VINAYAKA MISSIONS RESEARCH FOUNDATION
(DEEMED TO BE UNIVERSITY)
TAMIL NADU, INDIA

FACULTY OF ENGINEERING & TECHNOLOGY

V.M.K.V. ENGINEERING COLLEGE, SALEM

&

AARUPADAI VEEDU INSTITUTE OF TECHNOLOGY PAIYANOOR, CHENNAI

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

REGULAR - B. E. - COMPUTER SCIENCE & ENGINEERING – 4 Years

CURRICULUM AND SYLLABUS

REGULATION 2015

SEMESTER I

(Applicable to the students admitted from the Academic year 2015-2016 onwards)

Sl No.	Course Title	L	T	P	C	Offering Dept.
THEORY						
1 (Allied core)	Calculus for Engineers	3	1	0	4	MATHS
2 (Allied core)	English for Engineers	3	0	0	3	ENGLISH
3 (Allied core)	Physics for Engineers	3	0	0	3	PHYSICS
4 (Main core)	Essentials of Computer Science and Engineering(Common to all)	3	0	0	3	CSE
5 (Allied core)	Essentials of Civil and Mechanical Engineering	3	0	0	3	CIVIL&MECH
PRACTICAL						
1.	Physics Lab	0	0	4	2	PHYSICS
2.	Computer Lab	0	0	4	2	CSE
3.	Workshop Practice Lab	0	0	4	2	MECH
4.	Yoga and Meditation	0	0	4	2	-

SEMESTER II

(Applicable to the students admitted from the Academic year 2015-2016 onwards)

Sl No.	Course Title	L	T	P	C	Offering Dept.
THEORY						
1 (Allied core)	Transforms and Matrices	3	1	0	4	MATHS
2 (Allied core)	Business English	3	0	0	3	ENGLISH
3 (Allied core)	Chemistry for Engineers	3	0	0	3	CHEMISTRY
4 (Main core)	C Programming (Common to all)	3	0	0	3	CSE
5 (Allied core)	Electronic Devices	3	0	0	3	ECE
PRACTICAL						
1	Chemistry Lab	0	0	4	2	CHEMISTRY
2	C Programming Lab	0	0	4	2	CSE
3	Engineering Graphics	0	0	4	2	MECH
4	Electronic Devices Lab	0	0	4	2	ECE

SEMESTER III

(Applicable to the students admitted from the Academic year 2015-2016 onwards)

Code No.	Course Title	L	T	P	C	Offering Dept.
THEORY						
1 (Allied core)	Numerical Methods, PDE and Applications	3	1	0	4	MATHS
2 (Main core)	Software Engineering	3	0	0	3	CSE
3 (Main core)	Digital Principles and System design	3	0	0	3	ECE
4 (Main core)	Data Structures	3	0	0	3	CSE
5 (Main core)	Object Oriented Programming using C++	3	1	0	4	CSE
6 (Main core)	Database Management System	3	0	0	3	CSE
PRACTICAL						
1	Data Structures Lab	0	0	4	2	CSE
2	Object Oriented Programming Lab	0	0	4	2	CSE
3	Database Management System Lab	0	0	4	2	CSE

SEMESTER IV

(Applicable to the students admitted from the Academic year 2015-2016 onwards)

Code No.	Course Title	L	T	P	C	Offering Dept.
THEORY						
1 (Allied core)	Probability and Queuing Theory	3	1	0	4	MATHS
2 (Main core)	Computer Organization & Architecture	3	0	0	3	CSE
3 (Main core)	System Software	3	1	0	4	CSE
4 (Main core)	Java Programming	3	1	0	4	CSE
5 (Main core)	Operating Systems	3	0	0	3	CSE
6 (Main core)	Computer Networks	3	0	0	3	CSE
PRACTICAL						
1	Java Programming Lab	0	0	4	2	CSE
2	Operating Systems Lab	0	0	4	2	CSE
3	Network Programming Lab	0	0	4	2	CSE
4	Professional Communication & Personality Development Lab	0	0	4	2	ENGLISH

SEMESTER V

(Applicable to the students admitted from the Academic year 2015-2016 onwards)

Code No.	Course Title	L	T	P	C	Offering Dept.
THEORY						
1 (Allied core)	Discrete Mathematics	3	1	0	4	MATHS
2 (Allied core)	Environmental Science and Engineering	3	0	0	3	CHEM
3 (Main core)	Mobile Computing	3	0	0	3	CSE
4 (Main core)	Automata Theory and Compiler Design	3	1	0	4	CSE
5 (Main core)	Web Technology	3	0	0	3	CSE
6 (Main core)	Computer Graphics	3	0	0	3	CSE
PRACTICAL						
1	Compiler Design Lab	0	0	4	2	CSE
2	Web Technology Lab	0	0	4	2	CSE
3	Computer Graphics Lab	0	0	4	2	CSE

SEMESTER VI

(Applicable to the students admitted from the Academic year 2015-2016 onwards)

Code No.	Course Title	L	T	P	C	Offering Dept.
THEORY						
1 (Allied core)	Disaster Mitigation and Management	3	0	0	3	CIVIL
2 (Main core)	Business Intelligence and Applications	3	0	0	3	CSE
3 (Main core)	Artificial Intelligence and Expert Systems	3	1	0	4	CSE
4 (Main core)	Object Oriented Analysis & Design	3	0	0	3	CSE
5(Main core)	Web Based Programming using PHP	3	1	0	4	CSE
6 (Elective)	Elective I	3	0	0	3	CSE
PRACTICAL						
1	Artificial Intelligence and Expert Systems Lab	0	0	4	2	CSE
2	Case Tools Lab	0	0	4	2	CSE
3	PHP Programming Lab	0	0	4	2	CSE

SEMESTER VII

(Applicable to the students admitted from the Academic year 2015-2016 onwards)

Code No.	Course Title	L	T	P	C	Offering Dept.
THEORY						
1 (Main core)	Cyber Security	3	1	0	4	CSE
2 (Main core)	Cloud Computing	3	0	0	3	CSE
3 (Main core)	C# and .NET	3	0	0	3	CSE
4(Main core)	Software Testing	3	0	0	3	CSE
5(Elective)	Elective II	3	0	0	3	CSE
6 (Elective)	Elective III	3	0	0	3	CSE
PRACTICAL						
1	C# &.Net lab	0	0	4	2	CSE
2	Software Testing lab	0	0	4	2	CSE
3	Project I / Mini Project	0	0	6	3	CSE

SEMESTER VIII

(Applicable to the students admitted from the Academic year 2015-2016 onwards)

Code No.	Course Title	L	T	P	C	Offering Dept.
THEORY						
1 (Elective)	Internet of Things	3	0	0	3	CSE
2 (Elective)	Elective – IV	3	0	0	3	CSE
3 (Elective)	Elective – V	3	0	0	3	CSE
PRACTICAL						
1	Project Work	0	0	12	6	CSE

LIST OF ELECTIVES FOR B.E. COMPUTER SCIENCE AND ENGINEERING

Sl. No.	Course Title	L	T	P	C	Offering Dept.
1.	Advanced Database Technology	3	0	0	3	CSE
2.	Advanced Java Programming	3	0	0	3	CSE
3.	Big Data and Analytics	3	0	0	3	CSE
4.	Building Enterprise Application	3	0	0	3	CSE
5.	Cryptography and Network Security	3	0	0	3	CSE
6.	Data Warehousing & Data Mining	3	0	0	3	CSE
7.	Developing Web Applications in .NET	3	0	0	3	CSE
8.	Digital Image Processing	3	0	0	3	CSE
9.	Distributed System	3	0	0	3	CSE
10.	Essentials of Information Technology	3	0	0	3	CSE
11.	Grid Computing	3	0	0	3	CSE
12.	High Speed Networks	3	0	0	3	CSE
13.	Internet and Web Technology	3	0	0	3	CSE
14.	Introduction to Mainframes	3	0	0	3	CSE
15.	Knowledge Based Decision Support Systems	3	0	0	3	CSE
16.	Learning IT Essentials by Doing	3	0	0	3	CSE
17.	Mobile Adhoc Network	3	0	0	3	CSE
18.	Mobile Application Development	3	0	0	3	CSE
19.	Multimedia Mining	3	0	0	3	CSE
20.	Nano Technology	3	0	0	3	CSE
21.	Open Source Systems	3	0	0	3	CSE
22.	Real Time Systems	3	0	0	3	CSE
23.	Soft Computing	3	0	0	3	CSE
24.	Software Quality Management	3	0	0	3	CSE
25.	Systems Modeling and Simulation	3	0	0	3	CSE
26.	TCP / IP Technology	3	0	0	3	CSE
27.	Total Quality Management	3	0	0	3	MGMT
28.	UNIX Internals	3	0	0	3	CSE
29.	User Interface Design	3	0	0	3	CSE
30.	Visual Programming	3	0	0	3	CSE
31.	Wireless and Sensor Networks	3	0	0	3	CSE

SEMESTER I	L	T	P	C
ENGLISH FOR ENGINEERS	3	0	0	3

(For I year BE- common to all branches)
2015-2016 Regulations – First Semester

Aim:

Strengthens the basic LSRW (Listening, Speaking, Reading and Writing) skills.

Comprehension of English Language and Grammar.

OBJECTIVE

To make the students of engineering courses learn English for Effective Communication
To make them competent enough in the use of English in today's global scenario.
To make our Engineering graduates fit for any MNC today.

OUTCOME

It is hoped that the students who are taught the revised Technical Syllabus will be able to communicate in English with case.
This syllabus will enable our U.G Engineering graduates to face any challenges with confidence and they will prove on par with their counterpart anywhere in the globe.

Unit – I

Self introduction - Simulations using E Materials - Whatsapp, Face book, Hiker, Twitter- Effective Communication with Minimum Words - Interpretation of Images and Films - Identify the different parts of speech– Common Errors in English – Scientific Vocabulary, (definition and meaning) - Listening Skills- passive and active listening, Listening to native speakers, , guided note taking - Characteristics of a good listener– Telephonic conversation with dialogue.

Unit – II

Articles - Phonetics (Vowels, Consonants and Diphthongs) – Pronunciation Guidelines – Listening to Indian speakers from different regions, intrusion of mother tongue – Homophones – Homonyms, Note taking and Note making - Difference between Spoken and Written English- Use of appropriate language - Listening and Responding to Video Lectures (Green India, environment, social talks) - Extempore.

Unit – III

Tense forms- Verbal &Non verbal communication – Describing objects – Process Description- Speaking Practice – Paragraph Writing on any given topic (My favourite place, games / Hobbies / School life, etc.) –Types of paragraphs- Telephone Etiquettes.

Unit – IV

Impersonal Passive Voice- Conditional Sentences – Technical &Non technical Report Writing (Attend a technical seminar & submit a report) – News Letters & Editing –Skimming & Scanning - How to Improve Reading Speed – Designing Invitations & Poster Preparation.

Unit – V

Sentence Pattern (SVOCA) - Statement of Comparison - Transcoding – Informal letters - SWOT analysis– Resume Writing- Difference –Bio – data, Resume and CV.

References:

1. Practical English Usage- Michael Swan (III edition), Oxford University Press
2. Grammar Builder- I, II, III, and CambridgeUniversity Press.

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FACULTY OF ENGINEERING AND TECHNOLOGY

REGULATIONS-2015

YEAR	SEMESTER	TITLE OF PAPER	L	T	P	C
I	I	PHYSICS FOR ENGINEERS	3	0	0	3
AIM	To familiarize students with the basic concepts of Physics and their application in Engineering & Technology					
OBJECTIVE	➢ Understanding the importance of Physics in material properties ➢ Understand the properties of crystals and their defects ➢ Understand the significance of laser and its application in technology ➢ Understand the basic principles of fibre optics and its uses ➢ Understand the NDT techniques and its implementation					
Outcome	Students will gain knowledge in the basic concepts of physics which can be applied in Engineering & Technology					

UNIT I –Properties of matter **9**

Elasticity – Hooke's law – Stress-strain diagram - Relationship between three moduli of elasticity (qualitative) - Poisson's ratio – Young's modulus by uniform bending and non-uniform bending – Experimental determination of rigidity modulus – I-shaped girders.

UNIT II – Crystal Physics **9**

Unit cell – Bravais lattice – Miller indices – Calculation of number of atoms per unit cell – atomic radius – coordination number – packing factor for SC, BCC, FCC, HCP structures – Crystal imperfections – point, line, surface and volume defects.

UNIT III – Lasers **9**

Laser characteristics - Stimulated Emission – Population Inversion - Einstein coefficients – Lasing action – Types of Laser – Nd:YAG laser, CO_2laser, GaAs laser – Applications of Laser – Holography – construction and reconstruction of a hologram

UNIT IV – Fibre Optics **9**

Principle and propagation of light in optical fibres – numerical aperture and acceptance angle – types of optical fibres (material, refractive index, mode) – Applications: Fibre optic communication system – fibre optic displacement sensor and pressure sensor.

UNIT V - Non – Destructive Testing **9**

Introduction – Types of NDT - Liquid penetrant method – characteristics of penetrant and developer - ultrasonic flaw detector – Ultrasonic scanning methods - X-ray Radiography: displacement method – X-ray Fluoroscopy.

Total hours : 45

TEXT BOOK

"Engineering Physics", compiled by Department of Physics, Vinayaka Missions University, Salem.

REFERENCE BOOKS

1. Beiser, Arthur, "Concepts of Modern Physics", 5th Ed., McGraw-Hill, 2009.
2. Halliday.D, Resnick.R, Walker.J, Fundamentals of Physics, Wiley & sons, 2013.
3.Gaur R. K. and Gupta S. L., "Engineering Physics", Dhanpat Rai publishers, New Delhi, 2001.
4. Avanadhanulu.M.N., ArunMurthy.T.V.S, Engineering Physics Vol. I, S.Chand, 2014.
5. Rajendran. V, "Engineering Physics", Tata Mc Graw Hill Publication and Co., New Delhi, 2009.

SEMESTER I	L	T	P	C
CALCULUS FOR ENGINEERS	3	1	0	4

Common to BE First Semester

(MECH, ECE, CSE, CSSE, EEE, EIE, CIVIL, IT, MECHT, AERO, ETC & AUTO)

Aim:

- To provide students with mathematical knowledge and skills needed to support their concurrent and subsequent engineering and science studies

Objectives:

The syllabus for the Engineering Mathematics II has been framed catering to the needs of the Engineering students. It is purely applications oriented. To mention a few

- Differential equation plays a vital role in finding the solutions of problems related to oscillations of Mechanical and Electrical systems, bending of beam, conduction of heat, velocity of chemical reaction etc., and as such play an very important role in all modern scientific and engineering studies.
- To improve their ability in solving geometrical applications of differential calculus problems
- To have knowledge in multiple calculus
- To improve their ability in Vector calculus
- The complex functions are useful in the study of Fluid mechanics, Thermodynamics and electric fields

Outcome:

- At the end of this course the students will be in a position to apply the knowledge of Mathematics in the respective Engineering branches.

UNIT I

APPLICATION OF DIFFERENTIAL CALCULUS

Curvature – Cartesian and Parametric Co-ordinates – Centre and radius of curvature – Circle of curvature – Evolute

UNIT II

FUNCTIONS OF SEVERAL VARIABLES

Partial Derivatives – Total Differential - Maxima and Minima – constrained Maxima and Minima by Lagrangian Multiplier Method.

UNIT III

INTEGRATION

Concept of integration-Integration of Rational andTrigonometric functions – Using Partial Fractions – Integration by parts.

UNIT IV

MULTIPLE INTEGRAL

Double integration –change of order of integration- Cartesian and polar coordinates – Area as a double integral – Triple integration.

UNIT V

VECTOR CALCULUS

Directional derivatives – Gradient, Divergence and Curl – Irrotational and solenoidal-vector
fields – Vector integration – Green‟s theorem, Gauss divergence theorem and Stoke‟s theorem (excluding proof).

TEXT BOOK:

1. **"**Engineering Mathematics**"** by Department of Mathematics, VMU
2. Veerarajan, T., "Engineering Mathematics", Tata McGraw Hill Publishing Co., NewDelhi, 2006.
3. Dr.A .Singaravelu , Engineering Mathematics Volume I & Volume II by Meenakshi Publications.

REFERENCES:

1. Grewal, B.S., "Higher Engineering Mathematics" (36th Edition), Khanna Publishers, Delhi 2001.
2. Kreyszig, E., "Advanced Engineering Mathematics" (8th Edition), John Wiley and Sons (Asia) Pvt Ltd., Singapore, 2001.
3. Kandasamy .P., Thilagavathy. K., and Gunavathy. K., "Engineering Mathematics",
   Volumes I & II (4th edition), S.Chand& Co., New Delhi., 2001.
4. T. Veerarajan, "Engineering Mathematics" (for semester III), Third Edition Tata McGraw- Hill Publishing Company limited.

SEMESTER I	L	T	P	C
ESSENTIALS OF COMPUTER SCIENCE AND ENGINEERING	3	0	0	3

(Common for All Branches)

AIM:

The aim is to introduce the fundamentals of Computer to the students

OBJECTIVES:

- To provide basic knowledge on hardware and software components of computers.
- To introduce and demonstrate various software applications
- To introduce Problem solving methodologies
- To learn about Implementation of Algorithms
- To learn about HTML

OUTCOME

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

Do Problem Solving using Programming and algorithms, Describe working of Internet based applications, Document artifacts using common quality standards, Design simple data store using DBMS concepts and implement, Develop a working website with all above learning

UNIT I - Basics of Computer and Information Technology **10**

Computer – Generations, Types of Computers, Block diagram of a computer- Components of a computer system - Hardware and software definitions - Categories of software – Booting - Installing and Uninstalling a Software - Software piracy - Software terminologies - Applications of Computer - Role of Information Technology - History of Internet - Internet Services.

UNIT II - Software Applications (Practical Learning) **7**

Office Automation: Application Packages - Word processing (MS Word) - Spread sheet (MS Excel) – Presentation (MS PowerPoint).

UNIT III - Problem Solving Methodologies **10**

Problems Solving Techniques - Program Development Cycle – Algorithm Development - Flow chart generation –Programming Constructs (Sequential, Decision-Making, Iteration) - Types and generation of programming languages

UNIT IV Implementation of Algorithms **9**

Implementation of Algorithms-program verification-The efficiency of algorithms-The analysis of algorithms-Fundamental Algorithms

UNIT V HTML **9**

Basics of HTML – Applications of HTML – HTML Fonts – anchor tag and its attributes – Using images in HTML programs – list tag - Table tag – HTML forms

TOTAL HOURS: 45

TEXT BOOKS

1. *Essentials of Computer Science and Engineering – by VMU*

SEMESTER I	L	T	P	C
ESSENTIALS OF CIVIL AND MECHANICAL ENGINEERING	3	0	0	3

Aim

To familiarize students with the basic concepts of Civil and Mechanical in Engineering & Technology

OBJECTIVE

To make the students of other branches other than mechanical to have knowledge about surveying and material used in civil engineering for the construction of building and the various forces that may cost stress and strain to the component of the structure

The make the students to be aware of the various types of power plants and working of various components in the power plants, working of IC engines, Principle of refrigeration, Air conditioning and equipments related to that field.

These are essential for the students to be aware of the systems that are used for safe and comfort living.

OUTCOME

The students would be well aware about the surveying, material used in construction of building and comforts provided to the buildings by Air conditioning and about the IC engines which are used generate power and run automobiles.

A - CIVIL ENGINEERING

UNIT I SURVEYING AND CIVIL ENGINEERING MATERIALS 9

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

Civil Engineering Materials: Bricks – stones – sand – cement – concrete – steel sections.

UNIT II BUILDING COMPONENTS AND STRUCTURES 9

Foundations: Types – Requirement of good foundations. Superstructure: Brick masonry – stone masonry – beams – columns – lintels – roofing – flooring – plastering – Types of Bridges and Dams

B – MECHANICAL ENGINEERING

UNIT III ENERGY SOURCES9

Introduction, Classification of Power Plants – Working principle of steam, Diesel, Hydro and Nuclear Power plants – Merits and Demerits – Introduction to Renewable Energy Sources

UNIT IV IC ENGINES & REFRIGERATION AND AIR CONDITIONING SYSTEM 9

Internal combustion engines – Working principle of Petrol and Diesel Engines – Four stroke and two stroke cycles – Comparison of four stroke and two stroke engines.

Basic Terminology of Refrigeration and Air Conditioning-Principle of vapour compression and absorption system.

UNIT V BASIC MANUFACTURING PROCESSES **9**

Casting process-Introduction, Principle, Advantages, casting defects
Forging process-introduction, forging, rolling, drawing, extrusion
Welding process- introduction, principle, types-Gas and arc welding

TOTAL: 45 PERIODS

REFERENCES:

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

PRACTICALS

VINAYAKA MISSIONS UNIVERSITY, SALEM

FACULTY OF ENGINEERING AND TECHNOLOGY

REGULATIONS-2015

YEAR	SEMESTER	TITLE OF PAPER	L	T	P	C
I	I	PHYSICS LAB (REAL & VIRTUAL)	0	0	4	2
AIM	To familiarize students with the basic concepts of Physics and theirapplication in Engineering & Technology through experiments					
OBJECTIVE	➢ Understanding the experiments through online virtual demonstration followed by real hands-on experience					
OUTCOME	The students will be enabled in taking measurements and calculating the physical parameters.					

List of Experiments

1. Young's modulus of a bar - Non-uniform bending
2. Rigidity modulus of a wire - Torsional Pendulum
3. Viscosity of a liquid - Poiseuille's method
4. Velocity of ultrasonic waves in liquids - Ultrasonic Interferometer
5. Particle size determination using Laser
6. Wavelength of spectral lines – grating - Spectrometer
7. Thickness of a wire - Air wedge Method
8. Thermal conductivity of a bad conductor - Lee's disc
9. Band gap determination of a thermistor - Post Office Box
10. Specific resistance of a wire – Potentiometer

SEMESTER I	L	T	P	C
WORKSHOP PRACTICES	0	0	3	2

(Common to all Branches - Except Bio-Tech & Bio info)

AIM

The aim of the lab to learn Business fitting, Carpentry and welding technics.

OBJECTIVE

To learn the experience of practice in basic sections of the workshop namely fitting, Carpentry and welding in order to know the various methods involved in making parts of the various machines.

OUTCOME

The students would have been completely exposed to the various basic methods that are going to play in the manufacture of even very heavy machines.

FITTING

1. Square Joint
2. Dove Tail Joint

CARPENTRY

1. Half Lap Joint
2. Dove Tail Joint

WELDING

1. Arc Welding of butt Joint.
2. Arc Welding of Lap Joint

CASTING

1. Foundry – Mould Preparation using single piece pattern

DEMONSTRATION

1. Sheet Metal – Fabrication of cone
2. Black Smithy – Round to square rod

Reference:

1."Basic Workshop Practice", Department of Mechanical Engineering, VinayakaMissionsUniversity

SEMESTER I	L	T	P	C
COMPUTER LAB	0	0	3	2

(Common for all branches)

AIM

To practice the basics of office automation application, SQL and basic HTML coding

OBJECTIVE

To familiarize students with the basic tools of computer and their application in engineering & technology

OUTCOME

At the end of the course, the students would have develop their skills for Office automation, SQL queries and Html

1. Implement Mail Merge in MS-Word and send letters to parents regarding the semester fee structure of the student.
2. Using MS-Word, create a leave letter addressed to your faculty advisor
3. A) Using MS-Word, create a table for a list of students with different font sizes and colours
   B) Using MS-Word, create a flow-chart using the basic shapes available. Use page border, a watermark, header and footer
4. Using MS-PowerPoint, create a presentation about the university
5. Using MS-PowerPoint, create a story line with various animations and transition effects.
6. Using MS-Excel, Analyze Students performance using MS-Excel and prepare a chart type report.
7. Using MS-Excel, create a pivot table
8. Using MS-Excel, create look-up tables
9. Using MS-Excel, create graphs for the weather condition in various cities of India
10. Create an HTML page Create an HTML page to
    a) Click on a link and go to the bottom of the page using <a href>
    b) Display an image.
11. Create an HTML page to
    a) Display ordered and unordered lists of your friends names and sports persons
    b) Display a table with 3 columns and 4 rows.

SEMESTER II	L	T	P	C
BUSINESS ENGLISH	3	0	0	3

(For I year BE, Common to all branches)
2015 - 2016 Regulations – Second Semester

Aim

To familiarize students with the basic grammar and learn corporate communication for develop the business knowledge.

OBJECTIVE

To make the students understand the principles of Basic English grammar and use it in their day to day life.
To make the Engineering graduates employable and industry ready.
To make our students that they are second to none in the best use of the English language.

OUTCOME

By teaching this syllabus, it is believed that the UG Engineering graduates will develop their fluency level of using English.
Students, who undergo this syllabus, will fulfill the expectations of the industries and find themselves employable in any field.

Unit – I

Subject and verb agreement (Concord) – Preposition and Relative Pronoun – Cause and effect- Phrasal Verbs – Idioms and Phrases – Listening comprehension - Listening to Audio Files and Answering Questions – Framing Questions – Negotiation skills, Persuasion Skills and Debating skills.

Unit – II

Stress (Word stress and Sentence stress) – Intonation – Difference between British and American English– Vocabulary – Indianism - Compound Words(including technical terminology).

Unit – III

Reading Skills – Understanding ideas and making inferences – Group Discussion – Types of Interviews, FAQs – e- mail Netiquette, Sample e-mails – Watching Documentary Films and responding to questions.

Unit – IV

Corporate communication – Recommendation - Instruction – Check List- circulars- Inter office memo – Minutes of meeting and Writing agenda – Discourse Markers- Rearranging the jumbled sentences – Technical Articles – Project Proposals, Making Presentations on given topics – Preparing Power Point Presentations.

Unit – V

Critical Reading – Book Review - Finding Key Information and Sifting Facts from Opinions – Business letters (Calling for Quotation, Placing orders and Complaint letters) – Expansion of an Idea. – Creative Writing.

References:

1. Grammar Builder- I, II, III -CambridgeUniversity Press.

Technical English-Writing, Reading and Speaking- Pickett and Lester, Harper and Row publication

SEMESTER II	L	T	P	C
CHEMISTRY FOR ENGINEERS	3	0	0	3

(Common to all branches exceptBiotechnology)
B.E / B.Tech. - SECOND SEMESTER –CBCS regulations 2015

Aim

To impart in basic knowledge in chemistry so that the student will understand the engineering concept and they can face the competitive examinations effectively.

