule-Dupuy, " Collaborative and Social Information Retrieval and Access: Techniques for Improved user Modelling ", IGI Global Snippet , First Edition , 2009.
4. John G. Breslin, John G. Breslin, StefanDecker, "The Social Semantic Web ", Springer, First Edition , 2009.

14UIT920	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

- Compare various hacking and attacks
- Analyze various vulnerability in network protocols
- Analyze various threat management techniques
- Compare various intrusion detection techniques
- Infer the knowledge of forensic tools

TEXT BOOKS:

1. Kenneth C.Brancik, “Insider Computer Fraud”, Auerbach Publications Taylor & Francis Group, First Edition , 2008.
2. AnkitFadia, “Ethical Hacking”, Macmillan India Ltd, Second edition, 2006.

REFERENCE BOOKS:

1. Johnston, Samuel, “Offensive Defense: The Art of Data War”, Wiley Publishers, First edition, 2010.
2. Krutz R. L, “CEH prep guide the comprehensive guide to certified ethical hacking, Wiley Publishers, First edition, 2008.
3. Mitnick, K. D, “Art of Intrusion: The real stories behind the exploits of hackers, intruders, & deceivers”, Wiley Publishers, First edition, 2005.
4. Sebastopol C.A, “Security power tools”, O'Reilly,First edition, 2007.

14UIT921 DATA MINING CONCEPTS AND TECHNIQUES L T P C

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OBJECTIVES:

- To introduce the fundamentals of data mining and its functionalities
- To familiarize knowledge in different data mining techniques and algorithms
- To review various application domains of data mining

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 DATA MINING 9

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

UNIT III ASSOCIATION RULE MINING AND CLASSIFICATION 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–Data Mining Applications.

UNIT V ADVANCED MINING 9

Web mining, Web content 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 pre processing 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 Micheline Kamber, JianPei, “Data Mining Concepts and Techniques”, Elsevier, 3rd Edition, 2008.
2. AlexBerso, Stephen J.Smith, “Data Warehousing, Data Mining & OLAP”, Tenth Reprint, Tata McGraw–Hil zl Edition, 2007.

REFERENCE BOOKS:

1. Margaret H.Dunham, S.Sridhar, “Data Mining Introductory & Advance Topics”, First Edition,2006.
2. C.S.R.Prabhu, Data Warehousing: Concept, Techniques, Products and Applications” , Prentice Hall of India, Third Edition,2008.
3. Pang-Ning Tan, Michael Steinbach, Vipin Kumar, “Introduction to Data Mining”, Person Education, First Edition, 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.

14UIT922 SATELLITE COMMUNICATIONS AND BROADCASTING

L	T	P	C
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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
- Select a metric to measure the performance of satellite communication systems

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 ",First edition, 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, Third Edition ,2004.
4. Dennis Roddy," Satellite Communications", McGraw Hill, 2nd Edition, 1996.

14UCS902	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 impart the knowledge of Backup and Archive in virtualized and non-virtualized environment

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.

14UEC953	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
- Compare Source coding and Channel coding
- Summarize the efficient data compression scheme for a given information source
- Analyze the 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, First Edition, 2007.
2. Fred Halsall, "Multimedia Communications: Applications, Networks, Protocols and Standards", Pearson Education Asia, First Edition, 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 ,First Edition,2006