OBJECTIVE

With a solid foundation in basic scientific and engineering principles, while allowing specialization in Engineering chemistry and ability to assess the impact of engineering solutions in a global and societal context.

OUTCOME

The student will come out with the ability to assess the impact of engineering solutions.

UNIT I : ELECTROCHEMISTRY, BATTERIES AND FUEL CELLS 9 Hrs

Ostwald Law and Debye Huckle's law - Electrode potential -Nernst equation – Electrodes (SHE, Calomel and Glass)- cells - EMF measurement-emf and galvanic series.

Primary battery (Daniel and dry cell) – secondary battery (lead Acid storage battery and Nickel-Cadmium battery) – Fuel cell (H_2-O_2 fuel cell)

UNIT II : WATER TECHNOLOGY & CORROSION 9 Hrs

Sources of water – impurities – Hardness and its determination (problems to be avoided) – boiler troubles – water softening (zeolite & Demineralisation) – Domestic water treatment – Desalination (Electrodialysis& Reverse Osmosis).

Corrosion – Types – principles – corrosion control methods (Electroplating,Electroless plating, Sacrificial anode and Impressed current method).

UNIT III: CHEMISTRY OF ADVANCED MATERIALS 9 Hrs

Refractories – properties and uses, Portland cement –manufacturing, setting and hardening – Special cement, ceramics.

Organic electronic material, shape memory alloys, smart materials,polymers(PVC,Teflon, Bakelite)-fibers(optical fibre)& composites (FRP,MMC & PMC)

UNIT IV : PHASE EQUILIBRIA & NUCLEAR CHEMISTRY 9 Hrs

Phase rule: statement and explanation of terms involved – One component system (water) – Condensed phase rule – Two component system (Lead-silver) .

Nuclear Chemistry – Fission – Fusion – working of nuclear reactor – Radiations and harmful effects.

UNIT V : CHROMATOGRAPHY AND SPECTROSCOPY 9 Hrs

Chromatography — classification (Paper, Column, Thin Layer, Gas, HPLC). Principle and applications.

Spectroscopy – Electromagnetic radiation – Beer Lambert's law – UV – Visible – IR – Atomic absorption & flame emission spectroscopy (Principle,Instrumentation, block diagram).

TEXT BOOK: Engineering Chemistry by VMU.

References:

1. A text book of Engineering Chemistry by S.S. Dara, S.Chand& company Ltd., New Delhi

2. Engineering Chemistry by Jain & Jain, 15th edition Dhanpatrai Publishing Company (P)Ltd.,New Delhi
3. A text book of Engineering Chemistry by Shashi Chawla,Edition 2012Dhanpatrai& Co., New Delhi.
4. Engineering Chemistry by Dr.A.Ravikrishnan,Sri Krishna Publications, Chennai

SEMESTER II	L	T	P	C
TRANSFORMS AND MATRICES	3	1	0	4

Common to BE - Second Semester

(MECH, ECE, CSE, CSSE, EEE, EIE, CIVIL, IT, MECHT, AERO, ETC & AUTO)

Aim:

- To provide students with mathematical knowledge and skills needed to support their concurrent and subsequent engineering and science studies

Objectives:

The syllabus for the Engineering Mathematics I have been framed catering to the needs of the Engineering students. It is purely applications oriented. To mention a few

- To utilize the powerful features of MATLAB one has to be an expert in Matrix theory
- The matrix theory plays a vital role in simplifying large arrays of equation and in determining their solution.
- Partial differential equation frequently occurred in the theory of elasticity and Hydraulics.
- In circuit branches the current flow can be calculated by using Laplace transform when EMF, resistance and inductions are known.

Outcome:

- At the end of this course the students will be in a position to apply the knowledge of Mathematics in the respective Engineering branches.

UNIT IMATRICES

Characteristic equation – Eigen values and eigenvectors of a real matrix – Properties of eigenvalues and eigenvectors (Without proof) – Cayley-Hamilton theorem (excluding proof) – Orthogonal transformation of a symmetric matrix to diagonal form.

UNIT IILAPLACE TRANSFORMS

Laplace transform – transform of elementary functions – basic properties – derivatives and integrals of transforms – transforms of derivatives and integrals – initial and final value theorems – Transform of periodic functions.

UNIT IIIINVERSE LAPLACE TRANSFORMS & APPLICATIONS

Inverse Laplace transform – Convolution theorem – Initial and Final value theorem- Solution of linear ODE of second order with constant coefficients and first order simultaneous equation with constant coefficients using Laplace transforms.

UNIT IVFOURIER TRANSFORMS

Fourier transform pairs - Fourier Sine and Cosine transforms – Properties - Transforms of simple functions - Convolution theorem - Parseval's identity.

UNIT VZ-TRANSFORMS

Z-Transform – Elementary Properties – Inverse Z-Transform – Convolution Theorem – Formation of Difference Equations – Solution of Difference Equations using Z-Transform.

TEXT BOOKS

1. **"**Engineering Mathematics**"** by Department of Mathematics, VMU
2. Veerarajan, T., "Engineering Mathematics", Tata McGraw Hill Publishing Co., NewDelhi, 2006.
3. Dr.A .Singaravelu , Engineering Mathematics Volume I & Volume II by Meenakshi Publications.
4. A.Singaravelu,"Transforms and Partial Differential Equations", Meenakshi Agencies,Chennai

REFERENCE BOOKS

1. Grewal, B.S., "Higher Engineering Mathematics" (36th Edition), Khanna Publishers,Delhi 2001.
2. Kreyszig, E., "Advanced Engineering Mathematics" (8th Edition), John Wiley and Sons (Asia) Pvt Ltd., Singapore, 2001.
3. Kandasamy .P., Thilagavathy. K., and Gunavathy. K., "Engineering Mathematics",Volumes I,II& III (4th edition), S.Chand& Co., New Delhi., 2001

SEMESTER II	L	T	P	C
C PROGRAMMING	3	0	0	3

(Common for All Branches)

AIM:

The aim is to introduce C programming to the students.

OBJECTIVES:

- To introduce Basics of C
- To understand Control Structures & Arrays
- To learn about String concept, Structure and Union in C
- To introduce the concepts of Functions and Pointers
- To introduce Memory and File management concepts in C

OUTCOME

At the end of this course, student shall be able to know the concepts of C programming techniques.

UNIT I - Basics of C **9**

Identifiers, variables, expression, keywords, data types, constants, scope of variables. Operators: arithmetic, logical, relational, conditional and bitwise operators - Special operators: size of () & comma (,) operator - Precedence and associatively of operators - Type conversion in expressions.

UNIT II - Control Structures & Arrays **9**

Basic input/output and library functions: Single character input/output i.e. getch(), getchar(), getche(), putchar() - Formatted input/output: printf() and scanf() – Library functions (mathematical and character functions). Decision Making and Branching – Looping statements. Arrays – Initialization – Declaration – One dimensional and two dimensional arrays.

UNIT III String, Structure & Union **9**

Strings: Declaration-Initialization and string handling functions. Structure and Union: structure declaration and definition – Accessing a Structure variable – Structure within a structure – Union.

UNIT IV Functions and Pointers **9**

Function –Function Declaration–function definition- Pass by value – Pass by reference – Recursive function – Pointers - Definition – Initialization – & and * operators - Pointer to functions-Function returning pointers – Pointers and arrays

UNIT V Memory and File management **9**

Static and dynamic memory allocation - Storage class specifier - Preprocessor directives. File handling concepts – File read – write- Functions for file manipulation: fopen, fclose, gets, puts, fprintf, fscan, getw, putw, fputs, fgets, fread, fwrite - Random access to files: fseek, ftell, rewind - File name as Command Line Argument.

TOTAL HOURS: 45

TEXT BOOKS:

1. Balaguruswami.E, “Programming in C”, TMH Publications,1997

REFERENCE BOOKS:

1. Behrouz A. Forouzan& Richard F. Gilberg, “Computer Science A Structured Programming using C”, Cengage Learning, 3rd Edition, 2007

2. Gottfried , “Programming with C”, schaums outline series, TMH publications,1997

3. Mahapatra , “Thinking in C”, PHI publications, 2nd Edition, 1998.

4. Subbura.R , “Programming in C” , Vikas publishing, 1st Edition, 2000

SEMESTER II	L	T	P	C
ELECTRONIC DEVICES	3	0	0	3

AIM

To develop the students for handle and work on all major Electronic devices .

OBJECTIVE

The application of electrical energy in machines like DC machines, transformers, AC machines etc brings the utility of Electrical energy in various devices.

To enable the student to learn the major components of a electronic system

To know the correct and efficient ways of knowing various electronic gadgets

OUTCOME

An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

This course provides comprehensive idea about electronic components, working principles of devices and applications.

UNIT I-SEMICONDUCTOR DIODES AND SPECIAL PURPOSE DIODES (10 hours)

Overview on Physics and Properties of Semiconductors: Intrinsic semiconductor – extrinsic semiconductor – Fermi level in an intrinsic semiconductor – conductivity of a metal, intrinsic semiconductor and extrinsic semiconductor – drift – diffusion – recombination – carrier life time. Semiconductor diodes: Formation of PN junction – working principle – VI characteristics – Zener Diode – VI characteristics.

UNIT II-BIPOLAR TRANSISTORS (6 hours)

Bipolar Transistors: Construction – working – transistor currents – transistor configurations and input-output characteristics – Early effect (basewidth modulation) – Ebers Moll model – transistor as an amplifier – Transistor as a switch

UNIT III-FIELD-EFFECT TRANSISTORS (8 hours)

Field-Effect Transistors : construction, working and VI characteristics of JFET – comparison of BJT and JFET – MOSFET – enhancement MOSFET, depletion MOSFET, their working principle and VI characteristics, comparison of MOSFET with JFET, comparison of D MOSFET with E MOSFET, CMOS, MESFET, CCD.

UNIT IV-DC POWER SUPPLIES (12 hours)

Rectifiers and Filters : Block schematic of a typical DC power supply, single phase HWR, FWR, full-wave bridge rectifier, power supply filters (ripple factor and efficiency analysis), bleeder resistor, voltage dividers
Voltage regulators: voltage regulation, zener diode shunt regulator, transistor series regulator, transistor shunt regulator, switching regulators, design of complete DC power supply circuit.

UNITV-INTEGRATED CIRCUIT FABRICATION (9 hours)

Integrated circuit – advantages and drawback of ICs – scale of integration – classification of ICs – definition of linear IC and digital IC with examples – manufacturing process of monolithic ICs – fabrication of components (diode, capacitor, bipolar transistor, resistor and field – effect transistor) on monolithic IC – comparison of MOS ICs and bipolar ICs.

TEXT BOOKS

1. Robert L. Boylestad and Louis Nashelsky, “Electronic Devices and Circuit Theory”, Pearson Education, 9th Edition, 2009.
2. B. Somanathan Nair, “Electronic Devices and Applications”, PHI, 2006

REFERENCES

1. Jacob Millman, Christos C Halkias, Satyabrata Jit, “Electron Devices and Circuits”, Tata McGraw Hill, 2010.

2. David A Bell, “Fundamentals of Electronic Devices and Circuits”, Oxford Press, 2009. 3. B L Theraja, R S Sedha, “Principles of Electronic Devices and Circuits”, S.Chand, 2004

PRACTICALS

SEMESTER II	L	T	P	C
ENGINEERING CHEMISTRY LAB	0	0	3	2

(REAL & VIRTUAL)
(Common to all branches exceptBiotechnology)
B.E / B.Tech. - SECOND SEMESTER –CBCS regulations 2015

AIM

To impart in basic knowledge in chemistry so that the student will understand the engineering concept.

To improve the knowledge in the instrument applications.

OBJECTIVE

To learn the relevant experience using laboratory experiments

OUTCOME

The student will have the experience in handling the instruments relevant to his/her theory.

1. Estimation of total hardness of water sample by EDTA method.
2. Estimation of dissolved oxygen by Winkler's method.
3. Estimation of ferrous ion by Potentiometry.
4. Precipitation reaction by Conductometry.
5. Acid base reaction by pH metry.
6. Estimation of copper from its ore.
7. Estimation of iron by spectrophotometer.
8. Estimation of sodium by flame photometer.
9. Separation of mixture of components using thin layer chromatography.
10. Corrosion experiment by weight loss methos.

SEMESTER II	L	T	P	C
ENGINEERING GRAPHICS LAB	0	0	3	2

(Common to ALL BRANCHES EXCEPT BIOTECH,BIO-INFO)

AIM: -

AN INTRODUCTION OF CAD SOFTWARE AND ITS UTILITIES IN ENGINEERING FIELDS. **COURSE**

OBJECTIVES:

1. To improve imagination skills.
2. Increase ability to communicate with people.
3. Learn to sketch and take field dimensions.
4. Learn to take data and transform it into graphic drawings.
5. Learn basic engineering drawing formats.
6. Prepare the student for future Engineering positions.

COURSE OUTCOMES:

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

1. Get acquainted with the knowledge of various lines, geometrical constructions and construction of various kinds of scales, and Ellipse.
2. Improve their imagination skills by gaining knowledge about points, lines and planes.
3. Become proficient in drawing the projections of various solids. 4. Gain knowledge about orthographic and isometric projections.

Concepts and conventions (Not for Examination)

Importance of graphics in engineering applications – Use of drafting instruments – BIS conventions and specifications – Size, layout and folding of drawing sheets – Lettering and dimensioning.

UNIT I PLANE CURVES AND FREE HAND SKETCHING 9

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

UNIT II PROJECTION OF POINTS, LINES 9

Projection of points, Projection of straight lines located in the first quadrant: inclined to both planes – Determination of true lengths and true inclinations – rotating line method only.

UNIT III PROJECTION OF SOLIDS 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 IV SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES 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 V ISOMETRIC VIEW AND PERSPECTIVE PROJECTION 9

Principles of isometric View – isometric scale – isometric view of simple solids- Introduction to Perspective projection

TEXT BOOKS:

1. N.D. Bhatt, "Engineering Drawing" Charotar Publishing House, 46th Edition, (2003).
2. K. V. Natarajan, "A text book of Engineering Graphics", Dhanalakshmi Publishers, Chennai (2006).

REFERENCES:

1. M.S. Kumar, "Engineering Graphics", D.D. Publications, (2007).
2. K. Venugopal & V. Prabhu Raja, "Engineering Graphics", New Age International (P) Limited (2008).
3. M.B. Shah and B.C. Rana, "Engineering Drawing", Pearson Education (2005).
4. K. R. Gopalakrishnana, "Engineering Drawing" (Vol.I&II), Subhas Publications (1998).
5. Dhananjay A.Jolhe, "Engineering Drawing with an introduction to AutoCAD"Tata McGraw Hill Publishing Company Limited (2008).
6. Basant Agarwal and Agarwal C.M., "Engineering Drawing", Tata McGraw Hill Publishing Company Limited, New Delhi, (2008).

SEMESTER II	L	T	P	C
C PROGRAMMING LAB	0	0	3	2

(Common for All Branches)

AIM

To practice and develop applications using C Programming languages.

OBJECTIVE

To make the students to develop program in C languages.

OUTCOME

At the end of the course, the students will be able to develop applications using C Programming languages.

1. Write a C Program to Implementation of Sine and cosine series
2. Write a C Program to calculate Simple Interest
3. Write a C Program to generate Fibonacci Series using for loop
4. Write a C program to calculate factorial using while loop
5. Write a C Program to
   a) Find the greatest of three numbers using if condition.
   b) Find the greatest of three numbers using conditional operator.
6. Write a C program for finding the roots of a given quadratic equation using conditional control statements
7. Write a C program to
   a) Compute matrix multiplication using the concept of arrays.
   b) Illustrate the concept of string handling functions.
8. Write a C program to
   a) Find the largest element in an array using pointers.
   b) Convert a binary number to decimal or decimal to binary using functions.
9. Write a C program to read data from keyboard, write it to a file named student again read the same data from student file and write it into data file.
10. Write a C program to store employee details using the concept of structures.

SEMESTER II	L	T	P	C
ELECTRONIC DEVICES LAB	0	0	3	2

AIM

To practice and know functions of major Electronic devices.

OBJECTIVE

To provide exposure to the students with hands on experience on basic Engineering practices of Electronics Engineering.

OUTCOME

Understanding the basic concepts and the working principle, construction and applications of electronic devices and gadgets.

List of Experiments

1. Characteristics of PN junction Diode.
2. Characteristics of Zener diode.
3. Input, Output characteristics of CE Amplifier.
4. Input, Output characteristics of CC Amplifier.
5. Transfer characteristics of JFET.
6. Input, Output characteristics of UJT
7. Half wave rectifier.
8. Full wave rectifier.
9. Voltage Regulator.
10. Simulation experiments using PSPICE.

SEMESTER-III

NUMERICAL METHODS, PDE AND APPLICATIONS

L	T	P	C
3	1	0	4

Aim:

To provide students with mathematical knowledge and skills needed to support their concurrent and subsequent engineering and science studies

Objectives:

- To provide the knowledge in solving different types of equations.
- To apply appropriate numerical methods to solve a linear system of equations
- To provide the students with the concept and an understanding of Differential equations.
- To orient the students to know about the application of Harmonic analysis.
- To teach the students about the solutions of wave and heat equations.
- To motivate the students to know about the applications of Fourier Series
- To impart basic understanding about representation of numbers in different bases in computer and compute numerical solution for algebraic equations

Outcomes:

- Produce numerical solution for transcendental equations in engineering fields.
- Illustrate the interpolation techniques in other branches
- Analyze the spectral characteristics of continuous time periodic and periodic signals using Fourier series.
- Apply the knowledge gathered in the subject to Signal processing
- Gain the knowledge in vibrations of stretched strings.
- Develop the fundamental ideas of D Alembert's solution of the wave equation
- Understand the concepts of Steady state conditions

UNIT-I **12**

SOLUTION OF EQUATIONS

Method of false position, Newton-Raphson method for single variable, Solutions of a linear system by Gaussian, Gauss-Jordan, Jacobian and Gauss- Seidel methods. Inverse of a matrix by Gauss-Jordan method.

UNIT-II **12**

INTERPOLATION AND APPROXIMATION

Interpolation with Newton's divided differences, Lagrange's polynomial, Newton forward and backward differences, central difference Formula (Stirling's and Bessel's).

UNIT-III **12**

PARTIAL DIFFERENTIAL EQUATIONS

Formation - Solutions of standard types f(p,q)=0, clairauts form, f(z,p,q)=0, f(p,x)=g(q,y) of first order equations - Lagrange's Linear equation - Linear partial differential equations of second and higher order with constant coefficients.

UNIT-IV **12**

FOURIER SERIES

Dirichlet's conditions - General Fourier series - Half-range Sine and Cosine series - Parseval's identity – Harmonic Analysis.

UNIT-V **12**

BOUNDARY VALUE PROBLEMS

Classification of second order linear partial differential equations - Solutions of one - dimensional wave equation, one-dimensional heat equation - Steady state solution of two-dimensional heat equation - Fourier series solutions in Cartesian coordinates.

Lecture Hours: 45

Tutorial Hours: 15

Total hours : 60

TEXT BOOK

5. Kandasamy .P.,Thilagavathy. K., and Gunavathy. K., “Engineering Mathematics”, Volumes III (4th edition), S.Chand& Co., New Delhi.
6. A. Singaravelu ,”Numerical Methods” , Meenakshi Agency, Chennai

REFERENCES

1. B.S.Grewal,”Higher Engineering Mathematics”KhannaPublishers,New Delhi.
2. T.Veerarajan, T.Ramachandran, “ Numerical Methods with Programs in C and C++”, Tata McGraw-Hill (2004).

SEMESTER-III

SOFTWARE ENGINEERING

L	T	P	C
3	0	0	3

AIM

The course is intended to give Software Engineering principles in classical sense.

OBJECTIVES

- To be aware of generic models to structure the software development process.
- To understand fundamental concepts of requirements engineering and requirements specification.
- To understand different notion of complexity at both the module and system level.
- To be aware of some widely known design methods.
- To understand the role and contents of testing activities in different life cycle phases.

OUTCOMES

- Identify and build an appropriate process model for a given project
- Analyze the principles at various phases of software development
- Translate specifications into design, and identify the components to build the architecture for a given problem, all using an appropriate software engineering methodology
- Define a Project Management Plan and tabulate appropriate Testing Plans at different levels during the development of the software
- Understand the software project estimation models and estimate the work to be done, resources required and the schedule for a software project

UNIT I SOFTWARE PROCESS 9

Introduction – S/W Engineering paradigm -SDLC– Software Process – Linear Sequential Model-Prototyping Model-RAD Model-Evolutionary Software Process Models-Component Based Development.

UNIT II SOFTWARE PROJECT PLANNING & REQUIREMENTS 9

Project Planning Objectives – Software Scope – Resources – Software Project Estimation – Empirical Estimation Models – Make/Buy Decision-Functional and Non Functional requirements –software requirement specification (SRS) – Requirement Engineering process-Feasibility studies.

UNIT III ANALYSIS, ARCHITECTURE, DESIGN CONCEPTS 9

System Engineering-Analysis Concepts - Design Process & concepts – Design Principles –Effective Modular Design – Design Heuristics– Design Model – The status of software Architecture-Architecture Styles-case Study: Keyword in context- Software Design Description (SDD).

UNIT IV SOFTWARE IMPLEMENTATION & QUALITY ASSURANCE 9

Structured coding Techniques-Coding Styles-Standards and Guidelines- Software testing Fundamentals-Types of testing - Quality Concepts – Quality Movement - Software Quality Assurance – Software

Reviews — Formal Approaches to SQA - Software Reliability – ISO 9000 Quality Standards – SQA Plan.

UNIT V SOFTWARE CONFIGURATION MANAGEMENT 9

Introduction about software configuration management – the SCM process –identification of objects in the software configuration – version control – change control – configuration audit – status reporting – SCM standards –software Documentation-seven rules for sound documentation.

TOTAL HOURS: 45

TEXT BOOKS

1.Roger S. Pressman, "Software Engineering – A practitioner's Approach", Fifth Edition, McGraw-Hill International Edition, 2005.

2.Ian sommerville ," Software Engineering ", Seventh Edition, Pearson Education Asia, 2007.

3.Mary Shaw, David Garlan,"Software Architecture- a perspectives on an Emerging Discipline

REFERENCES

1. WattsS.Humphrey,"A Discipline for Software Engineering", Pearson Education, 2007.

2.James F.Peters and WitoldPedrycz,"Software Engineering, An Engineering Approach", Riley-India, 2007.

SEMESTER-III

DIGITAL PRINCIPLES AND SYSTEM DESIGN

L	T	P	C
3	0	0	3

AIM

The course is intended to give basic Ideas on Digital Principles and System Design.

OBJECTIVES

- Learn how to design digital circuits, by simplifying the Boolean functions. Also, gives an idea about designs using PLDs, and writing codes for designing larger digital systems.

OUTCOME:

- Students understood the concepts of logic gates and CMOS technology.
- Students were able to identify the problem formulation and design of combinational circuits.
- Analyzed about the design of flipflops and counter circuits.
- Students realized the hazards and pulse mode sequential circuits.

UNIT I BOOLEAN ALGEBRA AND LOGIC GATES 9

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

UNIT II COMBINATIONAL LOGIC 9

Combinational Circuits – Analysis and Design Procedures – Circuits for Arithmetic Operations, Code Conversion – Decoders and Encoders – Multiplexers and Demultiplexers – Introduction to HDL – HDL Models of Combinational circuits.

UNIT III SYNCHRONOUS SEQUENTIAL LOGIC 9

Sequential Circuits – Latches and Flip Flops – Analysis and Design Procedures – State Reduction and State Assignment – Shift Registers – Counters – HDL for Sequential Logic Circuits.

UNIT IV ASYNCHRONOUS SEQUENTIAL LOGIC 9

Analysis and Design of Asynchronous Sequential Circuits – Reduction of State and Flow Tables – Race-free State Assignment – Hazards.

UNIT V MEMORY AND PROGRAMMABLE LOGIC 9

RAM and ROM – Memory Decoding – Error Detection and Correction – Programmable Logic Array – Programmable Array Logic – Sequential Programmable Devices – Application Specific Integrated Circuits.

TOTAL HOURS: 45

TEXT BOOKS

1. Morris Mano M. and Michael D. Ciletti, “Digital Design”, IV Edition, Pearson Education, 2008.

REFERENCES

1. John F. Wakerly, “Digital Design Principles and Practices”, Fourth Edition, Pearson Education, 2007.

2. Charles H. Roth Jr, “Fundamentals of Logic Design”, Fifth Edition – Jaico Publishing House, Mumbai, 2003.

3. Donald D. Givone, “Digital Principles and Design”, Tata Mcgraw Hill, 2003.

4. Kharate G. K., “Digital Electronics”, Oxford University Press, 2010.

SEMESTER-III

DATA STRUCTURES

L	T	P	C
3	0	0	3

AIM

The aim is to introduce the concept of storage of data using list, stack, queue

OBJECTIVES

- To introduce the concepts of Advanced Data Structures.
- To introduce the concepts of Tree

OUTCOMES:

- Understand different data structures and its applications.
- Develop ability to analyze algorithms, to determine algorithm correctness and time efficiency.
- Design data structures for complex computing problems.
- Identify, model, solve and develop code for real life problems like shortest path, network flow, and minimum spanning using graphs
- Evaluate the performance of computing solutions in terms of time and space.

Unit I Linear Structures **9**

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

Unit II Tree Structures **9**

Tree ADT – tree traversals – left child right sibling data structures for general trees –Binary Tree ADT – expression trees – applications of trees – binary search tree ADT –Threaded Binary Trees.

Unit III Balanced Trees **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 –biconnectivity – Euler circuits – applications of graphs

TOTAL HOURS: 45

TEXT BOOKS

1. M. A. Weiss, “Data Structures and Algorithm Analysis in C”, Second Edition, Pearson Education, 2005.

REFERENCES

1. A. V. Aho, J. E. Hopcroft, and J. D. Ullman, “Data Structures and Algorithms”, Pearson Education, First Edition Reprint 2003.

2. R. F. Gilberg, B. A. Forouzan, “Data Structures”, Second Edition, Thomson India,Edition, 2005.

SEMESTER-III

OBJECT-ORIENTED PROGRAMMING USING C++

L	T	P	C
3	01	0	4

AIM

To implement and manipulate object oriented programming concepts

OBJECTIVES

- To implement the concepts of object oriented programming.
- To implement oops structures using object oriented programming language.
- To use standard template library in the implementation oops data structures

OUTCOMES:

- Understand the concepts of Object Oriented Programming.
- Select and use objects from standard template libraries
- Examine and design reusable components.
- Assemble an efficient code for engineering problems.

UNIT I **9**

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

UNIT II **9**

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

UNIT III **9**

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

UNIT IV **9**

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

UNIT V **9**

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

TOTAL HOURS: 45

TEXT BOOKS

1. B. Trivedi, “Programming with ANSI C++”, Oxford University Press, 2007.

REFERENCES

1. Ira Pohl, “Object Oriented Programming using C++”, Pearson Education, Second Edition Reprint 2004.

2. S. B. Lippman, Josee Lajoie, Barbara E. Moo, “C++ Primer”, Fourth Edition, Pearson Education, 2005.

3. B. Stroustrup, “The C++ Programming language”, Third edition, Pearson Education, 2004.

SEMESTER-III

DATABASE MANAGEMENT SYSTEMS

L	T	P	C
3	0	0	3

AIM

To provide a strong foundation in database technology and an introduction to the current trends in this field.

OBJECTIVES

- To learn the fundamentals of data models and to conceptualize and depict a database system using ER diagram.
- To make a study of SQL and relational database design.
- To understand the internal storage structures using different file and indexing techniques which will help in physical DB design.
- To know the fundamental concepts of transaction processing- concurrency control techniques and recovery procedure.
- To have an introductory knowledge about the Storage and Query processing techniques

OUTCOMES

- Describe a relational database and object-oriented database.
- Create, maintain and manipulate a relational database using SQL
- Describe ER model and normalization for database design.
- Examine issues in data storage and query processing and can formulate appropriate solutions.
- Design and build database system for a given real world problem.

UNIT I INTRODUCTION **9**

Database System Applications - Views of data - Data Models - Database Languages -Modification of the Database - Database System Architecture - Database users and Administrator- Introduction to relational databases - Structure of Relational Databases - Entity-Relationship model (E-R model) - E-R Diagrams.

UNIT II RELATIONAL MODEL & SQL **9**

The relational Model - Additional & Extended Relational - Types of Keys - Relational Algebra - Null Values - Domain Relational Calculus - Tuple Relational Calculus - Fundamental operations - Additional Operations- SQL fundamentals - Structure of SQL Queries SQL Data Types and Schemas - Nested Sub queries - Complex Queries - Integrity Constraints - Triggers - Security - Advanced SQL Features - Embedded SQL- Dynamic SQL- Views - Introduction to Distributed Databases and Client/Server Databases

UNIT III DATABASE DESIGN **9**

Overview of the Design Process - Functional Dependencies - Non-loss Decomposition - Functional Dependencies - Normalization and its Types - Dependency Preservation - Boyce/Codd Normal Form- Decomposition Using Multi-valued Dependencies and Fourth Normal Form - Join Dependencies and Fifth Normal Form - Entity Sets and its Types.

UNIT IV TRANSACTIONS **9**

Transaction Concepts - Transaction State - Transaction Recovery - ACID Properties - System Recovery - Media Recovery - Two Phase Commit - SQL Facilities for recovery -Advanced Recovery Techniques - Buffer Management - Remote Backup Systems - Concurrency Control - Need for Concurrency - Locking Protocols -Two Phase Locking - Internet Locking - Deadlock Handling - Serializability - Recovery Isolation Levels - SQL Facilities for Concurrency.

UNIT V DATA STORAGE AND QUERY PROCESSING **9**

Introduction to Storage and File Structure - 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 - Bitmap Indices - Static Hashing - Dynamic Hashing -Query Processing - Catalog Information for Cost Estimation – Selection Operation - Sorting - Join Operation - Query optimization - Database Data Analysis.

TOTAL HOURS: 45

TEXT BOOKS

1. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, “Database System Concepts”, Fifth Edition, Tata McGraw Hill, 2006 .

2. Ramez Elmasri, Shamkant B. Navathe, “Fundamentals of Database Systems”, Fourth Edition, Pearson / Addision wesley, 2007.

REFERENCES

1. Raghu Ramakrishnan, “Database Management Systems”, Third Edition, McGraw Hill, 2003.

2. S.K.Singh, “Database Systems Concepts, Design and Applications”, First Edition, Pearson Education, 2006.

SEMESTER-III

DATA STRUCTURES LAB

L	T	P	C
0	0	4	2

AIM

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

OBJECTIVES

- To learn the systematic way of solving problems.
- To understand the different methods of organizing large amounts of data.
- To introduce the practical and formal aspects of data structures
- To teach methodologies useful for the implementation and empirical evaluation of sorting and searching algorithms.
- To efficiently implement the solutions for specific problems using data structures.

OUTCOMES

- Implement stack, queue and list ADT to manage the memory using static and dynamic allocations
- Apply binary search tree to construct expression trees used in indexing.
- Identify and create code for real life applications of shortest path and Minimum Spanning Tree.
- Develop and compare the graph search algorithms and sorting algorithms.

Implement the following exercises using C++:

1. Exercises using Objects, Classes, Inheritance,
2. Operator Overloading and Polymorphism.
3. Array implementation of List Abstract Data Type (ADT)
4. Linked list implementation of List ADT
5. Cursor implementation of List ADT
6. Array implementations of Stack ADT
7. Linked list implementations of Stack ADT
8. Queue ADT
9. Search Tree ADT - Binary Search Tree
10. Heap Sort
11. Quick Sort

SEMESTER-III

OBJECT-ORIENTED PROGRAMMING LAB

L	T	P	C
0	0	4	2

AIM

To familiarize the students with the features of Object Oriented Programming with various data types, control structures, storage classes & various I/O statements of C & C++.

OBJECTIVES

- To introduce students the syntax to create inline and friend functions.
- To explain the various concepts of overloading such as function overloading, operator overloading
- To introduce the levels of inheritance & ambiguity problems in them.
- To familiarize the students with polymorphism & their implementation in C++.

OUTCOMES

- Capable of explaining procedure as well as object oriented programming concepts & their differences.
- Able to implement inline and friend function very well.
- Familiar with how to make programs using function overloading & operator overloading.
- Get the capability to implement the different types of inheritance & done problems related to them.

List of Experiments

1. Implement various types of polymorphism & the use of pointers for virtual fu
2. Design C++ classes with static members, methods with default arguments, friend functions. (For example, design matrix and vector classes with static allocation, and a friend function to do matrix-vector multiplication)
3. Implement complex number class with necessary operator over loadings and type conversions such as integer to complex, double to complex, complex to double etc.
4. Implement Matrix class with dynamic memory allocation and necessary methods. Give proper constructor, destructor, copy constructor, and overloading of assignment operator.
5. Overload the new and delete operators to provide custom dynamic allocation of memory.
6. Develop a template of linked-list class and its methods.
7. Develop templates of standard sorting algorithms such as bubble sort, insertion sort, merge sort, and quick sort.
8. Design stack and queue classes with necessary exception handling.
9. Define Point class and an Arc class. Define a Graph class which represents graph as a collection of Point objects and Arc objects. Write a method to find a minimum cost spanning tree in a graph.

10. Develop with suitable hierarchy, classes for Point, Shape, Rectangle, Square, Circle, Ellipse, Triangle, Polygon, etc. Design a simple test application to demonstrate dynamic polymorphism and RTTI.
11. Write a C++ program that randomly generates complex numbers (use previously designed Complex class) and writes them two per line in a file along with an operator (+, -, *, or /). The numbers are written to file in the format (a + ib). Write another program to read one line at a time from this file, perform the corresponding operation on the two complex numbers read, and write the result to another file (one per line).

SEMESTER-III

DATABASE MANAGEMENT SYSTEM LAB

L	T	P	C
0	0	4	2

AIM:

The aim of this laboratory is to inculcate the abilities of applying the principles of database management systems. The course aims to prepare the students for projects where a proper implementation of databases will be required.

OBJECTIVES:

- The students will be able to create a database file
- The students will be able to query a database file
- The students will be able to append and update a database file

OUTCOMES

- Demonstrate the basic fundamentals of Structured Query Language (SQL).
- Employ the conceptual and relational models to design large database systems.
- Design and build database system for a given real world problem.

1. Data Definition Language (DDL) commands in RDBMS.
2. Data Manipulation Language (DML) and Data Control Language (DCL) commands in RDBMS.
3. High-level language extension with Cursors.
4. High level language extension with Triggers
5. Procedures and Functions.
6. Embedded SQL.
7. 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

SEMESTER-IV

PROBABILITY AND QUEUING THEORY

L	T	P	C
3	1	0	4

Aim:

To provide students with mathematical knowledge and skills needed to support their concurrent and subsequent engineering and science studies

Objective:

- To develop the skills of the students in the area of Probability and Queuing theory.
- To provide the students about the basic concepts in testing of hypothesis.
- To equip the students about the techniques in Queuing theory.

Outcome:

- Students will be able to gain knowledge in Probability and Queuing theory.
- Students will be able to make simple mathematical descriptions or modeling.
- Students are able to solve the problems in Queuing theory.

UNIT-I 12

PROBABILITY AND RANDOM VARIABLES

Probability concepts, Random variables, moments, Moment Generating function and their properties.

UNIT-II 12

STANDARD DISTRIBUTIONS

Binomial, Poisson, Geometric, Negative binomial, Uniform, Exponential, Gamma, Weibull distributions, Functions of random variable, Chebychev inequality

UNIT-III 12

TWO-DIMENSIONAL RANDOM VARIABLES

Marginal and conditional distributions, Covariance, Correlation and regression, Transformation of random variables, Central limit theorem

UNIT-IV 12

RANDOM PROCESSES, MARKOV CHAIN

Classification, Stationary process, Markov process, Binominal process, Poisson process, Birth and death process, Renewal process, Markov chain, Transition probabilities, Limiting distributions.

UNIT-V 12

QUEUEING THEORY

Markovian queueing models, Little's formula, M/M/1, M/M/C – finite and infinite capacity

Lecture Hours: 45

Tutorial Hours: 15

Total hours: 60

TEXT BOOK:

1. . Dr.A.Singaravelu, "Probability and Queuing Theory", Meenakshi Agency,Chennai(2012).

REFERENCES:

1. T.Veerarajan, "Probability, Statistics and Random processes" (Third Edition), Tata McGraw-Hill publishing Company Ltd., New Delhi (2008).

2. P.Kandasamy, K.Thilagavathy, K.Gunavathy " Probability, Random Variables and Random Processes" (2008) : S.Chand &Company Ltd., New Delhi

3. Kapur.J.N. and Saxena.H.C."Mathematical Statistics",S.Chand & Company Ltd.New Delhi(1997).

SEMESTER-IV

COMPUTER ORGANIZATION AND ARCHITECTURE

L	T	P	C
3	0	0	3

Aim:

To study the internal organization and the architecture of computer.

Objective:

- To learn about the design of the processors.
- To learn about the data transfer

OUTCOMES:

- Understand the functional units of a computers, bus structures and addressing modes
- Apply the knowledge of algorithms to solve arithmetic problems.
- Learn about single bus, multiple bus organization and pipelining concepts
- Analyze RAM, ROM, Cache memory and virtual memory concepts
- Evaluate the various I/O interfaces

UNIT I: INTRODUCTION **9**

Computer Organization- Main memory – CPU operation – Interrupt concept – I/ O techniques – Bus concept – Computer performance factors – System performance measurement- High performance techniques – Comparison of Architecture and Organization – Study of Salient features and architectures of Advanced processors (80286, 80386, 80486, Pentium)

UNIT II: PROCESSOR DESIGN AND CONTROL UNIT **9**

Goals – Design process –Data path organization – Main memory interface – Data path for single instructions- Floating point unit data path – Role of control unit – Reset sequence – Interrupt recognition and servicing – Abnormal situation handling – Hardwired control unit – Micro programmed control unit

UNIT III: MEMORY DESIGN & MEMORY MANAGEMENT **9**

Memory types – Functional and usage modes – Memory allocation- Multiple memory decoding – Memory hierarchy – Instruction pre fetch – Memory interleaving – Write buffer – Cache memory – Virtual memory – Associative memory

UNIT IV: INTRA SYSTEM COMMUNICATION AND I/O **9**

I/O controller & driver- Case study : Hard disk controller in IBM PC – I /O ports and bus concepts – Case study : Keyboard interface – Bus cycle – Asynchronous and Synchronous Transfer – Interrupt handling in PC – I/O techniques in PC – Case Study : RS 232 interface – Modern serial I/O interface – Bus arbitration techniques – Hard disk interface in PC

UNIT V: ADVANCED ARCHITECTURE **9**

Classification of parallelism – Multiple functional units – Pipelining – Vector computing – array processors –High performance architecture – RISC systems – Super scalar architecture – VLIW architecture – EPIC architecture – Multiprocessor systems – Cache coherence problem – Fault tolerance

TOTAL HOURS: 45

TEXT BOOKS

1. B.Govindarajulu, " Computer Architecture and Organization – Design principles and applications" , Tata McGrawHill publications, New Delhi
2. Carl Hamacher, Zvonko Vranesic And Safwat Zaky, "Computer Organization", Fifth Edition,Tata Mcgraw Hill, 2002.

REFERENCES

1. William Stallings, "Computer Organization And Architecture – Designing For Performance", Sixth Edition, Pearson Education, 2003.
2. David A. Patterson And John L. Hennessy, "Computer Organization And Design: The Hardware/Software Interface", Second Edition, Morgan Kaufmann, 2002.
3. John P. Hayes, "Computer Architecture And Organization", Third Edition, Tata McGraw Hill, 1998.
4. A.K.Ray & K.M.Bhurchandi, "Advanced Microprocessors and peripherals- Architectures, Programming and Interfacing", TMH, 2002 reprint.

SEMESTER-IV

SYSTEM SOFTWARE

L	T	P	C
3	01	0	4

AIM

To study the internal structures and methodologies used in System Software

OBJECTIVES

- To study the design and implementation issues in implementing assemblers.
- To study the role of linkers and loaders and the interaction with hardware.
- To study how macro processors work, and a brief introduction to compilers.
- To study various issues in the design of Virtual Machines
- To study the techniques used in other system software contexts such as emulators, process virtual machines, profiling, migration and grids.

OUTCOMES

- Fundamental knowledge about working of language processors and architectures of hypothetical machines
- Understand the design of an assembler.
- Design a loader for loading an object program for execution
- Develop skills to design macro processors using C language Impart basic knowledge to develop other system software like text editors and

UNIT I INTRODUCTION 8

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

UNIT II ASSEMBLERS 10

Basic assembler functions - A simple SIC assembler – Assembler algorithm and datastructures - 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 HOURS: 45

TEXT BOOKS

1. Leland L. Beck, "System Software – An Introduction to Systems Programming", 3rd Edition, Pearson Education Asia, 2006.

REFERENCES

1. D. M. Dhamdhere, "Systems Programming and Operating Systems", Second Revised Edition, Tata McGraw-Hill, 2000.

2. John J. Donovan "Systems Programming", Tata McGraw-Hill Edition, 2000.

3. John R. Levine, Linkers & Loaders – Harcourt India Pvt. Ltd., Morgan Kaufmann Publishers, 2000.

SEMESTER-IV

JAVA PROGRAMMING

L	T	P	C
3	01	0	4

AIM

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

OBJECTIVES

- Understand fundamentals of programming such as variables, conditional and iterative execution, methods, etc.
- Be aware of the important topics and principles of software development.
- Understand Event Handling and Swing Components
- Understand Generic Programming

OUTCOMES

The student should be able to

- write basic program in java
- create and use packages and interfaces in java
- use user defined and inbuilt exceptions create multi threaded applications
- use all types of character and byte streams
- create GUI based trivial applications

UNIT I BASICS OF JAVA **9**

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

UNIT II ARRAYS, STRINGS & OBJECTS **10**

Arrays – Strings - Packages – Java-Doc comments –- Inheritance – class hierarchy – polymorphism – dynamic binding – final keyword – abstract classes - The Object class – Reflection – interfaces – object cloning – inner classes – proxies

UNIT III EVENTS & GRAPHICS PROGRAMMING **8**

I/O Streams - Filter and pipe streams – Byte Code interpretation - Basics of event handling – event handlers – adapter classes – actions – mouse events – AWT event hierarchy – Graphics programming – Frame – Components – working with 2D shapes

UNIT IV SWING & GENERIC PROGRAMMING **8**

Introduction to Swing – Model-View-Controller design pattern – buttons – layout management – Swing Components – exception handling – exception hierarchy – throwing and catching exceptions - Motivation

for generic programming – generic classes – generic methods – generic code and virtual machine – inheritance and generics – reflection and generics

UNIT V THREADS & SOCKET PROGRAMMING 10

Multi-threaded programming – interrupting threads – thread states – thread properties – thread synchronization – Executors – synchronizers – Socket Programming – UDP Datagram – Introduction to Java Beans.

TOTAL HOURS: 45

TEXT BOOK:

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

REFERENCES:

1. K. Arnold and J. Gosling, "The JAVA programming language", Third edition, Pearson Education, 2000.

2.Timothy Budd, "Understanding Object-oriented programming with Java", Updated Edition, Pearson Education, 2000.

3. C. Thomas Wu, "An introduction to Object-oriented programming with Java", Fourth Edition, Tata McGraw-Hill Publishing company Ltd., 2006.

4.Elliotte Rusty Harold, " Java Network Programming", O'Reilly publishers, 2000 (UNIT II)

5.Ed Roman, "Mastering Enterprise Java Beans", John Wiley & Sons Inc., 1999. (UNIT III and UNIT V)

SEMESTER-IV

OPERATING SYSTEMS

L	T	P	C
3	0	0	3

AIM

The course introduces the students to the basic principles of operating systems.

OBJECTIVES

- To be aware of the evolution of operating systems
- To learn what processes are, how processes communicate, how process synchronization is done and how to manage processes
- To have an understanding of the main memory and secondary memory management techniques.
- To understand the I/O Subsystem
- To have an exposure to Linux and Windows 2000 operating systems

OUTCOMES

- Understand Operating System Structure, Operations and Services
- Understand the Process Concept, Multithreaded Programming, Process Scheduling and Synchronization
- Apply the Concepts of Virtual Memory Management and File Systems
- Analyze the Secondary Storage and I/O Systems

UNIT I PROCESSES AND THREADS 9

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

UNIT II PROCESS SCHEDULING AND SYNCHRONIZATION 10

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

UNIT III STORAGE MANAGEMENT 9

Memory Management: Background – Swapping – Contiguous memory allocation – Paging – Segmentation – Segmentation with paging. Virtual Memory: Background –Demand paging –

Process creation – Page replacement – Allocation of frames – Thrashing. Case Study: Memory management in Linux

UNIT IV FILE SYSTEMS **9**

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

UNIT V I/O SYSTEMS **8**

I/O Systems – I/O Hardware – Application I/O interface – kernel I/O subsystem – streams – performance. Mass-Storage Structure: Disk scheduling – Disk management – Swap-space management – RAID – disk attachment – stable storage – tertiary storage. Case study: I/O in Linux

TOTAL HOURS: 45

TEXT BOOKS

1. Silberschatz, Galvin, and Gagne, "Operating System Concepts", Sixth Edition, Wiley India Pvt Ltd, 2003.

REFERENCES

1. Andrew S. Tanenbaum, "Modern Operating Systems", Second Edition, Pearson Education, 2004.

2. Gary Nutt, "Operating Systems", Third Edition, Pearson Education, 2004.

3. Harvey M. Deital, "Operating Systems", Third Edition, Pearson Education, 2004.

SEMESTER-IV

COMPUTER NETWORKS

L	T	P	C
3	0	0	3

AIM :

To understand the concepts of data communication and computer networks

OBJECTIVES:

- To grasp the principles of data communication.
- To understand the layering concepts in computer networks.
- To understand the functions of each layer.

OUTCOMES

- Understand the number theory concepts
- Impart knowledge on symmetric and asymmetric encryption techniques.
- Create an understanding of Authentication functions the manner in which Message Authentication Codes and Hash Functions works.
- Examine the issues and structure of Authentication Service and Electronic Mail Security, web security and IP security.
- Provide familiarity in system security.

UNIT I PHYSICAL LAYER **9**

OSI model – Layers in OSI model – Data and Signals, Digital Transmission, Analog Transmission, Bandwidth Utilization: Multiplexing and Spreading, Transmission Media, Switching Using Telephone and Cable Networks for Data Transmission.

UNIT II DATA LINK LAYER **10**

Types of Errors, Redundancy, Detection Versus Correction, Data Link Control, Media Access Control, Forward Error Correction Versus Retransmission, Block Coding, Linear Block Codes, Cyclic codes, Checksum.

UNIT III NETWORK LAYER **9**

Logical addressing: IPv4, IPv6 addresses. Internet Protocol: Internetworking – IPv4, IPv6 - Address mapping – ARP, RARP,BOOTP, DHCP, ICMP, IGMP, Delivery - Forwarding - Routing – Unicast, Multicast routing protocols.

UNIT IV TRANSPORT LAYER **8**

Process-to-Process delivery - User Datagram Protocol (UDP) – Transmission Control Protocol (TCP) – Congestion Control – Quality of services (QoS) – Techniques to improve QoS.

UNIT V APPLICATION LAYER **9**

Domain Name System (DNS) – E-mail – FTP – WWW – HTTP – Multimedia Network Security: Cryptography – Symmetric key and Public Key algorithms - Digital signature –Management of Public keys – Communication Security – Authentication Protocols.

TOTAL HOURS: 45

TEXT BOOKS

1. Behrouz A. Foruzan, “Data communication and Networking”, Fifth Edition, Tata McGraw-Hill, 2013.

2. Andrew S. Tannenbaum, David J. Wetherall “Computer Networks”, Pearson Education, Fifth Edition, 2011.

REFERENCES

1. William Stallings, “Data and Computer Communication”, Eighth Edition, Pearson Education, 2007.

SEMESTER-IV

JAVA PROGRAMMING LAB

L	T	P	C
0	0	4	2

AIM:

To write and execute programs in JAVA programming language.

OBJECTIVES:

The course should enable the students to:
1.Practice logical ability to solve the problems.
2.Understand java programming development environment, compiling, debugging, linking and executing a program using the development environment
3.Understand and apply the in-built functions and customized functions for solving the problems.
4.Study, analyze and understand logical structure of a computer program, and different construct to develop a program in java programming

OUTCOMES:

At the end of the course the student should be able to:

- Apply decision and iteration control structures to implement algorithms in Java
- Able to implement String and string buffer methods
- Implement Complex number operations
- Implement inheritance, polymorphism and object relationship in java
- Implement interfaces as programming techniques
- Able to implement Packages
- Analyze and create Applet Programs
- Apply exceptions handling
- Able to generate multiple threads

List of Experiments

1. Sort a given set of elements using the Quicksort method and determine the time required to sort the elements. Repeat the experiment for different values of n, the number of elements in the list to be sorted and plot a graph of the time taken versus n. The elements can be read from a file or can be generated using the random number generator.
2. Using OpenMP, implement a parallelized Merge Sort algorithm to sort a given set of elements and determine the time required to sort the elements. Repeat the experiment for different values of n, the number of elements in the list to be sorted and plot a graph of the time taken versus n. The elements can be read from a file or can be generated using the random number generator.
3. a. Obtain the Topological ordering of vertices in a given digraph.

   b. Compute the transitive closure of a given directed graph using Warshall's algorithm.
4. Implement 0/1 Knapsack problem using Dynamic Programming.
5. From a given vertex in a weighted connected graph, find shortest paths to other vertices using Dijkstra's algorithm.

6. Find Minimum Cost Spanning Tree of a given undirected graph using Kruskal's algorithm.
7. a. Print all the nodes reachable from a given starting node in a digraph using BFS method.
   b. Check whether a given graph is connected or not using DFS method.
8. Find a subset of a given set S = {s1, s2,.....,sn} of n positive integers whose sum is equal to a given positive integer d. For example, if S= {1, 2, 5, 6, 8} and d = 9 there are two solutions {1,2,6} and {1,8}.A suitable message is to be displayed if the given problem instance doesn't have a solution.
9. Find Minimum Cost Spanning Tree of a given undirected graph using Prim's algorithm.
10. Implement All-Pairs Shortest Paths Problem using Floyd's algorithm. Parallelize this algorithm, implement it using OpenMP and determine the speed-up achieved.

SEMESTER-IV

OPERATING SYSTEMS LAB

L	T	P	C
0	0	4	2

AIM:

To have hands-on experience in operating system concepts and programming in the UNIX environment.

OBJECTIVES:

1. To learn shell programming and the use of filters in the UNIX environment.
2. To learn to program in C using system calls.
3. To learn to use the file system related system calls.
4. To have a knowledge in how processes are created and processes communicate.
5. To learn how process synchronization is done using semaphores.

OUTCOMES

1. The student will be familiar with the language and terms of the UNIX/LINUX operating system
2. The student will be able to delineate the commands and procedures needed to carry out basic operations on the UNIX/LINUX operating system
3. Students can design, develop and implement a software solution to a given problem which employs operating systems tools

List of Experiments

1. Execute Basic UNIX commands
2. Write C programs to simulate UNIX commands like ls, grep, etc.
3. 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. (2sessions)
4. 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. (2sessions)
5. Developing Application using Inter Process communication (using shared memory, pipes or message queues)
6. Implement the Producer – Consumer problem using semaphores
7. Implement some memory management schemes – I
8. Implement some memory management schemes – II
9. Implement any file allocation technique (Linked, Indexed or Contiguous)

SEMESTER-IV

NETWORK PROGRAMMING LAB

L	T	P	C
0	0	4	2

AIM

To have hands-on experience in network programming techniques

OBJECTIVES

- To help students understand the fundamental services provided by TCP and UDP and how information is sent between TCP and UDP ports
- To help students appreciate the basic techniques of design and analyzing networked system.
- Ability to design basic network services with sockets

OUTCOMES

Demonstrate the client-server communication.
Implement data link layer operations.
Develop applications with RMI.
Aware of UNIX commands for Networking.
Implement Application layer functions

List of Experiments

1. Study of Header Files
2. Study of Basic Functions of Socket Programming
3. Simple Tcp/Ip Client Server Communication
4. UDP Echo Client Server Communication
5. Concurrent TCP/IP Day-Time Server
6. Half Duplex Chat Using TCP/IP
7. Full Duplex Chat Using TCP/IP
8. Implementation Of File Transfer Protocol
9. Remote Command Execution Using UDP
10. ARP Implementation Using UDP

SEMESTER-IV

PROFESSIONAL COMMUNICATION AND PERSONALITY DEVELOPMENT LAB

L	T	P	C
0	0	4	2

AIM

To develop graduates with good Presentation and Writing skills (Professional & Technical)

OBJECTIVES

- To improve Aptitude Skills, train to improve self-learning/researching abilities, Presentation Skills & Technical Writing (Reports, Brochures, Manuscripts/Articles)

OUTCOMES

- Develop critical and reflective thinking abilities
- Exhibit responsible decision - making and personal accountability
- Appreciate creative expression and aesthetics
- Exhibit the ability to work effectively with those different from themselves
- Demonstrate a commitment to social justice
- Demonstrate an understanding of group dynamics and effective teamwork

UNIT I – COMMUNICATION AND SELF DEVELOPMENT

Basic Concepts of Communication; Process of Communication; Types of Formal communication; The Media of Communication; Channels of Communication; Barriers in Communication; How to Overcome Barriers to Communication.

UNIT II - GRAMMAR & SYNTAX

Synonyms; Antonyms; Words used as different parts of speech; Spotting errors; Concord; Principle of proximity between subject and verb.

Sentence Structure; Combination and Transformation of sentences; Verb Patterns in English.

NIT III - READING AND WRITING SKILLS

Purpose and Process of Reading; Reading Tactics; Reading Strategies; Reading Comprehension; Paraphrase; Preparing outlines of paragraph/text.

Elements of Effective Writing; Job Application, Bio-data, Personal Resume and Curriculum Vitae;

Preparing Agenda and Minutes of a Meeting; Back office job for organizing a conference/seminar; Writing

Styles; Scientific and Technical Writing; Summary Writing; Writing paragraphs; Writing Essays.

UNIT IV – LISTENING AND SPEAKING SKILLS

Process of listening; Hard and Soft Skills; Feedback Skills; Essentials of Good Communications; Types of Listening; Barriers to Listening; Note taking and Note making.

Skills of Effective Speaking; Component of an Effective Talk; Tone of Voice; Accent, Body Language;

Timing and Duration of Speech; Audio-Visual Aids in Speech.

UNIT V – TECHNICAL REPORT, RESEARCH CASE STUDY & REPORTING

Main considerations in writing a good report; Types and Structure of Reports; Collecting Data; Technical Proposals; Visual Aids; General Tips for Writing Reports.

Research Case Study and Reporting

Text Book

I The Functional Aspects of Communication Skills, Prajapati Prasad and Rajendra K. Sharma, S. K Kataria & Sons, New Deihl, Rep"nt 2007.

Reference Books

1 Business Communication, Sinha K. K, S. Chand, New Delhi.

2. Business Communication, Asha Kaul, Prentice Hall of India.

3 Business Correspondence and Report Writing' A Practical Approach to Business and

Technical Communication, Sharma, R.C. and Krishna Mohan, Tata McGraw-HilI.

4 A New Approach to English Grammar for High Schools, Madan Sabina, Spectrum Books, New Delhi

SEMESTER-V

DISCRETE MATHEMATICS

L	P	T	C
3	1	0	4

Aim:

To provide students with mathematical knowledge and skills needed to support their concurrent and subsequent engineering and science studies

Objectives:

- Logic is the discipline that deals with the methods of reasoning. One of the aims of logic is to provide rules by which we can determine whether a particular reasoning or argument is valid.
- Discrete mathematics is used to design efficient computer networks, optimally assign frequencies to cellular phones, track pollution, fairly rank competitors in a tournament, accurately represent public opinion in political elections, efficiently schedule large projects, plan optimal routes, and solve many other problems, both applied and abstract.
- Computer implementations are significant in applying ideas from discrete mathematics to real-world problems, such as in operations research.
- Combinatorics has wide application in computer Science, especially in such areas as coding theory, analysis of algorithms and probability theory.

Outcome:

- The students will be able to handle problems logically.
- Students are to write computer programs.
- Students have the knowledge of compiler design

UNIT-I

PROPOSITIONAL CALCULUS **12**

Propositions – Logical connectives – Compound propositions – Conditional and biconditional propositions – Truth tables – Tautologies and contradictions – Contrapositive – Logical equivalences and implications – DeMorgan's Laws - Normal forms – Principal conjunctive and disjunctive normal forms – Rules of inference – Arguments - Validity of arguments.

UNIT-II

PREDICATE CALCULUS **12**

Predicates – Statement function – Variables – Free and bound variables – Quantifiers – Universe of discourse – Logical equivalences and implications for quantified statements – Theory of inference – The rules of universal specification and generalization – Validity of arguments.

UNIT-III

COMBINATORICS **12**

Review of Permutation and combination-Mathematical Induction-Pigeon hole principle-Principle of inclusion and exclusion-Generating function-Recurrence relations.

UNIT-IV

GROUPS 12

Semi groups-Monoids-groups-permutation group –Cosets-Lagranges theorem-Group homomorphism-Kernal- Rings and Fields (definitions and Examples only).

UNIT-V

LATTICES **12**

Partial ordering- Posets-Hasse diagram-Lattices-Properties of Lattices-Sub Lattices- Distributed Lattices -Special Lattices-Boolean Algebra-Homomorphism

Lecture Hours: 45
Tutorial Hours: 15
Total hours : 60

Text Books:

1. T.Veerarajan, "Discrete Mathematics", Tata Mc-Graw Publishing Company, New Delhi.

2. Dr.A.Singaravelu,"Discrete Mathematics" ,Meenakshi Publishers,Chennai

References:

1." Discrete Mathematical Structures with Applications to Computer Science by Tremblay J.P, and Manohar R., McGraw Hill Book Company, 1975, International Edition, 1987.

2. Kenneth H.Rosen," Discrete Mathematics and its Applications",Fifth Edition,Tata McGraw-Hill Pub.Co.Ltd., New Delhi,2003.

SEMESTER-V

ENVIRONMENTAL SCIENCE AND ENGINEERING

L	P	T	C
3	0	0	3

(COMMON TO ALL BRANCHES OF B.E./B.Tech./BBA/BCA- CBCS Regulations 2015)

Aim :

The aim of this course is to create awareness in every engineering graduate about the importance of environment, the effect of technology on the environment and ecological balance and make him/her sensitive to the environment problems in every professional endeavour that he/she participates.

Objective: To create awareness on the various pollutions and their impact.

To provide comprehensive insight in natural resources.

To educate the ways and means to protect natural resources.

To impart fundamental knowledge on human welfare measures.

OUTCOMES

The students should be able to:

- Conserve the resources
- Make the environment useful for the future generations and finally to maintain ecological balance and preserve bio-diversity.

UNIT - I - ENVIRONMENT AND NATURAL RESOURCES 9 hrs

Environment - Definition, scope & importance - Public awareness- Forest resources, mineral resources, water resources, food resources, energy resources (uses, over -exploitation & adverse effects in each case) - Scope & role of environmental engineers in conservation of natural resources - Sustainability development.

UNIT - II - ECOSYSTEMS AND BIO – DIVERSITY 9 hrs

Ecosystem - Definition, structure and function - Energy flow -Ecological succession - food chain, food web, ecological pyramids- Introduction, types, characteristics, structure and function of forest, grassland, desert and Aquatic ecosystems - Bio - Diversity :values and uses, hotspots, threats and conservation.

UNIT - III - ENVIRONMENTAL POLLUTION 9 hrs

Pollution - Definition , man-made impacts and control measures of air, water and land pollution - Water quality standards & characterization - Importance of sanitation -Nuclear hazards – Hazardous waste management : Solid waste, waste water and biomedical waste - Prevention of

pollution and role of individual – Disasters management : Floods, earthquake, cyclone and landslides - Clean technology options.

UNIT - IV - SOCIAL ISSUES AND ENVIRONMENT 9 hrs

Urban problems related to energy - Water conservation – Resettlement and rehabilitation of people - Environmental ethics - Climate change - Global warming - Acid rain - Ozone depletion- Waste land reclamation, Environment Protection Act for air, water, wild life and forests - Pollution Control Board.

UNIT - V - HUMAN POPULATION AND ENVIRONMENT 9 hrs

Population growth - Population explosion - Family welfare programme - Environment & human health - Human rights – Value education - Women and child welfare, Role of information technology in environment and human health.

Total: 45 hours

TEXT BOOKS :

1. Environmental Science and Engineering by Dr.A. Ravikrishnan, Sri Krishna Publications, Chennai.

REFERENCES:

1. Wager K.D. "Environmental Management", W.B. Saunders Co. Philadelphia, USA, 1998.

2. Bharucha Erach "The Biodiversity of India" Mapin Publishing Pvt Ltd, Ahmedabad, India

3. Trivedi R.K. " Handbook of Environmental Laws", Rules, Guidelines, Compliances and Standards Vol I & II, Enviro media.

4. Environmental Science and Engineering by Dr. J. Meenambal ,MJP Publication , Chennai Gilbert M. Masters : Introduction to Environmental Engineering and Science , Pearson Education Pvt. Ltd., II Edition, ISBN 81-297-0277-0, 2004

5. Miller T.G. Jr Environmental Science Wadsworth Publishing Co.

6. Townsend C. Harper J. and Michael Begon, Essentials of Ecology,Blackwell Science.

SEMESTER-V

MOBILE COMPUTING

L	P	T	C
3	0	0	3

AIM

Understand the basic concepts of mobile computing and telecommunication

OBJECTIVES:

- Understand the basic concepts of mobile computing
- Be familiar with the network protocol stack
- Learn the basics of mobile telecommunication system
- Be exposed to Ad-Hoc networks
- Gain knowledge about different mobile platforms and application development

Outcomes

The students should be able to

- Understand the various mobile architectures.
- Understand various messaging environment in mobile environments.
- Acquire knowledge to develop mobile applications under PALM and SYMBIAN OSs.
- Write mobile applications using J2ME.

UNIT I INTRODUCTION **9**

Mobile Computing – Mobile Computing Vs wireless Networking – Mobile Computing Applications – Characteristics of Mobile computing – Structure of Mobile Computing Application. MAC Protocols – Wireless MAC Issues – Fixed Assignment Schemes – Random Assignment Schemes – Reservation Based Schemes.

UNIT II MOBILE INTERNET PROTOCOL AND TRANSPORT LAYER **9**

Overview of Mobile IP – Features of Mobile IP – Key Mechanism in Mobile IP – route Optimization. Overview of TCP/IP – Architecture of TCP/IP- Adaptation of TCP Window – Improvement in TCP Performance.

UNIT III MOBILE TELECOMMUNICATION SYSTEM **9**

Global System for Mobile Communication (GSM) – General Packet Radio Service (GPRS) – Universal Mobile Telecommunication System (UMTS).

UNIT IV MOBILE AD-HOC NETWORKS **9**

Ad-Hoc Basic Concepts – Characteristics – Applications – Design Issues – Routing – Essential of Traditional Routing Protocols –Popular Routing Protocols – Vehicular Ad Hoc networks (VANET) – MANET Vs VANET – Security.

UNIT V MOBILE PLATFORMS AND APPLICATIONS **9**

Mobile Device Operating Systems – Special Constrains & Requirements – Commercial Mobile Operating Systems – Software Development Kit: iOS, Android, BlackBerry, Windows Phone – M Commerce– Structure – Pros & Cons – Mobile Payment System – Security Issues.

TOTAL HOURS: 45

TEXT BOOK:

1.Prasant Kumar Pattnaik, Rajib Mall, "Fundamentals of Mobile Computing", PHI Learning Pvt. Ltd, New Delhi – 2012.

REFERENCES:

1.Jochen H. Schller, "Mobile Communications", Second Edition, Pearson Education, New Delhi, 2007.

2.Dharma Prakash Agarval, Qing and An Zeng, "Introduction to Wireless and Mobile systems", Thomson Asia Pvt Ltd, 2005.

3.William.C.Y.Lee,"Mobile Cellular Telecommunications-Analog and Digital Systems", Second Edition,Tata Mc Graw Hill Edition ,2006.

SEMESTER-V

AUTOMATA THEORY AND COMPILER DESIGN

L	P	T	C
3	0	0	3

AIM

To have a foundation on automata theory and to understand the design and implementation of a simple compiler.

OBJECTIVES

- To understand the concepts of automata theory
- To understand the functions of the various phases of a complier
- To get to know about Lexical and Syntactical Analysis
- To gain information on Intermediate Code Generation
- To understand code generation and Optimization

OUTCOMES

The students should be able to

- Apply the theoretical concepts and techniques in designing finite automata.
- Convert regular expressions to FA and minimize Automata.
- Write context free Grammar and design PDA for the Grammar.
- Design turing machine and identify recursively enumerable languages.
- Differentiate the various phases of a compiler.
- Apply parsing techniques and able to write Context Free Grammars for various languages.
- Design the structure of intermediate code for various types of statements and expressions.
- Design code generator and apply code optimization techniques.
- Apply Lambda Calculus to verify programs.

UNIT I AUTOMATA AND REGULAR EXPRESSIONS 9

Introduction to formal proof – Additional forms of proof –Finite Automata (FA) – Deterministic Finite Automata (DFA) – Non-deterministic Finite Automata (NFA) – Finite Automata with Epsilon transitions. Regular Expression – FA and Regular Expressions – Applications of Regular Expression – Closure properties of regular languages

UNIT II CONTEXT – FREE GRAMMARS AND TURING MACHINE 9

Context-Free Grammar (CFG) – Parse Trees – Ambiguity in grammars and languages- Normal forms for CFG – Pumping Lemma for CFL – Closure Properties of CFL - Definition of the Pushdown automata - Turing Machines

UNIT III LEXICAL AND SYNTAX ANALYSIS 9

Introduction to Compiling- The phases- The role of the lexical Analyzer - Syntax Analysis- The role of the parser -Top- down parsing-Bottom-up Parsing-LR parsers-Constructing SLR(1) parsing table

UNIT IV SEMANTIC ANALYSIS AND INTERMEDIATE CODE GENERATION 9

Type Checking- Type Systems-Specification of a simple type checker - Intermediate languages - Declarations-Assignment statements - Boolean expressions- Case statements

UNIT V CODE GENERATION AND CODE OPTIMIZATION 9

Issues in the design of a code generator- The target machine-Run-time storage Management-Basic blocks and flow graphs -A simple code Generator - The dag representation of basic blocks- Introduction to Code optimization - The principle sources of optimization-Peephole optimization- Optimization of basic blocks

TOTAL HOURS: 45

TEXT BOOK:

1. J.E. Hopcroft, R. Motwani and J.D. Ullman, "Introduction to Automata Theory, Languages and Computations", second Edition, Pearson Education, 2007.(Unit I, II)

2. Alfred V. Aho, Ravi Sethi Jeffrey D. Ullman, "Compilers- Principles, Techniques, and Tools", Pearson Education Asia, 2007. (Unit III, IV, V)

REFERENCES:

1.H.R. Lewis and C.H. Papadimitriou, "Elements of the theory of Computation", Second Edition, Pearson Education, 2003.

2.Thomas A. Sudkamp,"An Introduction to the Theory of Computer Science, Languages and 3.Machines", Third Edition, Pearson Education, 2007.

David Galles, "Modern Compiler Design",Pearson Education Asia, 2007

4.Steven S. Muchnick, "Advanced Compiler Design & Implementation", Morgan Kaufmann Pulishers, 2000.

SEMESTER-V

WEB TECHNOLOGY

L	P	T	C
3	0	0	3

AIM:

To provide the web concepts and enable the student to create simple Web based applications and to create an overview of 3-tier architecture and enable the student to create enterprise applications

OBJECTIVES:

- To create simple Web pages and provide client side validation
- To create dynamic web pages using server side scripting
- To design and create user interfaces using JSP.
- To write the business logic for the middle tier.
- To provide transaction and security support for enterprise applications.

OUTCOMES:

The students should be able to

- Describe the basic concepts of Internet programming and protocols used.
- Create WebPages using HTML, HTML5 ,DHTML,
- Write scripts using CSS and Java Script.
- Develop applications using SERVELETS.

UNIT I INTRODUCTION TO NETWORKS AND WEB CONCEPTS 9

History of the Internet and World Wide Web – Internet standards –URLs - CGI – HTML 4 protocols – HTTP, SMTP, POP3, MIME, and IMAP - Introduction to SGML – HTML – forms – frames - tables

UNIT II DYNAMIC HTML & JAVASCRIPT 9

Dynamic HTML – introduction – cascading style sheets – JavaScript introduction – control structures – functions – arrays – objects – simple web applications, object model and collections – event model – filters and transition – data binding – data control

UNIT III DATABASE & XML 10

Database Connectivity – JDBC Drivers – SQL Statements - XML – Structure in Data – Default Namespaces – DTD – XSD– Parsing XML.

UNIT IV ASP & Session Tracking 8

ASP – Working of ASP – Objects – File System Objects – ADO – Access a Database from ASP – Server side Active-X Components – HTTP GET and POST requests – session tracking – cookies.

UNIT V SERVLETS AND JSP **9**

Introduction – Servlet – Architecture – Lifecycle– Generic Servlet & HTTP Servlet - JSP – Overview – Objects – scripting – Standard Actions – Directives.

TOTAL HOURS: 45

TEXT BOOK

1.Deitel & Deitel, Goldberg, "Internet and World Wide Web – How to Program", Pearson Education Asia, 2001.

2.Uttam K.Roy, "Web Technologies", OXFORD University Press – 2010

REFERENCES

1. Behrouz A. Forouzan ,"TCP/IP Protocol Suite", Tata McGraw-Hill ,4th Edition,2010

2. Eric Ladd, Jim O' Donnel, "Using HTML 4, XML and JAVA", Prentice Hall of India – QUE, 1999.

3. Aferganatel, "Web Programming: Desktop Management", PHI, 2004.

4. Rajkamal, "Web Technology", Tata McGraw-Hill, 2001.

5.R. Krishnamoorthy & S. Prabhu, "Internet and Java Programming", New Age International Publishers, 2004.

6. Thomno A. Powell, "The Complete Reference HTML and XHTML", fourth edition, Tata McGraw Hill, 2003.

7. Naughton, "The Complete Reference – Java2", Tata McGraw-Hill, 3rd edition, 1999.

SEMESTER-V

COMPUTER GRAPHICS

L	T	P	C
3	0	0	3

AIM

Provide an opportunity for students to represent, design and implement two dimensional and three dimensional objects and learn various multimedia related concepts

OBJECTIVES

- Gain knowledge about graphics hardware devices and software used.
- Understand the two dimensional graphics and their transformations.
- Understand the three dimensional graphics and their transformations.
- Appreciate illumination and color models.
- Be familiar with understand clipping techniques.

OUTCOMES

The students should be able to

- Develop algorithms to draw fundamental drawings
- Develop real-time rendering graphics
- Create 2D and 3D images
- Have an understanding on the basics of creating multimedia applications
- Design and Develop multimedia applications

UNIT I INTRODUCTION 9

Survey of computer graphics, Overview of graphics systems – Video display devices, Raster scan systems, Random scan systems, Graphics monitors and Workstations, Input devices, Hard copy Devices, Graphics Software; Output primitives – points and lines, line drawing algorithms, loading the frame buffer, line function; circle and ellipse generating algorithms; Pixel addressing and object geometry, filled area primitives.

UNIT II TWO DIMENSIONAL GRAPHICS 9

Two dimensional geometric transformations – Matrix representations and homogeneous coordinates, composite transformations; Two dimensional viewing – viewing pipeline, viewing coordinate reference frame; widow-to-viewport coordinate transformation, Two dimensional viewing functions; clipping operations – point, line, and polygon clipping algorithms.

UNIT III THREE DIMENSIONAL GRAPHICS 9

Three dimensional concepts; Three dimensional object representations – Polygon surfaces- Polygon tables- Plane equations - Polygon meshes; Curved Lines and surfaces, Quadratic surfaces; Blobby objects; Spline representations – Bezier curves and surfaces -B-Spline curves and surfaces. TRANSFORMATION AND VIEWING: Three dimensional geometric and modeling transformations – Translation, Rotation, Scaling, composite transformations; Three dimensional viewing – viewing pipeline, viewing coordinates, Projections, Clipping; Visible surface detection methods.

UNIT IV ILLUMINATION AND COLOUR MODELS 9

Light sources - basic illumination models – halftone patterns and dithering techniques; Properties of light - Standard primaries and chromaticity diagram; Intuitive colour concepts - RGB colour model - YIQ colour model - CMY colour model - HSV colour model - HLS colour model; Colour selection.

UNIT V ANIMATIONS AND REALISM 9

ANIMATION GRAPHICS: Design of Animation sequences – animation function – raster animation – key frame systems – motion specification –morphing – tweening. COMPUTER GRAPHICS REALISM: Tiling the plane – Recursively defined curves – Koch curves – C curves – Dragons – space filling curves – fractals – Grammar based models – fractals – turtle graphics – ray tracing.

TOTAL HOURS: 45

TEXT BOOKS

1. John F. Hughes, Andries Van Dam, Morgan Mc Guire ,David F. Sklar , James D. Foley, Steven K. Feiner and Kurt Akeley ,"Computer Graphics: Principles and Practice", , 3rd Edition, Addison-Wesley Professional,2013. (UNIT I, II, III, IV).

2. Donald Hearn and Pauline Baker M, "Computer Graphics", Prentice Hall, New Delhi, 2007 (UNIT V).

REFERENCES

1. Donald Hearn and M. Pauline Baker, Warren Carithers,"Computer Graphics With Open GL", 4th Edition, Pearson Education, 2010.

2. Jeffrey McConnell, "Computer Graphics: Theory into Practice", Jones and Bartlett Publishers, 2006.

3. Hill F S Jr., "Computer Graphics", Maxwell Macmillan" , 1990.

4. Peter Shirley, Michael Ashikhmin, Michael Gleicher, Stephen R Marschner, Erik Reinhard, Kelvin Sung, and AK Peters, Fundamental of Computer Graphics, CRC Press, 2010.

5. William M. Newman and Robert F.Sproull, "Principles of Interactive Computer Graphics", Mc Graw Hill 1978.

SEMESTER-V

COMPILER DESIGN LAB

L	T	P	C
0	0	4	2

AIM:

The student will be able to design and implement a compiler using the tools at the end of the semester.

OBJECTIVES:

- To implement a lexical analyzer, syntax analyzer using tools.
- To implement a code generator and the necessity for code optimization.
- To know about compiler simulation tools.

OUTCOMES

The students should be able to

- Design and implementlexical analyser using C.
- Design and implement syntactic analysis phase
- Design and implementIntermediate code generation phase
- Implement lexical analyser and parser using tools like LEX and YACC etc

1. Write a program for Constructing NFA from a regular Expression**.**
2. Write a program for Constructing DFA from a regular Expression.
3. Write a program to find leading and Trailing of the given Grammar.
4. Write a program for constructing Top Down Parsing table.
5. Write a program to implement Shift reduce parsing Algorithm.
6. Write a program to implement Operator precedence Parsing Algorithm.
7. Write a program to find the Closure of the given Grammar.
8. Write a program for constructing LR Parsing table.
9. Write a program to generate DAG for the given expression.
10. Write a program to simulate the storage management.
11. Write a program to generate a code for a given intermediate code.

SEMESTER-V

WEB TECHNOLOGY LAB

L	T	P	C
0	0	4	2

AIM:
To design and develop web application

OBJECTIVES
The course should enable the student to
To Design and develop web application
To design and create user interfaces using Java frames and applets
To create simple Web pages and provide client side validation
To create dynamic web pages using server side scripting
To design and create user interfaces using JSP.

OUTCOMES
The students should be able to
- Write programs for simple internet applications.
- Create applications using HTML, DHTML.
- Write scripts using CSS and Java Script.
- Develop applications using Servelets.
- Write applications using XML and JDB.

1. Creation of HTML pages with frames, links, tables and other tags
2. Usage of internal and external CSS along with HTML pages
3. Client side Programming
   # Java script for displaying date and comparing two dates
   # Form Validation including text field, radio buttons, check boxes, list box and other controls
4. Usage of ASP/JSP objects response, Request, Application, Session, Server, ADO etc
   # Writing online applications such as shopping, railway/air/bus ticket reservation system with set of ASP/JSP pages
   # Using sessions and cookies as part of the web application
5. Writing Servlet Program using HTTP Servlet
6. Any online application with database access
7. Creation of XML document for a specific domain
8. Writing DTD or XML schema for the domain specific XML document
9. Parsing an XML document using DOM and SAX Parsers
10. Sample web application development in the open source environment

SEMESTER-V

COMPUTER GRAPHICS LAB

L	T	P	C
0	0	4	2

AIM

Provide an opportunity for students to represent, design and implement two dimensional and three dimensional objects and learn various multimedia related concepts

OBJECTIVES

- Gain knowledge about graphics hardware devices and software used.
- Understand the two dimensional graphics and their transformations.
- Understand the three dimensional graphics and their transformations.
- Appreciate illumination and color models.
- Be familiar with understand clipping techniques.

OUTCOMES

The students should be able to

- Develop algorithms to draw fundamental drawings
- Develop real-time rendering graphics
- Create 2D and 3D images
- Have an understanding on the basics of creating multimedia applications
- Design and Develop multimedia applications

1. Implementation of Algorithms for drawing 2D Primitives – Line (DDA, Bresenham) – all slopes Circle (Midpoint)

2. 2D Geometric transformations – Translation Rotation Scaling Reflection Shear Window-Viewport

3. Composite 2D Transformations

4. Line Clipping

5. 3D Transformations - Translation, Rotation, Scaling.

6. 3D Projections – Parallel, Perspective.

7. Creating 3D Scenes.

8. Image Editing and Manipulation - Basic Operations on image using any image editing software, Creating gif animated images, Image optimization.

9. 2D Animation – To create Interactive animation using any authoring tool.

SEMESTER-VI

DISASTER MITIGATION AND MANAGEMENT

L	T	P	C
3	0	0	3

AIM

To impart awareness on disasters and preparedness during disasters.

OBJECTIVES

1. To Understand basic concepts in Disaster Management
2. To Understand Definitions and Terminologies used in Disaster Management
3. To Understand the Challenges posed by Disasters
4. To understand Impacts of Disasters

OUTCOMES

- Safe evacuation as a mitigation treatment
- Safe evacuation shelters for events such as cyclones and storm surge
- The mitigation treatments are mostly conservative.

UNIT 1 INTRODUCTION **9**

Concept of disaster; Different approaches; Concept of Risk; Levels of disasters; Disaster phenomena and events *(Global, national and regional)*; Natural and man-made hazards

UNIT 2 RISK ASSESSMENT AND VULNERABILITY ANALYSIS **9**

Response time, frequency and forewarning levels of different hazards; Characteristics and damage potential of natural hazards; hazard assessment ;Dimensions of vulnerability factors; vulnerability assessment; Vulnerability and disaster risk; Vulnerabilities to flood and earthquake hazards

UNIT 3 DISASTER MANAGEMENT MECHANISM **9**

Concepts of risk management and crisis management -Disaster management cycle ;Response and Recovery ; Development, Prevention, Mitigation and Preparedness-Planning for relief

UNIT 4 DISASTER RESPONSE **9**

Mass media and disaster management-Disaster Response Plan; Communication, Participation, and Activation of Emergency Preparedness Plan-Logistics Management-Psychological

Response-Trauma and Stress Management-Rumour and Panic Management-Minimum Standards of Relief-Managing Relief-Funding

UNIT 5 DISASTER MANAGEMENT IN INDIA 9

Strategies for disaster management planning; Steps for formulating a disaster risk reduction plan; Disaster management Act and Policy in India; Organizational structure for disaster management in India; Preparation of state and district disaster management plans

Text books

1. Alexander, D. *Natural Disasters,* ULC press Ltd, London, 1993.
2. Carter, W. N. *Disaster Management: A Disaster Management Handbook,* Asian Development Bank, Bangkok, 1991.
3. Chakrabarty, U. K. *Industrial Disaster Management and Emergency Response,* Asian Books Pvt. Ltd., New Delhi 2007.

References

1. Abarquez I. & Murshed Z. *Community Based Disaster Risk Management: Field Practitioner's Handbook,* ADPC, Bangkok, 2004.
2. Goudie, A. *Geomorphological Techniques,* Unwin Hyman, London 1990.
3. Goswami, S. C. *Remote Sensing Application in North East India,* Purbanchal Prakesh, Guwahati, 1997.
4. *Manual on Natural Disaster Management in India,* NCDM, New Delhi, 2001.
5. *Disaster Management in India,* Ministry of Home Affairs, Government of India, New Delhi, 2011.
6. *National Policy on Disaster Management,* NDMA, New Delhi, 2009.
7. *Disaster Management Act. (2005),* Ministry of Home Affairs, Government of India, New Delhi, 2005.

SEMESTER-VI

BUSINESS INTELLIGENCE AND APPLICATIONS

L	T	P	C
3	0	0	3

AIM

To learn about the building up of a successful BI strategy.

OBJECTIVES

- Introduce students to various business intelligence concepts
- To learn the concepts of data integration
- To introduce enterprise reporting

Outcomes

Upon completion of the subject, students will be able to

- examine the concepts of data warehousing and OLAP;
- apply the concepts of BI and DM techniques for clustering, association, and classification;
- Understand existing data collection and operational systems
- Understand key requirements and vision for information managementDevelop proposal for road-map / timescale for implementation
- understand the operation procedures of BI projects in an organization;
- select appropriate DM tools and methods to manipulate and achieve data;
- apply DM concepts for formulating business strategies and programs to enhance business intelligence.

UNIT-I INTRODUCTION TO BUSINESS INTELLLIGENCE 9

Introduction to OLTP AND OLAP – BI Definition and BI Concepts – Business Applications of BI - BI Framework- Role of Data Warehousing in BI –BI Infrastructure Components- BI Process – Developing Data Warehouse – Management Framework – Business driven approach –BI Technology — BI Roles & Responsibilities.

UNIT - II BASICS OF DATA INTEGRATION 9

Concepts of Data Integration need and advantages of using Data Integration – Introduction to common data integration approaches – Introduction to ETL using SSIS – Introduction to Data Quality – Data Profiling Concepts and Applications.

UNIT - III INTRODUCTION TO MULTIDIMENSIONAL DATA MODELING 9

Introduction to Data and Dimensional Modeling – Multi Dimensional Data Model – ER modeling Vs Multi Dimensional Model – Concepts of Dimensions - facts - cubes- attributes- hierarchies- star and snowflake schema – Introduction to Business Metrics and KPIs – Creating Cubes using SSAS.

UNIT - IV BASICS OF ENTERPRISE REPORTING 9

Introduction to Enterprise Reporting - Concepts of dashboards - balanced scorecards – Introduction to SSRS Architecture– Enterprise Reporting using SSRS reporting service

UNIT - V BI ROAD AHEAD 9

BI and Mobility – BI and cloud computing – BI for ERP systems - Benefits of BI in ERP-NorthWind_Traders Data-Data Analyses through Excel-Kettle Tool – Conversion of data using Kettle Tool.

TOTAL HOURS: 45

TEXT BOOKS

1.RN Prasad, Seema Acharya, ”Fundamentals Of Business Analytics” Wiley India,2011

REFERENCES

1.Soumendra Mohanty, “Data Warehousing Design, Development and Best Practices”, Tata McGraw-Hill, New Delhi, 2007.

2.David Loshin, “Business Intelligence”, Morgan Kaufmann Publishsers, San Francisco, Fifth edition, 2007.

3.Larissa Terpeluk Moss and Shaku Atre, “Business Intelligence Roadmap”, Pearson Education, 2007.

SEMESTER-VI

ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS

L	P	T	C
3	0	0	4

AIM

The aim of this course is to provide an introduction to some basic issues and algorithms in artificial intelligence (AI). The course also provides an overview of intelligent agent design, where agents perceive their environment and act rationally to fulfill their goals. The course approaches AI from an algorithmic, computer science-centric perspective.

OBJECTIVES

- To be familiar with the history of AI, philosophical debates, and be able to discuss the potential and limitations of the subject in its current form.
- To identify the kind of problems that can be solved using AI technique: to know the relation between AI and other areas of computer science.
- To have knowledge of generic problem-solving methods in AI.

OUTCOMES

The students should be able to

- Develop a basic understanding ofthe building blocks of AI
- Understand the main approaches to artificial intelligence such
- as heuristic search, game and search.
- Understand machine learning, neural networks and natural language processing.
- Recognize problems that may be solved using artificial intelligence and implement artificial intelligence algorithms for hands-on experience.
- Develop expert systems for an application.

UNIT I-INTRODUCTION **9**

Introduction-Definition-History of Artificial Intelligence-Intelligent Agents-Types Of Agents-Problem Solving Approach To AI Problems-Problem Formulation

UNIT II-PROBLEM SOLVING **9**

Problem Solving Methods-Search Strategies-Uninformed Search Strategies-Comparison of Uninformed Search Algorithms-Informed Search Strategies-Local Search Algorithms-Searching With Partial Information-Constraint Satisfaction Problem

UNIT III-KNOWLEDGE REPRESENTATION **9**

Propositional Logic-First Order Predicate Logic-Prolog Programming-Unification-Forward Chaining- Backward Chaining-Ontological Engineering-Categories and Objects-Events-Mental Events and Mental Objects

UNIT IV-MACHINE LEARNING **9**

Conditional Probability-Joint probability, Prior Probability- Bayes Rule and Its Applications-Bayesian Networks-Inferences in Bayesian Networks- Morkov chain, Hidden Markov Models-Learning from Observation-Supervised Learning

UNIT V-APPLICATIONS **9**

AI Applications-Language Models-Information Retrieval-Information Extraction-Natural Language Processing-Machine Translation-Speech Recognition

TEXT BOOKS

1. S. Russell and P. Norvig, "Artificial Intelligence – A Modern Approach", Second Edition, Pearson Education, 2003.

2. Bratko, I., Prolog Programming For Artificial Intelligence (International Computer Science Series), Addison-Wesley Educational Publishers Inc; 4th Edition, 2011.

REFERENCES

1. David Poole, Alan Mackworth, Randy Goebel,"Computational Intelligence: A Logical Approach", Oxford University Press, 2004.

2. G. Luger, "Artificial Intelligence: Structures and Strategies For Complex Problem Solving", Fourth Edition, Pearson Education, 2002.

3. J. Nilsson, "Artificial Intelligence: A New Synthesis", Elsevier Publishers, 1998.

SEMESTER-VI
OBJECT ORIENTED ANALYSIS AND DESIGN

L	P	T	C
3	0	0	3

AIM:

To study object oriented analysis and design and the techniques needed to apply them.

OBJECTIVES:

- To study the concepts of modeling in object oriented context.
- To learn about the Object Constraint Language.
- To study and learn how to apply analysis techniques and methodologies including Use cases, System Sequence Diagrams.
- To study and learn how to apply design techniques and methodologies including Interaction Diagrams, Class Diagrams.
- To study implementation related issues.
- To study and learn how to apply advanced techniques including Architectural Analysis and Design Patterns.

OUTCOMES:

The student should be able to

- Acquire knowledge of OOAD.
- Demonstrate the design concepts using UML diagrams.
- Practice through object oriented life cycle.
- Draw UML diagrams
- Able to design application using OOAD tools.

UNIT I INTRODUCTION **8**

An Overview of Object Oriented Systems Development - Object Basics – Object Oriented Systems Development Life Cycle.

UNIT II OBJECT ORIENTED METHODOLOGIES **12**

Rumbaugh Methodology - Booch Methodology - Jacobson Methodology - Patterns – Frameworks – Unified Approach – Unified Modeling Language – Use case - class diagram - Interactive Diagram - Package Diagram - Collaboration Diagram - State Diagram - Activity Diagram.

UNIT III OBJECT ORIENTED ANALYSIS **9**

Identifying use cases - Object Analysis - Classification – Identifying Object relationships - Attributes and Methods.

UNIT IV OBJECT ORIENTED DESIGN **8**

Design axioms - Designing Classes – Access Layer - Object Storage - Object Interoperability.

UNIT V SOFTWARE QUALITY AND USABILITY **8**

Designing Interface Objects – Software Quality Assurance – System Usability - Measuring User Satisfaction

TOTAL HOURS: 45

TEXT BOOKS

1. Ali Bahrami, "Object Oriented Systems Development", Tata McGraw-Hill, 1999

2. Martin Fowler, "UML Distilled", Second Edition, PHI/Pearson Education, 2002. (UNIT II)

REFERENCES

1. Stephen R. Schach, "Introduction to Object Oriented Analysis and Design", Tata McGraw-Hill, 2003.

2. James Rumbaugh, Ivar Jacobson, Grady Booch "The Unified Modeling Language Reference Manual", Addison Wesley, 1999.

3.Hans-Erik Eriksson, Magnus Penker, Brain Lyons, David Fado, "UML Toolkit", OMG Press Wiley Publishing Inc., 2004.

SEMESTER-VI

WEB BASED PROGRAMMING USING PHP

L	P	T	C
3	0	0	4

AIM

The proposed elective course exposes the students to understand the features of different technologies involved in Web Development

OBJECTIVES

- Students should be able to design and implement a basic website.
- Students should be able to implement different navigation strategies.
- Students should be able to develop simple back-end database to support a website.
- Students should be able to recognize and evaluate website organizational structure and design elements.

OUTCOMES:

The student should be able to

- apply a structured approach to identifying needs, interests, and functionality of a website.
- design dynamic websites that meet specified needs and interests.
- write well-structured, easily maintained, standards-compliant, accessible HTML code.
- write well-structured, easily maintained, standards-compliant CSS code to present HTML pages in different ways.
- use JavaScript to add dynamic content to pages.
- critique JavaScript code written by others, identifying examples of both good and bad practice.

UNIT – I **9**

Introduction to web applications : HTML - Client Side Scripting Vs Server Side Scripting - WebServers : Local Servers and Remote Servers - Installing Web servers - Internet Information Server(IIS) and Personal Web Server (PWS). Static website vs Dynamic website development.

UNIT – II **9**

Installation of PHP and MySQL - PHP configuration in IIS & Apache Web Server and features of PHP - **Writing PHP :** How PHP code is parsed Embedding PHP and HTML -Executing PHP and viewing in Browser - Data types – Operators - PHP variables: static and global variables Comments in PHP

UNIT – III **9**

Control Structures : Condition statements - If…Else – Switch - ? operator – Loops : While - Break Statement – Continue- Do…While –For -For each - Exit, Die, Return- Arrays in PHP - Working With Data **:** FORM element, INPUT elements - Validating the user input - Passing variables between pages - Passing variables through GET - Passing variables through POST - Passing variables through REQUEST

UNIT – IV **9**

Built-in functions : Sring Functions: chr, ord, strtolower, strtoupper, strlen, ltrim, rtrim, substr, strcmp, strcasecmp, strpos, strrpos, strstr, stristr, str_replace, strrev, echo, print. Math Functions: abs, ceil, floor, round, fmod, min, max, pow, sqrt, rand . Array Functions: count, list, in_array, current, next, previous, end, each, sort, rsort,assort, array_merge, array_reverse ,User Defined Functions.

UNIT – V **9**

Database Connectivity: Introduction to MYSQL, Creating database and other operations on database, connecting to a database, Use a particular database, Sending query to database, Parsing of the query results, Checking data errors. **Case study:** develop a simple real time application with database connectivity.

Total Hours: 45

TEXT BOOKS

1. Core PHP Programming. Leon Atkinson (Prentice Hall, ISBN 0130463469).
2. Programming PHP. RasmusLerdorf, Kevin Tatroe. (O'Reilly, ISBN 1565926102).

REFERNCE BOOKS

1. PHP, MySQL, and JavaScript: A Step-By-Step Guide to Creating Dynamic Websites by Robin Nixon O'Reilly Media; 1 edition
2. Beginning PHP5 and MySQL: From Novice to Professional, W. Jason Gilmore, 2004,
3. The PHP Complete Reference – Steven Holzner – Tata McGraw-Hill Edition

SEMESTER-VI

ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS LAB

L	P	T	C
0	0	4	2

AIM:

The aim of this course is to provide an introduction to some basic issues and algorithms in artificial intelligence (AI). The course also provides an overview of intelligent agent design, where agents perceive their environment and act rationally to fulfill their goals. The course approaches AI from an algorithmic, computer science-centric perspective.

OBJECTIVES:

- To be familiar with the history of AI, philosophical debates, and be able to discuss the potential and limitations of the subject in its current form.
- To identify the kind of problems that can be solved using AI technique: to know the relation between AI and other areas of computer science.
- To have knowledge of generic problem-solving methods in AI.

OUTCOMES

The students should be able to

- Develop a basic understanding ofthe building blocks of AI
- Understand the main approaches to artificial intelligence such
- as heuristic search, game and search.
- Understand machine learning, neural networks and natural language processing.
- Recognize problems that may be solved using artificial intelligence and implement artificial intelligence algorithms for hands-on experience.
- Develop expert systems for an application.

1. Write a program to implementation of DFS
2. Write a program to implement BFS
3. Write a program to implement Traveling Salesman Problem
4. Write a program to implement Simulated Annealing Algorithm
5. Write a program to implement 8 puz zle problems
6. Write a program to implement Tower of Hanoi problem
7. Write a program to implement A* Algorithm
8. Write a program to implement Hill Climbing Algorithm
9. To Study JESS expert system
10. To Study RVD expert system

SEMESTER-VI

CASE TOOLS LAB

L	T	P	C
0	0	4	2

AIM:

Scope of this lab is to understand the application of case tools, which focuses on the software engineering activities.

OBJECTIVES:

• Software requirements analysis and specification
• Software design
• Software implementation
• Software testing and maintenance
• Communication skills and teamwork
• Modeling techniques and CASE tools
• Software project planning and management

OUTCOMES:

The Student should be able to

- Design and implement projects using OO concepts:
- Use the UML analysis and design diagrams
- Apply appropriate design patterns.
- Create code from design
- Compare and contrast various testing techniques

1. Prepare the following documents for two or three of the experiments listed below and develop the software engineering methodology.
2. Program Analysis and Project Planning. Thorough study of the problem – Identify project scope, Objectives, Infrastructure.
3. Software requirement Analysis Describe the individual Phases / Modules of the project, Identify deliverables.
4. Data Modeling Use work products – Data dictionary, Use diagrams and activity diagrams, build and test lass diagrams, Sequence diagrams and add interface to class diagrams.
5. Software Development and Debugging
6. Software Testing
7. Prepare test plan, perform validation testing, Coverage analysis, memory leaks, develop test case hierarchy, Site check and Site monitor.

8. Create an Application for any 2 of the following :
    - Quiz System
    - Student Marks Analyzing System
    - Online Ticket Reservation System
    - Payroll System
    - Course Registration System
    - Expert Systems
    - ATM Systems
    - Stock Maintenance
    - Real-Time Scheduler
    - Remote Procedure Call Implementation

SEMESTER-VI

PHP PROGRAMMING LAB

L	T	P	C
0	0	4	2

AIM

The proposed elective course exposes the students to understand the features of different technologies involved in Web Development

OBJECTIVES

- Students should be able to design and implement a basic website.
- Students should be able to implement different navigation strategies.
- Students should be able to develop simple back-end database to support a website.
- Students should be able to recognize and evaluate website organizational structure and design elements.

OUTCOMES:

The student should be able to

- apply a structured approach to identifying needs, interests, and functionality of a website.
- design dynamic websites that meet specified needs and interests.
- write well-structured, easily maintained, standards-compliant, accessible HTML code.
- write well-structured, easily maintained, standards-compliant CSS code to present HTML pages in different ways.
- use JavaScript to add dynamic content to pages.
- critique JavaScript code written by others, identifying examples of both good and bad practice.

1. Develop a php program using decision making & looping
2. Develop a php program using functions.
3. Develop a php program using arrays & strings
4. Develop a php program for form handling & form validation
5. Develop a php program for file handling & file uploading
6. Develop a php program for implementing cookies & sessions
7. Develop a php program for filters
8. Develop a php program forerror handling
9. Develop a php program for MySQL database connectivity & SQL operations
10. Develop a php program forphp XML parsers.

SEMESTER-VII

CYBER SECURITY

L	T	P	C
3	0	0	4

AIM

To study the critical need for ensuring Cyber Security in real time problems

OBJECTIVES

- To understand the basics of Cyber Security
- To know the legal, ethical and professional issues in Cyber Security
- To know the various attacker techniques

OUTCOME

1. An ability to analyze a problem, and to identify and define the computing requirements appropriate to its solution.
2. An ability to design, implement and evaluate a computer-based solution to meet a given set of computing requirements in the context of the discipline.
3. An ability to communicate effectively with a range of audiences about technical information.
4. An ability to make informed judgements in computing practice based on legal and ethical principles.
5. An ability to function effectively on teams to establish goals, plan tasks, meet deadlines, manage risk and produce deliverables.

UNIT I CYBER SECURITY FUNDAMENTALS **9**

Network and security concepts – basic cryptography – Symmetric encryption – Public key Encryption – DNS – Firewalls – Virtualization – Radio Frequency Identification – Microsoft Windows security Principles.

UNIT II ATTACKER TECHNIQUES AND MOTIVATIONS **9**

Antiforensics – Tunneling techniques – Fraud Techniques - Threat Infrastructure.

UNIT III EXPLOITATION **9**

Techniques to gain a foot hold – Misdirection, Reconnaissance, and disruption methods.

UNIT IV MALICIOUS CODE **9**

Self Replication Malicious code – Evading Detection and Elevating privileges – Stealing Information and Exploitation.

UNIT V DEFENSE AND ANALYSIS TECHNIQUES **9**

Memory Forensics – Honeypots – Malicious code naming – Automated malicious code analysis systems – Intrusion detection systems – Defense special file investigation tools.

TOTAL HOURS: 45

TEXT BOOK

1. James Graham, Richard Howard and Ryan Olson, "Cyber Security Essentials", CRC Press, Taylor & Francis Group, 2011.

REFERENCES

1. By Dan Shoemaker, Ph.D., William Arthur Conklin, Wm Arthur Conklin, "Cyber security: The Essential Body of Knowledge", Cengage Learning, 2012.

2. Ali Jahangiri, "Live Hacking: The Ultimate Guide to hacking Techniques & Counter measures for Ethical Hackers & IT Security Experts", 2009.

SEMESTER-VII

CLOUD COMPUTING

L	T	P	C
3	0	0	3

Aim

The purpose of cloud computing is used to end users access cloud-based applications through a web browser or a light-weight desktop or mobile app while the business software and user's data are stored on servers at a remote location.

OBJECTIVES

- The main objective of a cloud computing entrusts remote services with a user's data, software and computation.

OUTCOMES

- Understand the layers and types of Cloud Computing
- Understand the IaaS, PaaS and SaaS
- Analyze various scheduling techniques for virtual machines in cloud infrastructure
- Implement private/public/hybrid Cloud infrastructure
- Implement policy management system for Cloud Computing
- Design of data security techniques in the Cloud Computing

UNIT I UNDERSTANDING CLOUD COMPUTING 9

Cloud Computing – History of Cloud Computing – Cloud Architecture – Cloud Storage –Why Cloud Computing Matters – Advantages of Cloud Computing – Disadvantages of Cloud Computing – Companies in the Cloud Today – Cloud Services

UNIT II DEVELOPING CLOUD SERVICES 9

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

UNIT III CLOUD COMPUTING FOR EVERYONE 9

Centralizing Email Communications – Collaborating on Schedules – Collaborating on To-Do Lists – Collaborating Contact Lists – Cloud Computing for the Community – Collaborating on Group Projects and Events – Cloud Computing for the Corporation

UNIT IV USING CLOUD SERVICES 9

Collaborating on Calendars, Schedules and Task Management – Exploring Online Scheduling Applications – Exploring Online Planning and Task Management – Collaborating on Event Management

– Collaborating on Contact Management – Collaborating on Project Management – Collaborating on Word Processing - Collaborating on Databases – Storing and Sharing Files

UNIT V OTHER WAYS TO COLLABORATE ONLINE 9

Collaborating via Web-Based Communication Tools – Evaluating Web Mail Services –Evaluating Web Conference Tools – Collaborating via Social Networks and Groupware –Collaborating via Blogs and Wikis

TOTAL HOURS: 45

TEXT BOOKS

1. Michael Miller, "Cloud Computing: Web-Based Applications That Change the Way
You Work and Collaborate Online", Que Publishing, August 2008.

2. Haley Beard, "Cloud Computing Best Practices for Managing and Measuring.Processes for On-demand Computing, Applications and Data Centers in the Cloud with SLAs", Emereo Pty Limited, July 2008.

REFERENCES

1.Rajkumar Buyya, James Broberg, Andzej M.Goscinski, "Cloud Computing –Principles and Paradigms",John Wiley & Sons, 2010.

SEMESTER-VII

C# AND .NET

L	T	P	C
3	0	0	3

AIM

To provide an introduction to the .NET framework and enable the student to program in C#.

OBJECTIVES

- To study basic and advanced features of the C# language
- To create form based and web based applications
- To study the internals of the .NET framework
- To learn about ADO.Net
- To learn about different web services

OUTCOMES

At the end of the course the student should be able to

- Learn the basis of .Net framework.
- Understand object oriented Aspects of C# and ASP.Net.
- Develop simple applications under .Net framework.
- Develop Web based Applications using .Net programming languages

UNIT I INTRODUCTION **9**

Overview Of .Net-Advantages Of .Net Over Other Languages-Assemblies-.Net Architecture-The Role of C# In The .Net Enterprise Architecture-The Common Language Runtime-C# Basics-Objects And Types-Inheritance –Arrays

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

Operators and Casts: Operators - Type Safety - Operator Overloading - User-Defined Casts. Delegates and Events: Delegates – Events. Strings and Regular Expressions: System.String -Regular Expressions. Collections: Collection Interfaces and Types – Lists - Queues – Stacks -Linked Lists - Sorted Lists – Dictionaries – Hash Set - Bit Arrays – Performance-Indexers

UNIT III I/O AND NETWORK PROGRAMMING **9**

Tracing and events - threading and synchronization - .Net security – localization –Manipulating XML - Managing the file system – basic network programming

UNIT IV ADO.NET **9**

Data Access: ADO.NET Overview - Using Database Connections – Commands - Fast Data Access: The Data Reader - Managing Data and Relationships: The DataSet Class – XML Schemas: Generating Code with XSD – Working with ADO.NET. Windows Forms: Creating a Windows Form Application - Control Class - Standard Controls and Components – Forms. Data Binding: The Data Grid View Control - Data Grid View Class Hierarchy - Data Binding - Visual Studio .NET and Data Access.

UNIT V ASP.NET AND WEB SERVICES **9**

ASP.NET Pages: ASP.NET Introduction - ASP.NET Web Forms - ADO.NET and Data Binding. ASP.NET Development: User and Custom Controls - Master Pages - Site Navigation – Security –Themes - Web Parts. ASP.NET AJAX: What Is Ajax - What Is ASP.NET AJAX - Using ASP.NET AJAX.

TOTAL HOURS: 45

TEXT BOOKs

1. Christian Nagel, Bill Evjen, Jay Glynn, Morgan Skinner, Karli Watson, *Professional C#* 2008, Wiley Publishing, Inc., 2008. ISBN: 978-8-126-51627-8.

REFERNCES:

1. Andrew Troelsen, "C# and the .NET Platform", A! Press, 2005.

2.Herbert Schildt, "The Complete Reference: C#", Tata McGraw-Hill, 2004.

3. Kevin Hoffman, "Visual C# 2005", Pearson Education, 2006.

SEMESTER-VII

SOTWARE TESTING

L	T	P	C
3	0	0	3

AIM

The course looks at the role of developers in areas such as test planning, implementation, and defect tracking. It explains how to review and manage test requirements and how to incorporate testing into the software development life cycle.

OBJECTIVES

- To determine software testing objectives and criteria
- To develop and validate a test plan
- To select and prepare test cases
- Test after maintenance and enhancement changes
- To measure the success of testing efforts

OUTCOMES

- Formulate problem by following
- Software Testing Life Cycle.
- Design Manual Test cases for Software Project.
- Identify the realistic problem for different category of software.
- Use automation testing tool students will be able test the software.
- Follow the process related activity and testing techniques to work as team members

UNIT I **9**

Context of Testing in Producing Software - The Incomplete Car - D kstra's Doctrine - A Test in Time! The Cat and the Saint - Test the Tests First! - The Pesticide Paradox - The Convoy and the Rags - The Policemen on the Bridge - The Ends of the Pendulum - Men in Black - Automation Syndrome. Phases of So ware Project - Requirements Gathering and Analysis - Planning - Design - Development or Coding - Testing - Deployment and Maintenance - Quality, Quality Assurance, and Quality Control - Testing, Verification, and Validation - Process Model to Represent Different Phases - Life Cycle Models - Waterfall Model - Spiral or Iterative Model - The V Model = ModiÞed V Model - Comparison of Various Life Cycle Models .

UNIT II **9**

What is White Box Testing? - Static Testing - Static Testing by Humans - Static Analysis Tools - Structural Testing - Unit/Code Functional Testing - Code Coverage Testing - Code Complexity Testing What is Black Box Testing? - Why Black Box Testing? - When to do Black Box Testing? - How to do Black Box Testing? - Requirements Based Testing - Positive and Negative Testing - Boundary Value

Analysis - Decision Tables - Equivalence Partitioning - State Based or Graph Based Testing - Compatibility Testing - User Documentation Testing - Domain Testing.

UNIT III **9**

What is Integration Testing? - Integration Testing as a Type of Testing - Top-Down Integration - Bo om-Up Integration - Bi-Directional Integration - System Integration - Choosing Integration Method - Integration Testing as a Phase of Testing - Scenario Testing - System Scenarios - Use Case Scenarios - Defect Bash. System Testing Overview - Why is System Testing Done? - Functional Versus Non-Functional Testing - Functional System Testing - Design/Architecture VeriÞcation - Business Vertical Testing - Deployment Testing - Beta Testing - CertiÞcation, Standards and Testing for Compliance - Non-Functional Testing - Scalability Testing - Reliability Testing - Stress Testing - Interoperability Testing - Acceptance Testing - Summary of Testing Phases - Multiphase Testing Model - Working Across Multiple Releases - Who Does What and When .

UNIT IV **9**

Introduction - Factors Governing Performance Testing - Methodology for Performance Testing - Collecting Requirements - Writing Test Cases - Automating Performance Test Cases - Executing Performance Test Cases - Analyzing the Performance Test Results - Performance Tuning - Performance Benchmarking - Capacity Planning - Tools for Performance Testing - Process for Performance Testing.What is Regression Testing? - Types of Regression Testing - When to do Regression Testing? - How to do Regression Testing? - Performing an Initial “Smoke” or “Sanity” Test - Understanding the Criteria for Selecting the Test Cases - Best Practices in Regression Testing .

UNIT V **9**

What is Usability Testing? - Approach to Usability - When to do Usability Testing? - How to Achieve Usability? -Quality Factors for Usability - Aesthetics Testing - Accessibility Testing - Basic Accessibility - Product Accessibility - Tools for Usability - Usability Lab Setup - Test Roles for Usability. Perceptions and Misconceptions About Testing - Testing is not Technically Challenging - Testing Does Not Provide me a Career Path or Growth - Am Put in Testing What is Wrong With Me?! - These Folks Are My Adversaries - Testing is What I Can Do in the End if I Get Time - There is no Sense of Ownership in Testing - Testing is only Destructive - Comparison between Testing and Development Functions - Providing Career Paths for Testing Professionals - The Role of the Ecosystem and a Call for Action What are Metrics and Measurements? - Why Metrics in Testing? - Types of Metrics - Project Metrics - Progress Metrics - Release metrics.

TOTAL HOURS: 45

TEXT BOOKS

1. SOFTWARE TESTING – PRINCIPLES AND PRACTICES, Pearson Education, 2016 by Srinivasan Desikan & Ramesh Gopalaswamy.

SEMESTER-VII

C# AND. NET LAB

L	T	P	C
0	0	4	2

AIM:

To provide an introduction to the .NET framework and enable the student to program in C#.

OBJECTIVES:

- To study basic and advanced features of the C# language
- To create form based and web based applications
- To study the internals of the .NET framework\

OUTCOMES

At the end of the course the student should be able to

- Learn the basis of .Net framework.
- Understand object oriented Aspects of C# and ASP.Net.
- Develop simple applications under .Net framework.
- Develop Web based Applications using .Net programming languages

1. Classes and Objects using out, ref and params
2. Student Information System using Properties
3. Banking Application using Inheritance
4. Library Management using Predefined Interfaces
5. Students Admission using User defined Interfaces
6. Solving Postfix Expressions using Stack
7. Solving Complex Numbers using Operator Overloading
8. Matrix Addition, Subtraction, Multiplication and Division using Delegates
9. User Subscription for News Events using Events
10. Calculator using Windows Application
11. Advanced Windows Controls

SEMESTER-VII

SOFTWARE TESTING LAB

L	T	P	C
0	0	4	2

AIM

The course looks at the role of developers in areas such as test planning, implementation, and defect tracking. It explains how to review and manage test requirements and how to incorporate testing into the software development life cycle.

OBJECTIVES

- To determine software testing objectives and criteria
- To develop and validate a test plan
- To select and prepare test cases
- Test after maintenance and enhancement changes
- To measure the success of testing efforts

OUTCOMES

- Formulate problem by following
- Software Testing Life Cycle.
- Design Manual Test cases for Software Project.
- Identify the realistic problem for different category of software.
- Use automation testing tool students will be able test the software.
- Follow the process related activity and testing techniques to work as team members

1. Study of various tools for software testing such as
    a. Selenium
    b. Testlink
    c. JMeter
    d. Defect management tools (any)
    e. Rational Rose
2. Grading System (grades : Distinction, First Class, Second Class, Third Class, Fail, Absent) based on marks
    a. Write a C/C++/Java Program
    b. Write set of test cases to test the program (test Link)
    c. Based on testing assign PASS?FAIL results
    d. Generate test report
3. Triangle program (categorize type of triangle) based on sides and angles give in the input
    a. Write a C/C++/Java Program
    b. Write set of test cases to test the program (test Link)
    c. Generate test report
4. Prime Number generation
    a. Write a C/C++/Java Program
    b. Write set of test cases to test the program (test Link)
    c. Generate test report
5. Automate registration or reservation using one of famous portals (irctc, amazon, flipkart …etc) by using selenium tool

SEMESTER-VII

MINI PROJECT

L	**T**	**P**	**C**
0	**0**	**6**	**3**

1.The objective of Mini Project is to provide opportunity for the student to apply the knowledge acquired during the academic programme to real-life problems which he/she may have to face in future as an engineer

2. Four periods per week shall be allotted in the time table for the activity and this time shall be utilized by the students to receive guidance from the members of faculty on solving real-life problems, practice solving these problems, seminar presentation as assigned by the faculty member in-charge

3. The continuous assessment and semester evaluation may be carried out as specified in the guidelines to be issued from time to time and finally he/she should submit the report.

SEMESTER-VIII

INTERNET OF THINGS

L	T	P	C
3	0	0	3

AIM

To understand the basics of Internet of Things

OBJECTIVES

- To get an idea of some of the application areas where Internet of Things can be applied
- To understand the middleware for Internet of Things
- To understand the concepts of Web of Things
- To understand the concepts of Cloud of Things with emphasis on Mobile cloud computing
- To understand the IOT protocols

OUTCOMES

- Able to understand the application areas of IOT
- AbletorealizetherevolutionofInternetinMobileDevices,Cloud&Sensor Networks
- Able to understand building blocks of Internet of Things and characteristics.

UNIT I INTRODUCTION **9**

Definitions and Functional Requirements –Motivation – Architecture - Web 3.0 View of IoT– Ubiquitous IoT Applications – Four Pillars of IoT – DNA of IoT - The Toolkit Approach for End-user Participation in the Internet of Things. Middleware for IoT: Overview – Communication middleware for IoT –IoT Information Security

UNIT II IOT PROTOCOLS **9**

Protocol Standardization for IoT – Efforts – M2M and WSN Protocols – SCADA and RFID Protocols – Issues with IoT Standardization – Unified Data Standards – Protocols – IEEE 802.15.4 – BACNet Protocol – Modbus – KNX – Zigbee Architecture – Network layer – APS layer – Security

UNIT III WEB OF THINGS **9**

Web of Things versus Internet of Things – Two Pillars of the Web – Architecture Standardization for WoT– Platform Middleware for WoT – Unified Multitier WoT Architecture – WoT Portals and Business Intelligence. Cloud of Things: Grid/SOA and Cloud Computing – Cloud Middleware – Cloud Standards – Cloud Providers and Systems – Mobile Cloud Computing – The Cloud of Things Architecture

UNIT IV INTEGRATED **9**

Integrated Billing Solutions in the Internet of Things Business Models for the Internet of Things - Network Dynamics: Population Models – Information Cascades - Network Effects – Network Dynamics: Structural Models - Cascading Behavior in Networks - The Small-World Phenomenon

UNIT V APPLICATIONS **9**

The Role of the Internet of Things for Increased Autonomy and Agility in Collaborative Production Environments - Resource Management in the Internet of Things: Clustering, Synchronisation and Software Agents. Applications - Smart Grid – Electrical Vehicle Charging

TOTAL HOURS: 45

REFERENCES

1. The Internet of Things in the Cloud: A Middleware Perspective - Honbo Zhou – CRC Press – 2012

2. Architecting the Internet of Things - Dieter Uckelmann; Mark Harrison; Florian Michahelles- (Eds.) – Springer – 2011

3. Networks, Crowds, and Markets: Reasoning About a Highly Connected World - David Easley and Jon Kleinberg, Cambridge University Press - 2010

4. The Internet of Things: Applications to the Smart Grid and Building Automation by – Olivier Hersent, Omar Elloumi and David Boswarthick - Wiley -2012

5. Olivier Hersent, David Boswarthick, Omar Elloumi, "The Internet of Things – Key applications and Protocols", Wiley, 2012.

LIST OF ELECTIVES

ADVANCED DATABASE TECHNOLOGY

L	T	P	C
3	0	0	3

AIM:

Advanced database aims at providing an understanding of the principles used in the design of different kinds of data models. It is also deals with the Transaction management of these different databases.

OBJECTIVES:

- To understand about different data models that can be used for specialized applications
- To make the students to get familiarized with transaction management of advanced database models
- To develop in-depth knowledge about web and intelligent database systems.
- To provide an introductory concept about the way in which data can be stored in multimedia databases.

OUTCOMES:

- Develop Swing-based GUI
- Develop client/server applications and TCP/IP socket programming
- Update and retrieve the data from the databases using SQL
- Develop distributed applications using RMI
- Develop component-based Java software using JavaBeans
- Develop server side programs in the form of servlets
-

UNIT I DISTRIBUTED DATABASES 9

Distributed DBMS Concepts and Design – Introduction – Functions and Architecture of DDBMS – Distributed Relational Database Design – Transparency in DDBMS – Distributed Transaction Management – Concurrency control – Deadlock Management – Database recovery – The X/Open Distributed Transaction Processing Model – Replication servers – Distributed Query Optimisation - Distribution and Replication in Oracle.

UNIT II OBJECT ORIENTED DATABASES 9

Object Oriented Databases – Introduction – Weakness of RDBMS – Object Oriented Concepts Storing Objects in Relational Databases – Next Generation Database Systems – Object Oriented Data models – OODBMS Perspectives – Persistence – Issues in OODBMS – Object Oriented Database Management System Manifesto – Advantages and Disadvantages of OODBMS – Object Oriented Database Design –

OODBMS Standards and Systems – Object Management Group – Object Database Standard ODMG – Object Relational DBMS –Postgres - Comparison of ORDBMS and OODBMS.

UNIT III WEB DATABASES 9

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

UNIT IV INTELLIGENT DATABASES 9

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

UNIT V CURRENT TRENDS 9

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

TOTAL HOURS: 45

TEXT BOOK

1. Thomas M. Connolly, Carolyn E. Begg, "Database Systems - A Practical Approach to Design , Implementation , and Management", Third Edition , Pearson Education, 2003

REFERENCES

1.Ramez Elmasri & Shamkant B.Navathe, "Fundamentals of Database Systems", Fourth Edition , Pearson Education , 2004.

2.M.Tamer Ozsu , Patrick Ualduriel, "Principles of Distributed Database Systems", Second Edition, Pearso nEducation, 2003.

3.C.S.R.Prabhu, "Object Oriented Database Systems", PHI, 2003.

4.Peter Rob and Corlos Coronel, "Database Systems – Design, Implementation and Management", Thompson Learning, Course Technology, 5th Edition, 2003.

ADVANCED JAVA PROGRAMMING

L	T	P	C
3	0	0	3

AIM

To understand the concepts of object-oriented, networking, multi-tier and enterprise application and develop skills in using these paradigms using Advanced Java.

OBJECTIVES

- Understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.
- Be aware of the important topics and principles of software development.
- Have the ability to write programs to solve advanced problems.
- Be able to use the Java SDK, IDEs and Web servers to create, debug and run advanced Java programs.

OUTCOMES:

- Develop Swing-based GUI
- Develop client/server applications and TCP/IP socket programming
- Update and retrieve the data from the databases using SQL
- Develop distributed applications using RMI
- Develop component-based Java software using JavaBeans
- Develop server side programs in the form of servlets

UNIT I JAVA FUNDAMENTALS 9

Java I/O streaming – filter and pipe streams – Byte Code interpretation - reflection – Dynamic Reflexive Classes – Threading – Java Native Interfaces- Swing.

UNIT II NETWORK PROGRAMMING IN JAVA 9

Sockets – secure sockets – custom sockets – UDP datagrams – multicast sockets – URL classes – Reading Data from the server – writing data – configuring the connection – Reading the header – telnet application – Java Messaging services

UNIT III APPLICATIONS IN DISTRIBUTED ENVIRONMENT 9

Remote method Invocation – activation models – RMI custom sockets – Object Serialization – RMI – IIOP implementation – CORBA – IDL technology – Naming Services – CORBA programming Models - JAR file creation

UNIT IV MULTI-TIER APPLICATION DEVELOPMENT 9

Server side programming – servlets – Java Server Pages - Applet to Applet communication – applet to Servlet communication - JDBC – Using BLOB and CLOB objects – storing Multimedia data into databases – Multimedia streaming applications – Java Media Framework.

UNIT V ENTERPRISE APPLICATIONS 9

Server Side Component Architecture – Introduction to J2EE – Session Beans – Entity Beans – Persistent Entity Beans – Transactions.

TOTAL HOURS: 45

TEXT BOOKS

1. Elliotte Rusty Harold, "Java Network Programming", O'Reilly publishers, 2000 (UNIT II)

2. Ed Roman, "Mastering Enterprise Java Beans", John Wiley & Sons Inc., 1999. (UNIT III and UNIT V)

3. Hortsmann & Cornell, "CORE JAVA 2 ADVANCED FEATURES, VOL II", Pearson Education, 2002. (UNIT I and UNIT IV)

REFERENCES

1. Web reference: http://java.sun.com.

2. Patrick Naughton, "COMPLETE REFERENCE: JAVA2", Tata McGraw-Hill, 2003.

BIG DATA AND ANALYTICS

L	T	P	C
3	0	0	3

AIM

To explore tools and practices for working with big data analytics.

OBJECTIVES

To understand how big data analytics can leverage into a key component

OUTCOMES:

It will drive scientific and technological progress, industrial productivity, and defense. However, BDA poses issues of privacy, security, and many more. We hope to contribute to the national discourse on how to promote BDA, but also minimize negative effects.

UNIT 1 DIGITAL DATA AND INTRODUCTION TO BIG DATA 9

Types of Digital Data - Structured Data - Semi-Structured Data - Unstructured Data - Introduction to Big Data - What is Big Data - Why Big Data - Traditional Business Intelligence (BI) versus Big Data - Typical Hadoop Environment - Changes in the Realms of Big Data - Coexistence of Big Data and Data Warehouse

UNIT 2 BIG DATA ANALYTICS 9

What's in Store? - Big Data Analytics - Classification of Analytics - Greatest Challenges that Prevent Businesses from Capitalizing on Big Data - Greatest Challenges that Prevent Businesses from Capitalizing on Big Data - Big Data Analytics Important - Technologies for Meet the Challenges Posed by Big Data - Data Science - Data Scientist - Big Data Environment - Analytics Tools

UNIT 3 HADOOP 9

Introduction to Hadoop - Hadoop Components - Hadoop Conceptual Layer - High Level Architecture of Hadoop -Business Value of Hadoop -Hadoop Distributed File System - Processing Data with Hadoop - MapReduce Daemons - MapReduce working - MapReduce Example - Managing Resources and Application with Hadoop YARN - Hadoop Ecosystem

UNIT 4 MONGODB,CASSANDRA AND HIVE 9

MongoDB - RDBMS and MongoDB - Data Types in MongoDB-CRUD- Introduction to Apache Cassandra - Features of Cassandra - CQL Data Types - CQLSH- Keyspaces-CRUD-Collections- Using a Counter - Time To Live (TTL)-Alter - Import and Export - Export to CSV - Import from CSV - Import from STDIN - Export to STDOUT - System Tables - Practice Examples - Introduction to Hive - Hive Architecture - Hive Data Types - Hive File Format - Hive Query Language - RCFILE Implementation - SERDE - UDF

UNIT 5 PIG AND JASPER REPORTS **9**

Anatomy of Pig - Pig on Hadoop - Pig Philosophy - Use Case for Pig: ETL Processing - Pig Latin Overview - Data Types in Pig - Running Pig - Execution Modes of Pig - HDFS Commands - Relational Operators - Eval Function - Complex Data Type - Piggy Bank - UDF (User Defined Function) - Parameter Substitution - Diagnostic Operator - Word Count Example - When to use Pig? - When NOT to use Pig? - Pig at Yahoo - Pig versus Hive - Hive Vs Pig - Introduction to JasperReports, Jaspersoft Studio - Connecting to MongoDB NoSQL database - Connecting to Cassandra NoSQL Databases

TOTAL HOURS: 45

TEXT BOOKS

1. Big Data and Analytics - Seema Acharya and Subhashini C - Wiley India
2. Big data for dummies - Judith Hurwitz, Alan Nugent,Fern Halper, Marcia Kaufman
3. Hadoop: The Definitive Guide by Tom White
4. Hadoop in action - Chuck Lam
5. Hadoop for dummies - Dirk Deroos, Paul C. Zikopoulos, Roman B. Melnyk,Bruce Brown

REFERENCES

1. Frank J Ohlhorst, “Big Data Analytics: Turning Big Data into Big Money”, Wiley and SAS Business Series, 2012.
2. Colleen Mccue, “Data Mining and Predictive Analysis: Intelligence Gathering and Crime Analysis”, Elsevier, 2007
3. Michael Berthold, David J. Hand, Intelligent Data Analysis, Springer, 2007.
4. Anand Rajaraman and Jeffrey David Ullman, Mining of Massive Datasets, Cambridge University Press, 2012.
5. Bill Franks, “Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics”, Wiley and SAS Business Series, 2012.

BUILDING ENTERPRISE APPLICATION

L	T	P	C
3	0	0	3

AIM

To equip the students with enterprise application designs

OBJECTIVE

To teach the students about various ways to build enterprise applications

COURSE OUTCOMES

- Understand the role of Software Architecture in designing Complex System Architecture.
- Analyze the Various architecture Patterns and Framework
- Understand the various architecture related to middleware technology and Web based environment.
- Implement the architecture design as per the business environment

Unit I **9**

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 application

Unit II **9**

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

Unit III **9**

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

Unit IV **9**

Construction readiness of enterprise applications - defining a construction plan, defining a package structure, setting up a configuration management plan, setting up a development environment, introduction to the concept of Software Construction Maps, construction of technical solutions layers,

methodologies of code review, static code analysis, build and testing, dynamic code analysis – code profiling and code coverage

Unit V **9**

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

TOTAL HOURS: 45

TEXT BOOKS

1.Raising Enterprise Applications – Published by John Wiley, authored by Anubhav Pradhan, Satheesha B. Nanjappa, Senthil K. Nallasamy, Veerakumar Esakimuthu

2. Building Java Enterprise Applications – Published by O'Reilly Media, authored by Brett McLaughlin

REFERENCE BOOK

1. Software Requirements: Styles & Techniques – published by Addison-Wesley Professional

2. Software Systems Requirements Engineering: In Practice – published by McGraw-Hill/Osborne Media

3. Managing Software Requirements: A Use Case Approach, 2/e – published by Pearson

4. Software Architecture: A Case Based Approach – published by Pearson

5. Designing Enterprise Applications with the J2EE Platform (PDF available at-

6. SOFTWARE TESTING Principles and Practices – published by Oxford University Press

CRYPTOGRAPHY AND NETWORK SECURITY

L	T	P	C
3	0	0	3

AIM

To introduce the fundamentals of Cryptography and its application to Security.

OBJECTIVES

- To understand the mathematics behind Cryptography
- To understand the standard algorithms used to provide confidentiality provide integrity and authenticity.
- To get a working knowledge of network security, data base security and DS security issues in order to build secure systems.

OUTCOMES:

1. Identify computer and network security threats, classify the threats and develop a security model to prevent, detect and recover from the attacks. (ABET Outcomes: a, c, e, j, k)
2. Encrypt and decrypt messages using block ciphers, sign and verify messages using well known signature generation and verification algorithms. (ABET Outcomes: c, e, k)
3. Analyze existing authentication and key agreement protocols, identify the weaknesses of these protocols. (ABET Outcomes: c, e, k)

UNIT I **9**

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

UNIT II **9**

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

UNIT III **9**

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

UNIT IV **9**

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

UNIT V **9**

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

TOTAL HOURS: 45

TEXT BOOKS

1. Dr. S. Bose and Dr.P. Vijayakumar, “Cryptography and Network Security”, First Edition, Pearson Education, 2016.

2.Wade Trappe, Lawrence C Washington, “Introduction to Cryptography with coding theory”, 2nd ed, Pearson, 2007.

2. William Stallings, “Cryptography and Network Security Principles and Practices”, Pearson/PHI, 6th edition, 2013.

REFERENCES

1. W. Mao, “Modern Cryptography – Theory and Practice”, Pearson Education, Second Edition, 2007.

2. Charles P. Pfleeger, Shari Lawrence Pfleeger – Security in computing Third Edition –Prentice Hall of India, 2006.

DATA WAREHOUSING AND MINING

L	T	P	C
3	0	0	3

AIM

To provide an in-depth knowledge of the Data Warehousing and Data Mining and the application. Also make awareness about the recent trends in Data Mining.

OBJECTIVE:

- Distinguish a data warehouse from an operational database system, and appreciate the needs for developing a data warehouse for large corporation;
- Describe the problems and processes involved in the development of a data warehouse;
- Explain the process of data mining and its importance

OUTCOMES:

1.Describe the fundamental concepts, benefits and problem areas associated with datawarehousing

2. Describe the various architectures and main components of a data warehouse.

3. Design a data warehouse, and be able to address issues that arise when implementing a data warehouse.

4. Compare and contrast OLAP and data mining as techniques for extracting knowledge from a data warehouse.

UNIT I INTRODUCTION AND DATA WAREHOUSING 8

Introduction, Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Implementation, Further Development, Data Warehousing to Data Mining

UNIT II DATA PREPROCESSING, LANGUAGE, ARCHITECTURES, CONCEPT DESCRIPTION 8

Why Preprocessing, Cleaning, Integration, Transformation, Reduction, Discretization, Concept Hierarchy Generation, Data Mining Primitives, Query Language, Graphical User Interfaces, Architectures, Concept Description, Data Generalization, Characterizations, Class Comparisons, Descriptive Statistical Measures.

UNIT III ASSOCIATION RULES 9

Association Rule Mining, Single-Dimensional Boolean Association Rules from Transactional Databases, Multi-Level Association Rules from Transaction Databases

UNIT IV CLASSIFICATION AND CLUSTERING 12

Classification and Prediction, Issues, Decision Tree Induction, Bayesian Classification, Association Rule Based, Other Classification Methods, Prediction, Classifier Accuracy, Cluster Analysis, Types of data, Categorization of methods, Partitioning methods, Outlier Analysis.

UNIT V RECENT TRENDS 8

Multidimensional Analysis and Descriptive Mining of Complex Data Objects, Spatial Databases, Multimedia Databases, Time Series and Sequence Data, Text Databases, World Wide Web, Applications and Trends in Data Mining

TOTAL HOURS: 45

TEXT BOOK

1. J. Han, M. Kamber, "Data Mining: Concepts and Techniques", Harcourt India / Morgan Kauffman, 2001.

REFERENCES

1. Margaret H.Dunham, "Data Mining: Introductory and Advanced Topics", Pearson Education 2004.
2. Sam Anahory, Dennis Murry, "Data Warehousing in the real world", Pearson Education 2003.
3. David Hand, Heikki Manila, Padhraic Symth, "Principles of Data Mining", PHI 2004.
4. W.H.Inmon, "Building the Data Warehouse", 3rd Edition, Wiley, 2003.
5. Alex Bezon, Stephen J.Smith, "Data Warehousing, Data Mining & OLAP", MeGraw-Hill Edition, 2001.
6. Paulraj Ponniah, "Data Warehousing Fundamentals", Wiley-Interscience Publication, 2003.

DEVELOPING WEB APPLICATION IN .NET

L	T	P	C
3	0	0	3

AIM

To provide an introduction to the .NET framework

OBJECTIVES

- To create form based and web based applications
- To study the internals of the .NET framework
- To learn about ADO.Net
- To learn about different web services

OUTCOMES:

- Developing, deploying and configuring well-designed.NET based web applications using ASP.NET and AJAX .
- Providing and consuming web services
- Applying best practices in interacting with different data sources and rational databases in a web application, using ADO.NET and LINQ

UNIT I INTRODUCTION **9**

Overview Of .Net-Advantages Of .Net Over Other Languages-Assemblies-.Net Architecture-CLR-Garbage collection.

UNIT II WEB PROGRAMMING CONCEPTS **9**

Introduction to Web Programming-Client / Server Technology-Understanding Web Server IIS

UNIT III I/O AND NETWORK PROGRAMMING **9**

Tracing and events - threading and synchronization - .Net security – localization –Manipulating XML - Managing the file system – basic network programming

UNIT IV ADO.NET **9**

Data Access: ADO.NET Overview - Using Database Connections – Commands - Fast Data Access: The Data Reader - Managing Data and Relationships: The DataSet Class – XML Schemas: Generating Code with XSD – Working with ADO.NET. Windows Forms: Creating a Windows Form Application - Control Class - Standard Controls and Components – Forms. Data Binding: The Data Grid View Control - Data Grid View Class Hierarchy - Data Binding - Visual Studio .NET and Data Access.

UNIT V ASP.NET AND WEB SERVICES **9**

ASP.NET Pages: ASP.NET Introduction - ASP.NET Web Forms - ADO.NET and Data Binding.ASP.NET Development: User and Custom Controls - Master Pages - Site Navigation – Security –Themes - Web Parts. ASP.NET AJAX: What Is Ajax - What Is ASP.NET AJAX - Using ASP.NET AJAX.

TOTAL HOURS: 45

TEXT BOOKS

1. Andrew Troelsen, "C# and the .NET Platform", A! Press, 2005.

REFERNCES

1. Herbert Schildt, "The Complete Reference: C#", Tata McGraw-Hill, 2004.

2. Kevin Hoffman, "Visual C# 2005", Pearson Education, 2006.

DIGITAL IMAGE PROCESSING

L	T	P	C
3	0	0	3

AIM

The aim is to inculcate a basic training in the processing of images for practical applications.

OBJECTIVES

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

COURSE OUTCOMES

- **CO1:** Acquire the fundamental concepts of a digital image processing system.
- **CO2:** Learn different image transforms techniques
- **CO3:** Apply image enhancement techniques.
- **CO4:** Understand the concept of restoration techniques.
- **CO5:** Analyze and compress given images using segmentation techniques.

UNIT I INTRODUCTION TO IMAGE PROCESSING SYSTEMS & IMAGE TRANSFORMS 9

Introduction, Image sampling, Quantization, Resolution, Image file formats, Elements of image processing system, Applications of Digital image processing Introduction, Need for transform, image transforms, Fourier transform, 2 D Discrete Fourier transform, Walsh transform, Hadamard transform, Haar transform, Slant transform, Discrete cosine transform, KL transform, Singular value decomposition, Radon transform, Comparison of different image transforms

UNIT II IMAGE ENHANCEMENT 9

Introduction to image enhancement, Enhancement in spatial domain, Enhancement through point operation, Types of point operation, Histogram manipulation, Linear Gray level transformation, Nonlinear Gray level transformation, Local or neighborhood operation, Median filter, Image sharpening, Bit plane slicing, Image enhancement in the frequency domain.

UNIT III IMAGE RESTORATION 9

Introduction to Image restoration, Image degradation, Types of image blur, Classification of image restoration techniques, Image restoration model, Linear and Nonlinear image restoration techniques, Blind deconvolution

UNIT IV IMAGE SEGMENTATION **9**

Introduction to image segmentation, Classification of segmentation techniques, Region approach to image segmentation, clustering techniques, Image segmentation based on thresholding, Edge based segmentation, Edge detection and linking, Hough transform, Active contour

UNIT V IMAGE COMPRESSION AND COLOUR IMAGE PROCESSING **9**

Introduction, Need for image compression, Redundancy in images, Classification of redundancy in images, image compression scheme, Classification of image compression schemes, Run length coding, Shannon – Fano coding, Huffman coding, Arithmetic coding, Predictive coding, Transformed based compression, Image compression standard, Wavelet-based image compression Introduction to Colour Image processing, Light and colour, colour formation, Human perception of colour, colour model. The chromaticity diagram, colour image quantization, Histogram of colour image, colour image filtering, Gamma correction of a colour image, colour image segmentation

TOTAL HOURS: 45

TEXTBOOKS

1. Rafael C. Gonzalez, Richard E. Woods, ‘Digital Image Processing', Pearson Education, India, 2009

2. Anil K. Jain, ‘Fundamentals of Digital Image Processing', Pearson 2002.

3. S.Jayaraman, S.Esakkirajan and T.VeeraKumar, “Digital Image processing”, Tata Mc Graw Hill publishers, 2009

REFERENCE BOOKS

1. Kenneth R. Castleman, ‘Digital Image Processing’, Pearson, 2006.

2. Rafael C. Gonzalez, Richard E. Woods, Steven Eddins, ‘Digital Image Processing using MATLAB', Pearson Education, Inc., 2004.

3. D.E.Dudgeon and RM. Mersereau, ‘Multidimensional Digital Signal Processing', Prentice Hall Professional Technical Reference, 1990.

4. William K. Pratt, ‘Digital Image Processing’, John Wiley, New York, 2002

5. Milan Sonka et aI, 'Image Processing, Analysis and Machine Vision', Brookes/Cole, Vikas Publishing House, 2nd edition, 1999,

6. John W.Woods, “Multidimensional Signal, Image and Video Processing and Coding”, Elsevier Academic Press Publications2006, ISBN-13: 978-0-12– 088516-9.

DISTRIBUTED SYSTEMS

L	T	P	C
3	0	0	3

AIM

The aim of the course is to convey an insight into the fundamental concepts,principles, and state-of-the-art practice underlying the design of distributed systems.

OBJECTIVES

- To introduce basic concepts of communication.
- To learn about distributed operating systems
- To learn about fault tolerance systems

COURSE OUTCOME

- Understand distributed system and Computing
- Analysis why you would design a distributed system , what the desired properties of such systems are and list the principles underlying the functioning of distributed systems, describe the problems and challenges associated with these principles, and evaluate the effectiveness and shortcomings of their solutions;
- Remember what are the issues in operating systems for distributed systems while designing the distributed systems
- Apply distributed Transaction process such as locking and deadlock in distributed systems
- Create distributed system software using various methods, strategies, and fault tolerance techniques presented in the course

UNIT I COMMUNICATION IN DISTRIBUTED ENVIRONMENT 8

Introduction – Various Paradigms in Distributed Applications – Remote Procedure Call – Remote Object Invocation – Message-Oriented Communication – Unicasting, Multicasting and Broadcasting – Group Communication.

UNIT II DISTRIBUTED OPERATING SYSTEMS 12

Issues in Distributed Operating System – Threads in Distributed Systems – Clock Synchronization – Causal Ordering – Global States – Election Algorithms –Distributed Mutual Exclusion – Distributed Transactions – Distributed Deadlock – Agreement Protocols .

UNIT III DISTRIBUTED RESOURCE MANAGEMENT 10

Distributed Shared Memory – Data-Centric Consistency Models – Client-Centric Consistency Models – Ivy – Munin – Distributed Scheduling – Distributed File Systems – Sun NFS.

UNIT IV FAULT TOLERANCE AND CONSENSUS **7**

Introduction to Fault Tolerance – Distributed Commit Protocols – Byzantine Fault Tolerance – Impossibilities in Fault Tolerance.

UNIT V CASE STUDIES **8**

Distributed Object-Based System – CORBA – COM+ – Distributed Coordination-Based System – JINI.

TOTAL HOURS: 45

TEXT BOOKS

1. George Coulouris, Jean Dollimore, Tim Kindberg, "Distributed Systems Concepts and Design", Third Edition, Pearson Education Asia, 2002.

2. Hagit Attiya and Jennifer Welch, "Distributed Computing: Fundamentals, Simulations and Advanced Topics", Wiley, 2004.

REFERENCES

1. Mukesh Singhal, "Advanced Concepts In Operating Systems", McGrawHill Series in Computer Science, 1994.

2. A.S.Tanenbaum, M.Van Steen, "Distributed Systems", Pearson Education,2004.

3. M.L.Liu, "Distributed Computing Principles and Applications", Pearson Addison Wesley, 2004.

ESSENTIALS OF INFORMATION TECHNOLOGY

L	T	P	C
3	0	0	3

AIM

The aim of the course is to convey the essentials of information technology to the students.

OBJECTIVES

- To introduce basic concepts of scripting.
- To learn about the internet protocols
- To learn about mobile communication

OUTCOMES:

- Enhance your effectiveness.
- Confidently understand the bigger picture.
- Demonstrate your value to your organization.

UNIT-I WEB ESSENTIALS **9**

Creating a website-working principle of website-parts of a web address- browser fundamentals-authoring tools-types of servers: application server-web server-database server- social networks.

UNIT-II SCRIPTING ESSENTIALS **9**

Need for scripting languages- types of scripting languages-client side scripting- server side scripting-PHP- working principle of PHP- PHP variables- constants-operators-flow control and looping- arrays-strings-functions-file handling-PHP and MySQL- PHP and HTML-cookies-simple PHP scripts.

UNIT-III NETWORKING ESSENTIALS **9**

Fundamental computer network concepts- type of computer networks- network equipments-ethernet-wireless local area network-internet service-TCP/IP-And other internet protocols-network routing-switching and bridging.

UNIT-IV MOBILE COMMUNICATION ESSENTIALS **9**

Cell phone working fundamentals-cell phone frequencies-cell phone channels-cell phone codes-digital cell phone components- cell phone network technologies- cell phone towers- problems with cell phones and maintenance.

UNIT-V APPLICATION ESSENTIALS **9**

Creation of simple interactive applications-simple database applications- multimedia applications- design and development of information systems- personal information system- information retrieval system-social networking applications.

TOTAL HOURS: 45

TEXT BOOKS

1. Luke Welling, Laura Thomson, “PHP and MySQL web development (4th edition)”, Pearson Education, 2009.

2. Preston Gralla, “How the internet works (8th edition):, Que .,2006

3. Preston Gralla, Eric Lindley, “How wireless works (2nd edition)”, Que,. 2005.

REFERENCE

1.Robin Nixon, “Learning PHP,MySQL &Java Script”,O.Reilly 2009.

GRID COMPUTING

L	T	P	C
3	0	0	3

AIM

The aim of the course is to make the students learn about grid computing.

OBJECTIVES

- To introduce the architecture of a grid.
- To learn about grid monitoring.
- To learn about the middlewares.

OUTCOME

1. To understand the genesis of grid computing
2. To know the application of grid computing
3. To learn the technology and tool kits for facilitating grid computing

UNIT I CONCEPTS AND ARCHITECTURE 9

Introduction-Parallel and Distributed Computing-Cluster Computing-Grid Computing- Anatomy and Physiology of Grid-Review of Web Services-OGSA-WSRF.

UNIT II GRID MONITORING 9

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

UNIT III GRID SECURITY AND RESOURCE MANAGEMENT 9

Grid Security-A Brief Security Primer-PKI-X509 Certificates-Grid Security-Grid Scheduling and Resource Management-Scheduling Paradigms- Working principles of Scheduling -A Review of Condor, SGE, PBS and LSF-Grid Scheduling with QoS.

UNIT IV DATA MANAGEMENT AND GRID PORTALS 9

Data Management-Categories and Origins of Structured Data-Data Management Challenges-Architectural Approaches-Collective Data Management Services-Federation Services-Grid Portals-First-Generation Grid Portals-Second-Generation Grid Portals.

UNIT V GRID MIDDLEWARE 9

List of globally available Middlewares - Case Studies-Recent version of Globus Toolkit and gLite - Architecture, Components and Features.

TOTAL HOURS: 45

TEXT BOOKS

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

REFERENCES

1. Ian Foster & Carl Kesselman, The Grid 2 – Blueprint for a New Computing Infrastructure, Morgan Kaufman, 2004.

2. Joshy Joseph & Craig Fellenstein, "Grid Computing", Pearson Education 2004.

3. Fran Berman, Geoffrey Fox, Anthony J.G. Hey, "Grid Computing: Making the Global Infrastructure a reality", John Wiley and sons, 2000, UNIT III.

HIGH SPEED NETWORKS

L	T	P	C
3	0	0	3

AIM

To understand about high speed networks.

OBJECTIVE:

- To introduce basic concepts of high speed networks
- To learn about traffic management
- To learn about congestion control in networks

COURSE OUTCOMES:

At the end of this course students will be able understand High speed networks , wireless network operation and also covers security and Network management aspects

UNIT I HIGH SPEED NETWORKS **9**

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

UNIT II CONGESTION AND TRAFFIC MANAGEMENT **9**

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

UNIT III TCP AND ATM CONGESTION CONTROL **9**

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

UNIT IV INTEGRATED AND DIFFERENTIATED SERVICES **9**

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

UNIT V PROTOCOLS FOR QOS SUPPORT 9

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

TOTAL HOURS: 45

TEXT BOOKS

1. William Stallings, "HIGH SPEED NETWORKS AND INTERNET", Pearson 1. Education, Second Edition, 2002.

REFERENCES

1. Warland & Pravin Varaiya, "HIGH PERFORMANCE COMMUNICATION NETWORKS", Jean Harcourt Asia Pvt. Ltd., II Edition, 2001.

2. Irvan Pepelnjk, Jim Guichard and Jeff Apcar, "MPLS and VPN architecture", Cisco Press, Volume 1 and 2, 2003.

INTERNET AND WEB TECHNOLOGY

L	T	P	C
3	0	0	3

AIM

To understand the concepts of internet and web technology.

OBJECTIVE

- To introduce basic concepts of internet
- To learn about HTML & XML
- To learn about internet security

OUTCOMES:

1. Analyze a web page and identify its elements and attributes.
2. Create web pages using XHTML and Cascading Styles sheets.
3. Build dynamic web pages using JavaScript (client side programming).
4. Write non-trivial programs using C#.
5. Build interactive web applications using ASP.NET and C#.

UNIT-I INTRODUCTION TO INTERNET **9**

Introduction, Evolution of Internet, Internet Applications, Internet Protocol -TCP/IP, UDP, HTTP, Secure Http(Shttp) Internet Addressing – Addressing Scheme – Ipv4 & IPv6, Network Byte Order, Domain Name Server and IP Addresses, Mapping . Internet Service Providers, Types Of Connectivity Such As Dial-Up Leaded Vsat Etc. Web Technologies: Three Tier Web Based Architecture; Jsp, Asp, J2ee, .Net Systems

UNIT-II HTML CSS AND SCRIPTING **9**

HTML – Introduction, Sgml, Dtd(Document Type Definition, Basic Html Elements, Tags and usages, HTML Standards , Issues in HTML Dhtml: Introduction Cascading Style Sheets: Syntax ,Class Selector, Id Selector Dom (Document Object Model) & Dso (Data Source Object) Approaches To Dynamic Pages: Cgi, Java Applets, Plug Ins, Active X, Java Script – Java Script Object Model, Variables-Constant – Expressions, Conditions- Relational Operators- Data Types – Flow Control – Functions & Objects-events and event handlers – Data type Conversion & Equality – Accessing HTML form elements

UNIT-III XML **9**

What is XML – Basic Standards, Schema Standards, Linking & Presentation Standards, Standards that build on XML, Generating XML data, Writing a simple XML File, Creating a Document type definition, Documents & Data ,Defining Attributes & Entities in the DTD ,Defining Parameter Entities &

conditional Sections, Resolving a naming conflict, Using Namespaces, Designing an XML data structure, Normalizing Data, Normalizing DTDS

UNIT-IV INTERNET SECURITY & FIREWALLS 9

Security Threats From Mobile Codes, Types Of Viruses, Client Server Security Threats, Data & Message Security, Various electronic payment systems, Introduction to EDI,Challenges–Response System, Encrypted Documents And Emails , Firewalls: Hardened Firewall Hosts, Ip- Packet Screening, Proxy Application Gateways, Aaa (Authentication ,Authorization And Accounting).

UNIT-V WEBSITE PLANNING & HOSTING 9

Introduction, Web Page Lay-Outing, Where To Host Site, Maintenance Of Site, Registration Of Site On Search Engines And Indexes, Introduction To File Transfer Protocol, Public Domain Software, Types Of Ftp Servers (Including Anonymous),FtpClients Common Command. Telnet Protocol, Server Domain, Telnet Client, Terminal Emulation. Usenet And Internet Relay Chat

TOTAL HOURS: 45

TEXT BOOKS

1. Internet & Intranet Engineering,- Daniel Minoli, TMH.

2 .Alexis Leon and Mathews Leon – Internet for Every One, Tech World.

REFERENCES

1. Eric Ladd, Jim O'Donnel –"Using HTML 4, XML and JAVA"-Prentice Hall of India -1999.

2. "Beginning Java Script "– Paul Wilton – SPD Publications –2001.

INTRODUCTION TO MAINFRAMES

L	T	P	C
3	0	0	3

AIM

To have an introduction to mainframes.

OBJECTIVES

- To get an idea about the mainframe hardware
- To get an idea about z/OS
- To learn about JCL

OUTCOMES:

1.Understand the importance of Legacy System.

2. Role of Mainframes in infrastructure of a medium to large IT organization.

3. Understand the different components of Mainframe Technology.

4. Learn the best practices for designing applications using Mainframe Technology.

UNIT –I EVOLUTION OF MAINFRAME HARDWARE **9**

Overview of Computer Architecture - Classification of Computers - micro, mini, mainframes and super computer – Mainframe computer - key features - benefits - Evolution of Mainframes - Different hardware systems. Mainframes OS and Terminology: Operating systems on mainframes, Batch processing vs. online processing - mainframe operating system. - evolution - concepts of Address space, Buffer management - Virtual storage - paging - swapping – Dataset management in mainframes.

UNIT-II Z/OS AND ITS FEATURES **9**

Z-operating system (Z/OS) - Virtual storage - Paging process - storage Managers - Program execution modes - Address space - Multiple virtual system(MVS) , MVS address space, Z/OS address space - Dataset - sequential and partial dataset - Direct access storage device(DASD) -Access methods - Record formats - Introduction to virtual storage access methods(VSAM) - Catalog – VTOC.

UNIT-III INTRODUCTION TO JCL **9**

Introduction to Job Control language - Job processing – structure of JCL statements - Various statements in JCL - JOB statement - EXEC statement – DD statement - JCL procedures and IBM utility programs.

UNIT-IV COBOL PROGRAMMING **9**

Introduction – History, evolution and Features, COBOL program Structure, steps in executing COBOL. Language Fundamentals – Divisions, sections, paragraphs, sections, sentences and statements, character set, literals, words, figurative constants, rules for forming user defined words, COBOL coding sheet.. Data division – Data names, level numbers, PIC and VALUE clause, REDEIFNES, RENAMES and

USAGE clause. Procedure Division – Input / Output verbs, INITIALIZE verb, data movement verbs, arithmetic verbs, sequence control verbs.

UNIT-V OVERVIEW OF DB2 **9**

Introduction to DB2 – System Service component, Database Service component, Locking Service component, Distributed Data Facility Services component, Stored Procedure component, catalogs and optimizer. DB2 Objects and Data Types - DB2 Objects Hierarchy, Storage groups, Database, Table space, Table, Index, Clustered index, Synonyms and aliases, Views, Data Types. DB2 SQL programming – Types of SQL statements, DCL, DDL, DML, SPUFI utility. Embedded SQL programming – Host variable, DECLGEN utility, SQLCA, single/multiple row manipulation, cursors, and scrollable cursors.

TOTAL HOURS: 45

REFERENCES

1. MVS JCL, Doug Lowe, Mike Murach and Associates.

2. AS/400 Architecture and Application – The Database Machine by Jill T. Lawrence (SPD Publications)

3. Gary DeWard Brown, JCL Programming Bible (with z/OS) fifth edition, Wiley India Dream Tech, 2002.

4.z/OS V1R4.0 MVS JCL Reference found online at

http://www-.ibm.com/support/docview.wss?uid=pub1sa22759706

5.z/OS V1R1.0 MVS JCL Reference found online at

http://publibz.boulder.ibm.com/cgibin/bookmgr_OS390/BOOKS/iea2b600/CCONTENTS

6. COBOL - Language Reference, Ver 3, Release 2, IBM Redbook.

7. COBOL - Programming Guide, Ver 3, Release 2, IBM Redbook.

8. Complete CL The Definitive Control Language Programming Guide by Ted Holt and Ernie Malaga (SPD Publication).

9. Nancy Stern & Robert A Stern, "Structured Cobol Programming", John Wiley & Sons, New York, 1973.

10. M.K. Roy and D. Ghosh Dastidar, "Cobol Programming", Tata McGraw Hill, New York, 1973.

11. Newcomer and Lawrence, Programming with Structured COBOL, McGraw Hill Books, New York, 1973.

12. Craig S Mullins, DB2 Developer's Guide, Sams Publishing, 1992.

13. Gabrielle Wiorkowski & David Kull, DB2 Design & Development Guide, Addison Wesley, 1992.

14. C J Date & Colin J White, A Guide to DB2, Addison Wesley.

KNOWLEDGE BASED DECISION SUPPORT SYSTEMS

L	T	P	C
3	0	0	3

AIM

To learn about knowledge based decision support systems.

OBJECTIVES

- To get an idea about decision support systems
- To get an idea about intelligent support systems.

OUTCOMES:

Management Support systems
Business Intelligence
Collaborative computing technologies
Intelligent decision support system

UNIT I **9**

Decision Making and computerized support: Management support systems. Decision making systems modeling- support.

UNIT II **9**

Decision Making Systems – Modeling and Analysis – Business Intelligence – Data Warehousing, Data Acquisition - Data Mining. Business Analysis – Visualization - Decision Support System Development.

UNIT III **9**

Collaboration, Communicate Enterprise Decision Support System & Knowledge management – Collaboration Com Technologies Enterprise information system – knowledge management.

UNIT IV **9**

Intelligent Support Systems – AI & Expert Systems – Knowledge based Systems – Knowledge Acquisition, Representation & Reasoning, Advanced intelligence system – Intelligence System over internet.

UNIT V **9**

Implementing MSS in the E-Business ERA – Electronic Commerce–integration, Impacts and the future management support systems.

TOTAL HOURS: 45

TEXT BOOKS

1. Decision Support Systems & Intelligent Systems – Seventh edition Efraim Turban & Jay E. Aronson Ting-Peng Liang - Pearson/prentice Hall.

2. Decision support Systems – Second Edition – George M Marakas - Pearson/prentice Hall.

REFERENCES

1. Decision Support systems and Data warehouse Systems by Efrem G Mallach- Mc Graw Hill.

LEARNING IT ESSENTIALS BY DOING

L	T	P	C
3	0	0	3

AIM

To learn about the essentials of Information Technology.

OBJECTIVES

- To get an idea about the scripting languages.
- To get an idea about the internet protocols

OUTCOMES:

1. Enabling Knowledge
2. Problem Solving
3. Communication
4. Team Work
5. Responsibility

UNIT-I WEB ESSENTIALS **9**

Creating a website-working principle of website-parts of a web address- browser fundamentals-authoring tools-types of servers: application server-web server-database server- social networks.

UNIT-II SCRIPTING ESSENTIALS **9**

Need for scripting languages- types of scripting languages-client side scripting- server side scripting-PHP- working principle of PHP- PHP variables- constants-operators-flow control and looping- arrays-strings-functions-file handling-PHP and MySQL- PHP and HTML-cookies-simple PHP scripts.

UNIT-III NETWORKING ESSENTIALS **9**

Fundamental computer network concepts- types of computer networks- network equipments-ethernet-wireless local area network-internet service-TCP/IP-And other internet protocols-network routing-switching and bridging.

UNIT-IV MOBILE COMMUNICATION ESSENTIALS **9**

Cell phone working fundamentals-cell phone frequencies-cell phone channels-cell phone codes-digital cell phone components- cell phone network technologies- cell phone towers- problems with cell phones and maintenance.

UNIT-V APPLICATION ESSENTIALS **9**

Creation of simple interactive applications-simple database applications- multimedia applications- design and development of information systems- personal information system- information retrieval system-social networking applications.

TOTAL HOURS: 45

TEXT BOOKS

1.Luke Welling, Laura Thomson, "PHP and MySQL web development(4th edition)", Pearson Education, 2009.

2.Preston Gralla, "How the internet works(8th edition):, Que .,2006

3.Preston Gralla, Eric Lindley, "How wireless works(2nd edition)", Que,. 2005.

REFERENCES

1.Robin Nixon, "Learning PHP,MySQL &Java Script",O.Reilly 2009.

MOBILE ADHOC NETWORK

L	T	P	C
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AIM

To learn about mobile adhoc networks.

OBJECTIVE

- To get an idea about adhoc networks.
- To get an idea about MAC protocols.
- To get an idea about end to end delivery and security.

OUTCOMES:

- To understand the routing algorithm used mobile adhoc network
- To understand the Transport protocol of mobile adhoc network
- To understand the security mechanism used in mobile adhoc network
- To understand the quality of service .

UNIT I INTRODUCTION **9**

Introduction to adhoc networks – definition, characteristics features, applications. Characteristics of Wireless channel, Adhoc Mobility Models:- Indoor and outdoor models.

UNIT II MEDIUM ACCESS PROTOCOLS **9**

MAC Protocols: design issues, goals and classification. Contention based protocols- with reservation, scheduling algorithms, protocols using directional antennas. IEEE standards: 802.11a, 802.11b, 802.11g, 802.15. HIPERLAN.

UNIT III NETWORK PROTOCOLS **9**

Routing Protocols: Design issues, goals and classification. Proactive Vs reactive routing, Unicast routing algorithms, Multicast routing algorithms, hybrid routing algorithm, Energy aware routing algorithm, Hierarchical Routing, QoS aware routing.

UNIT IV END-END DELIVERY AND SECURITY **9**

Transport layer : Issues in desiging- Transport layer classification, adhoc transport protocols. Security issues in adhoc networks: issues and challenges, network security attacks, secure routing protocols.

UNIT V CROSS LAYER DESIGN AND INTEGRATION OF ADHOC FOR 4G **9**

Cross layer Design: Need for cross layer design, cross layer optimization, parameter optimization techniques, Cross layer cautionary prespective. Intergration of adhoc with Mobile IP networks.

TOTAL HOURS: 45

TEXT BOOKS

1. C.Siva Ram Murthy and B.S.Manoj, Ad hoc Wireless Networks Architectures and protocols, 2

2. Charles E. Perkins, Ad hoc Networking, Addison – Wesley, 2000 nd edition, Pearson Education. 2007

REFERENCES

1. Stefano Basagni, Marco Conti, Silvia Giordano and Ivan stojmenovic, Mobilead hoc networking, Wiley-IEEE press, 2004.

2. Mohammad Ilyas, The handbook of adhoc wireless networks, CRC press, 2002.

MOBILE APPLICATION DEVELOPMENT

L	T	P	C
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AIM

To learn about mobile application development.

OBJECTIVES

- Understand system requirements for mobile applications
- Generate suitable design using specific mobile development frameworks
- Generate mobile application design
- Implement the design using specific mobile development frameworks
- Deploy the mobile applications in marketplace for distribution

OUTCOMES:

- COL1: **Describe** and **compare** different mobile application models/architectures and patterns.
- CLO 2: **Apply** mobile application models/architectures and patterns to the development of a mobile software application.
- CLO 3: **Describe** the components and structure of a mobile development framework (Google's Android Studio).
- CLO 4: **Apply** a mobile development framework to the development of a mobile application.
- CLO 5: **Demonstrate** advanced Java programming competency by developing a maintainable and efficient cloud based mobile application.
- CLO 6: **Address** the limitations and challenges of working in a mobile environment and thus **utilise** the opportunities for commercial and/or social benefit.

UNIT I INTRODUCTION **9**

Introduction to mobile applications –Embedded systems -Market and business drivers for mobile applications –Publishing and delivery of mobile applications –Requirements gathering and validation for mobile applications

UNIT II BASIC DESIGN **9**

Introduction –Basics of embedded systems design –Embedded OS -Design constraints for mobile applications, both hardware and software related –Architecting mobile applications –User interfaces for mobile applications –touch events and gestures –Achieving quality constraints –performance, usability, security, availability and modifiability.

UNIT III ADVANCED DESIGN **9**

Designing applications with multimedia and web access capabilities – Integration with GPS and social media networking applications – Accessing applications hosted in a cloud computing environment – Design patterns for mobile applications.

UNIT IV TECHNOLOGY I – ANDROID **9**

Introduction – Establishing the development environment – Android architecture – Activities and views –Interacting with UI –Persisting data using SQLite–Packaging and deployment –Interaction with server side applications –Using Google Maps, GPS and Wifi –Integration with social media applications.

UNIT V TECHNOLOGY II –IOS **9**

Introduction to Objective C –iOS features –UI implementation –Touch frameworks –Data persistence using Core Data and SQLite –Location aware applications using Core Location and Map Kit –Integrating calendar and address book with social media application –Using Wifi -iPhone marketplace.

TOTAL HOURS: 45

TEXT BOOKS

1. Jeff McWherter and Scott Gowell, "Professional Mobile Application Development", Wrox, 2012.

REFERENCES

1. Charlie Collins, Michael Galpin and Matthias Kappler, “Android in Practice”, DreamTech, 2012.

2. James Dovey and Ash Furrow, “Beginning Objective C”, Apress, 2012.

3. David Mark, Jack Nutting, Jeff LaMarche and Frederic Olsson, “Beginning iOS 6 Development: Exploring the iOS SDK”, Apress, 2013.

MULTIMEDIA MINING

L	T	P	C
3	0	0	3

OBJECTIVES:

- To introduce the basics of multimedia information storage technology, techniques for analysis,
- representation and retrieval that is commonly used in industry.
- To compare and contrast information retrieval models and internal mechanisms such as
- Boolean, Probability, and Vector Space Models.
- To outline the structure of queries and media elements.
- To critically evaluate Multimedia retrieval system effectiveness and improvement techniques

OUTCOMES:

- The large amounts of multimedia data on the Web have to managed and mined. Therefore, effective multimedia data management and mining techniques for the Web are needed.
- For applications such as e-commerce and e-busi-ness, it is necessary to manage not only text but also other types of data such asimages, video, and audio.
- Addresses the important topic of managing and mining multimedia databases on the Web.

UNIT I MULTIMEDIA STORAGE **9**

Introduction To Multimedia Storage Devices Compact Disc – Construction Details – Recording and Reproducing Data From CD, CDROM - DVD Technology – Specifications of DVD - Introduction to Visual Information Retrieval – Content Based Interactivity – Representation of Visual Contents – Similarity Models – Indexing Models – Data Models and Knowledge Structures – Visual Information Retrieval at Work – Introduction To Ad– Hoc Search Boolean Retrieval.

UNIT II TEXTUAL INFORMATION RETRIEVAL **9**

Textual Information Retrieval Fundamentals of IR – Search structure – Text analysis and indexing – Clustering of Documents – Index Construction – Text Representation – Evaluation – Retrieval models - Vector space – Probabilistic models – Statistical language models – Structured Documents – Inference Network – Personalized and topic sensitive Page Rank – Query classification – Federated Search – Document clustering –Collaborative filtering.

UNIT III IMAGE RETRIEVAL **9**

Image Retrieval by Color Similarity Representation of Color Stimuli – Representation of Image Color Properties – Color based Retrieval – Image Retrieval by Texture Similarity – Representation of Texture Properties, Space based Models – Frequency based Models – Texture Signatures –Image Retrieval by Shape Similarity - Shape Representation – Shape through Features – Multi scale Shape Description – Shape Based Retrieval –Feature based Methods – Image Retrieval by Spatial Relationships - Representation of Spatial Indexes – Object based Representation -Relation based Representation – Metric Relationships (Distance, Orientations) – Querying and Retrieval by Spatial Relationships.

UNIT IV MUSIC AND VIDEO RETRIEVAL **9**

Content Based Music Retrieval - Symbolic Representation for Music information retrieval –Melody Segmentation – Melodic similarity – Music indexing – Query and Retrieval and content analysis - Content Based Video Retrieval - Video Segmentation into Shots – Video Segmentation into Shot Aggregates – Video Annotation – Accessing Video Content – Content based video indexing and retrieval techniques – Video scene analysis.

UNIT V RETRIEVAL METRICS **9**

Average recall and average precision - Harmonic mean - Evaluation of a search engine –Relevance Issue – Kappa Measure – Quality versus Quantity, possible factors which influence outcome of a search – Grandfield Experimental Study.

TOTAL HOURS: 45

REFERENCES

1. Zhang, Y.J. “Semantic Based Visual Information Retrieval”, IGI Global, 2006.

2. Tse, P.K.C. “Multimedia Information Storage and Retrieval Techniques and Technologies”, IGI Global, 2008.

3. Christopher D. Manning, Prabhakar Raghavan, and Hinrich Schutze “Introduction to Information Retrieval”, Cambridge University Press. 2008.

4. Bimbo, A., "visual Information Retrieval“, Morgan Kaufmann, 1999.

5. Maybury, M., “Intelligent Multimedia Information Retrieval”, MIT Press, 1997.

6. Subrahmanian, V. and Jajodia, S., “Multimedia Database Systems”, Springer, 1996.

7. Smeulders, A. and Jain, R., “Image Database and Multimedia Search, World Scientific”, 1997.

NANO TECHNOLOGY

L	T	P	C
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AIM

To understand about nano technology.

OBJECTIVES

- To learn about the fundamentals of nano science.
- To learn about the nano materials.

OUTCOMES:

- An ability to apply knowledge of mathematics, science, and engineering
- An ability to design and conduct experiments, as well as to analyze and interpret data
- An ability to design a system, component, or process to meet desired need within realistic constraints such as economic, environmental, social, political,ethical, health and safety, manufacturability, and sustainability
- An ability to function on multidisciplinary teams

UNIT-I FUNDAMENTALS AND OVERVIEW OF NANOSCIENCE 9

Nanorevolution of the XX century, Properties at nanoscale (optical, electronic and magnetic). Theory, definitions and scaling.

UNIT-II DIFFERENT CLASSES OF NANOMATERIALS 9

Metal and Semiconductor Nanomaterials, Quantum Dots, Wells and Wires, Molecule to bulk transitions Bucky balls and Carbon Nanotubes.

UNIT-III SYNTHESIS OF NANOMATERIALS 9

Top-down (Nanolithography, CVD),Bottom-up (Sol-get processing, chemical synthesis). Wet Depositiontechniques, Self-assembly (Supramolecular approach), Molecular design and modeling.

UNIT-IV CHARACTERIZATION 9

TEM, SEM and SPM technique, Fluorescence Microscopy and Imaging.

UNIT-V APPLICATIONS 9

Solar energy conversion and catalysis, Molecular electronics and printed electronics Nanoelectronics,Polymers with a special architecture, Liquid crystalline systems,Linear and nonlinear optical and electrooptical properties, Applications in displays and other devices, Advanced organic materials for data storage,Photonics, Plasmonics ,Chemical and biosensors,Nanomedicine and Nanobiotechnology.

TOTAL HOURS: 45

TEXT BOOKS

1.Hari Singh Nalwa, “Nano structured Materials and Nanotechnology”, Academic Press, 2002.

REFERENCES

1. A.Nabok, “Organic and Inorganic Nanostructures”, Artech House, 2005.

2. C.Dupas, P.Houdy, M.Lahmani, Nanoscience: “Nanotechnologies and Nanophysics”, Springer-Verlag Berlin Heidelberg, 2007.

OPEN SOURCE SYSTEMS

L	T	P	C
3	0	0	3

AIM

The student will get exposure to operating system and networking concepts.

OBJECTIVES

- To learn about GNU/Linux based servers and workstation
- To learn shell programming
- To learn about application and server software
- To learn free and open source components.

OUTCOME:

1. Explain common open source licenses and the impact of choosing a license
2. Explain open source project structure and how to successfully setup a project
3. Be competent with distributed software engineering tools and processes such as test-driven development, issues tracking, unit testing, code review, distributed version control, and continuous integration

Unit I **9**

Overview of Free/Open Source Software-- Definition of FOSS & GNU, History of GNU/Linux and the Free Software Movement , Advantages of Free Software and GNU/Linux, FOSS usage , trends and potential—global and Indian. GNU/Linux OS installation-- detect hardware, configure disk partitions & file systems and install a GNU/Linux distribution ; Basic shell commands - logging in, listing files, editing files, copying/moving files, viewing file contents, changing file modes and permissions, process management ; User and group management, file ownerships and permissions, PAM authentication ; Introduction to common system configuration files & log files ; Configuring networking, basics of TCP/IP networking and routing, connecting to the Internet (through dialup, DSL, Ethernet, leased line).

Unit II **9**

Configuring additional hardware - sound cards, displays & display cards, network cards, modems, USB drives, CD writers ; Understanding the OS boot up process; Performing every day tasks using gnu/Linux -- accessing the Internet, playing music, editing documents and spreadsheets, sending and receiving email, copy files from disks and over the network, playing games, writing CDs ; X Window system configuration and utilities -- configure X windows, detect display devices ; Installing software -- from source code as well as using binary packages. Setting up email servers-- using postfix

(SMTP services), courier (IMAP & POP3 services), squirrel mail (web mail services) ; Setting up web servers -- using apache (HTTP services), php (server-side scripting), perl (CGI support) ; Setting up file services -- using samba (file and authentication services for windows networks), using NFS (file services for gnu/Linux / Unix networks) ; Setting up proxy services -- using squid (http / ftp / https proxy services) ; Setting up printer services - using CUPS (print spooler), foomatic (printer database)

Unit III **9**

Setting up a firewall - Using netfilter and ip tables; Using the GNU Compiler Collection – GNU compiler tools ; the C preprocessor (cpp), the C compiler (gcc) and the C++ compiler (g++), assembler (gas) ; Understanding build systems -- constructing make files and using make, using autoconf and autogen to automatically generate make files tailored for different development environments ; Using source code versioning and management tools -- using CVS to manage source code revisions, patch & diff.

Unit IV **9**

Understanding the GNU Libc libraries and linker -- linking against object archives (.a libraries) and dynamic shared object libraries (.so libraries), generating statically linked binaries and libraries, generating dynamically linked libraries ; Using the GNU debugging tools -- gdb to debug programs, graphical debuggers like ddd, memory debugging / profiling libraries mpatrol and valgrind ; Review of common programming practices and guidelines for GNU/Linux and FOSS ; Introduction to Bash, sed & awk scripting. Basics of the X Windows server architecture.

Unit V **9**

Basics of the X Windows server architecture ; Qt Programming ; Gtk+ Programming ; Python Programming ; Programming GUI applications with localization support.

TOTAL HOURS: 45

REFERENCES BOOKS:

1. N. B. Venkateshwarlu (Ed); Introduction to Linux: Installation and Programming, B S Publishers; 2005.

2.Matt Welsh, Matthias Kalle Dalheimer, Terry Dawson, and Lar Kaufman, Running Linux, Fourth Edition, O'Reilly Publishers, 2002,

3. Carla Schroder, Linux Cookbook, First Edition, O'Reilly Cookbooks Series, 2004.

REAL TIME SYSTEMS

L	T	P	C
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AIM

To learn about real time systems.

OBJECTIVES

- To learn about the issues in real time computing
- To learn about the structure of real time systems
- To learn about real time databases.

OUTCOMES:

1.Characterise real-time systems and describe their functions.
2. Analyse, design and implement a real-time system.
3. Apply formal methods to the analysis and design of real-time systems.
4. Apply formal methods for scheduling real-time systems.
5. Characterise and debug a real-time system.

UNIT I INTRODUCTION 9

Introduction - Issues in Real Time Computing, Structure of a Real Time System. Task Classes, Performance Measures for Real Time Systems, Estimating Program Run times. Task Assignment and Scheduling - Classical Uniprocessor scheduling algorithms, UniProcessor scheduling of IRIS Tasks, Task Assignment, Mode Changes, and Fault Tolerant Scheduling.

UNIT II PROGRAMMING LANGUAGES AND TOOLS 9

Programming Language and Tools – Desired Language characteristics, Data Typing, Control structures, Facilitating Hierarchical Decomposition, Packages, Run-time (Exception) Error handling, Overloading and Generics, Multitasking, Low Level programming, Task scheduling, Timing Specifications, Programming Environments, Run-time Support.

UNIT III REAL TIME DATABASES 9

Real time Databases - Basic Definition, Real time Vs General Purpose Databases, Main Memory Databases, Transaction priorities, Transaction Aborts, Concurrency Control Issues, Disk Scheduling Algorithms, Two-phase Approach to improve Predictability, Maintaining Serialization Consistency, Databases for Hard Real Time systems.

UNIT IV COMMUNICATION 9

Real-Time Communication - Communications Media, Network Topologies Protocols, Fault Tolerant Routing. Fault Tolerance Techniques - Fault Types, Fault Detection. Fault Error containment Redundancy, Data Diversity, Reversal Checks, Integrated Failure handling.

UNIT V EVALUATION TECHNIQUES 9

Reliability Evaluation Techniques - Obtaining Parameter Values, Reliability Models for Hardware Redundancy, Software Error models. Clock Synchronization - Clock, A Nonfault-Tolerant Synchronization Algorithm, Impact of Faults, Fault Tolerant Synchronization in Hardware, Fault Tolerant Synchronization in Software.

TOTAL HOURS: 45

TEXT BOOKS

1. C.M. Krishna, Kang G. Shin, "Real-Time Systems", McGraw-Hill International Editions, 1997.

REFERENCES

1. Stuart Bennett, "Real Time Computer Control-An Introduction", Second edition Prentice Hall PTR, 1994.

2. Peter D. Lawrence, "Real time Micro Computer System Design – An Introduction", McGraw Hill, 1988.

3. S.T. Allworth and R.N. Zobel, "Introduction to real time software design", Macmillan, II Edition, 1987.

4. R.J.A Buhur, D.L. Bailey, "An Introduction to Real-Time Systems", Prentice-Hall. International, 1999.

5. Philip.A.Laplante "Real Time System Design and Analysis" PHI , III Edition, April 2004.

SOFT COMPUTING

L	T	P	C
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AIM

To give an overall understanding on the theories that are available to solve hard real world problems

OBJECTIVES

- To give the students an overall knowledge of soft computing theories and fundamentals
- To give an understanding on the fundamentals of non-traditional technologies and approaches to solving hard real-world problems
- Fundamentals of artificial neural networks, fuzzy sets and fuzzy logic and genetic algorithms.
- Use of ANN, Fuzzy sets to solve hard real-world problems
- To given an overview of Genetic algorithms and machine learning techniques to solving hard real-world problems
- To study about the applications of these areas

OUTCOMES:

- Understand importance of soft computing.
- Understand different soft computing techniques like Genetic Algorithms, Fuzzy Logic , Neural Networks and their combination.
- Implement algorithms based on soft computing.
- Apply soft computing techniques to solve engineering or real life problems.

UNIT I FUZZY SET THEORY 9

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

UNIT II OPTIMIZATION 9

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

UNIT III NEURAL NETWORKS 9

Supervised Learning Neural Networks – Perceptrons - Adaline – Backpropagation Mutilayer Perceptrons – Radial Basis Function Networks – Unsupervised Learning Neural Networks – Competitive Learning Networks – Kohonen Self-Organizing Networks – Learning Vector Quantization – Hebbian Learning.

UNIT IV NEURO FUZZY MODELING 9

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

UNIT V APPLICATIONS OF COMPUTATIONAL INTELLIGENCE 9

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

TOTAL HOURS: 45

TEXT BOOKS

1.J.S.R.Jang, C.T.Sun and E.Mizutani, "Neuro-Fuzzy and Soft Computing", PHI, 2004, Pearson Education 2004.

REFERENCES

1.Timothy J.Ross, "Fuzzy Logic with Engineering Applications", McGraw-Hill, 1997.

2.Davis E.Goldberg, "Genetic Algorithms: Search, Optimization and Machine Learning", Addison Wesley, N.Y., 1989.

3.S. Rajasekaran and G.A.V.Pai, "Neural Networks, Fuzzy Logic and Genetic Algorithms", PHI, 2003.

4.R.Eberhart, P.Simpson and R.Dobbins, "Computational Intelligence - PC Tools", AP Professional, Boston, 1996.

SOFTWARE QUALITY MANAGEMENT

L	T	P	C
3	0	0	3

AIM

To understand the principles of software development emphasizing processes and activities of quality assurance.

OBJECTIVES

- Defining quality assurance plans
- Applying quality assurance tools & techniques

COURSE OUTCOMES

CO1: Learn the needs of software quality
CO2: Understand the factors affecting the SQA and requirement for SQA
CO3: Acquire knowledge of quality and the nature of software defects
CO4: Apply the quality tools and establish the steps for planning the quality
CO5: Understanding various quality standards

UNIT I INTRODUCTION TO SOFTWARE QUALITY 9

Software Quality – Hierarchical models of Boehm and McCall – Quality measurement – Metrics measurement and analysis – Gilb's approach – GQM Model.

UNIT II SOFTWARE QUALITY ASSURANCE 9

Quality tasks – SQA plan – Teams – Characteristics – Implementation – Documentation – Reviews and Audits.

UNIT III QUALITY CONTROL AND RELIABILITY 9

Tools for Quality – Ishikawa's basic tools – CASE tools – Defect prevention and removal – Reliability models – Rayleigh model – Reliability growth models for quality assessment.

UNIT IV QUALITY MANAGEMENT SYSTEM 9

Elements of QMS – Rayleigh model framework – Reliability Growth models for QMS – Complexity metrics and models – Customer satisfaction analysis.

UNIT V QUALITY STANDARDS 9

Need for standards – ISO 9000 Series – ISO 9000-3 for software development – CMM and CMMI – Six Sigma concepts.

TOTAL HOURS: 45

TEXT BOOK

1. Allan C. Gillies, “Software Quality: Theory and Management”, Thomson Learning, Third Edition, 2011.

2. Stephen H. Kan, “Metrics and Models in Software Quality Engineering”, Pearson Education (Singapore), 2002.

REFERENCES

1. Norman E. Fenton and Shari Lawrence Pfleeger, “Software Metrics” Thomson, 2003

2. Mordechai Ben – Menachem and Garry S.Marliss, “Software Quality”, Thomson Asia Pte Ltd, 2003.

3.Mary Beth Chrissis, Mike Konrad and Sandy Shrum, “CMMI”, Pearson Education (Singapore) Pte Ltd,2003.

4. ISO 9000-3 “Notes for the application of the ISO 9001 Standard to software development”.

SYSTEMS MODELING AND SIMULATION

L	T	P	C
3	0	0	3

AIM

To understand about systems modeling and simulation.

OBJECTIVES

- To learn about simulation terminologies.
- To learn about application areas of systems modeling.

OUTCOMES:

1. Define basic concepts in modeling and simulation (M&S)
2. Classify various simulation models and give practical examples for each category
3. Construct a model for a given set of data and motivate its validity
4. Generate and test random number variates and apply them to develop simulation models
5. Analyze output data produced by a model and test validity of the model
6. Explain parallel and distributed simulation methods

UNIT I INTRODUCTION TO SIMULATION **9**

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

UNIT II MATHEMATICAL MODELS **9**

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

UNIT III ANALYSIS OF SIMULATION DATA **9**

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

UNIT IV VERIFICATION AND VALIDATION **9**

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

UNIT V SIMULATION OF COMPUTER SYSTEMS AND CASE STUDIES 9

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

TOTAL HOURS: 45

TEXT BOOKS

1.Jerry Banks and John Carson, "Discrete Event System Simulation", Fourth Edition, PHI, 2005.

2.Geoffrey Gordon, "System Simulation", Second Edition, PHI, 2006 (Unit – V).

REFERENCES

1.Frank L. Severance, "System Modeling and Simulation", Wiley, 2001.

2.Averill M. Law and W.David Kelton, "Simulation Modeling and Analysis, Third Edition, McGraw Hill, 2006.

3.Jerry Banks, "Handbook of Simulation: Principles, Methodology, Advances, Applications and Practice", Wiley, 1998.

TCP/IP TECHNOLOGY

L	T	P	C
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AIM

This subject focuses on the concept of internetworking in general and TCP/IP Internet communication protocols in particular. It aims to cover both the architecture of network interconnections and principles underlying protocols

OBJECTIVES

- Ability to bind to many types of physical media, from wire to wireless LAN to WAN, and on the other end.
- To understand the Unicast and Multicast Environments.

COURSE OUTCOMES

- This subject focuses on the concept of internetworking in general and TCP/IP Internet communication protocols in particular. It aims to cover both the architecture of network interconnections and principles underlying protocols

UNIT I INTRODUCTION 9

Protocols and standards - OSI model - TCP/ IP protocol suite - addressing - versions - underlying technologies

UNIT II IP ADDRESSES, ROUTING, ARP AND RARP 9

Classful addressing - other issues - subnetting - supernetting - classless addressing - routing methods - delivery - table and modules - CIDR - ARP package - RARP.

UNIT III IP, ICMP, IGMP AND UDP 9

Datagram - fragmentation - options - checksum - IP package - ICMP - messages, formats - error reporting - query - checksum - ICMP package - IGMP - messages, operation - encapsulation - IGMP package - UDP - datagram - checksum - operation - uses - UDP package.

UNIT IV TCP UNICAST AND MULTICASTING PROTOCOLS 9

Services - flow, congestion and error control - TCP package and operation - state transition diagram - unicast routing protocols - RIP - OSPF - BGP - multicast routing - trees - protocols - MOSPF - CBT - PIM.

UNIT V APPLICATION LAYERS, SOCKETS 9

Client server model - concurrency - processes - sockets - byte ordering - socket system calls - TCP and UDP client-server programs - BOOTP -DHCP - DNS - name space, resolution - types of records - concept - mode of operation - Rlogin.

TOTAL HOURS: 45

TEXT BOOKS

1. Forouzan, " TCP/IP Protocol Suite" Second Edition, Tata MC Graw Hill, 2003.

2. Douglas E Comer," Internetworking with TCP/IP Principles, Protocols and Architecture",Vol 1 and 2, Vth Edition 2001

REFERENCES

1. W.Richard Stevens "TCP/IP Illustrated" Volume 2, Pearson Education 2003.

TOTAL QUALITY MANAGEMENT

L	T	P	C
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AIM

To provide comprehensive knowledge about the principles, practices, tools and techniques of Total quality management.

OBJECTIVES

- To understand the various principles, practices of TQM to achieve quality.
- To learn the various statistical approaches for Quality control.
- To understand the TQM tools for continuous process improvement.

OUTCOMES:

1. Develop an understanding on quality management philosophies and Frameworks
2. Develop in-depth knowledge on various tools and techniques of quality management
3. Learn the applications of quality tools and techniques in both manufacturing and service industry.

UNIT 1 INTRODUCTION 9

Definition of Quality, Dimensions of Quality, Quality Planning, Quality costs - Analysis Techniques for Quality Costs, Basic concepts of Total Quality Management, Historical Review, Principles of TQM, Leadership – Concepts, Role of Senior Management, Quality Council, Quality Statements, Strategic Planning, Deming Philosophy, Barriers to TQM Implementation.

UNIT 2 TQM PRINCIPLES 9

Customer satisfaction – Customer Perception of Quality, Customer Complaints, Service Quality, Customer Retention, Employee Involvement – Motivation, Empowerment, Teams, Recognition and Reward, Performance Appraisal, Benefits, Continuous Process Improvement – Juran Trilogy, PDSA Cycle, 5S, Kaizen, Supplier Partnership – Partnering, sourcing, Supplier Selection, Supplier Rating, Relationship Development, Performance Measures – Basic Concepts, Strategy, Performance Measure.

UNIT 3 STATISTICAL PROCESS CONTROL (SPC) 9

The seven tools of quality, Statistical Fundamentals – Measures of central Tendency and Dispersion, Population and Sample, Normal Curve, Control Charts for variables and attributes, Process capability, Concept of six sigma, New seven Management tools.

UNIT 4 TQM TOOLS 9

Benchmarking – Reasons to Benchmark, Benchmarking Process, Quality Function Deployment (QFD) – House of Quality, QFD Process, Benefits, Taguchi Quality Loss Function, Total Productive Maintenance (TPM) – Concept, Improvement Needs, FMEA – Stages of FMEA.

UNIT 5 QUALITY SYSTEMS 9

Need for ISO 9000 and Other Quality Systems, ISO 9000:2000 Quality System – Elements, Implementation of Quality System, Documentation, Quality Auditing, TS 16949, ISO 14000 – Concept, Requirements and Benefits.

TOTAL HOURS: 45

TEXT BOOKS

1.Dale H.Besterfiled, et al., Total Quality Management, Pearson Education, Inc. 2003. (Indian reprint 2004). ISBN 81-297-0260-6.

REFERENCES

1.James R.Evans & William M.Lidsay, The Management and Control of Quality, (5^{th} Edition), South-Western (Thomson Learning), 2002 (ISBN 0-324-06680-5).

2.Feigenbaum.A.V. "Total Quality Management, McGraw-Hill, 1991.

3.Oakland.J.S. "Total Quality Management Butterworth – Hcinemann Ltd., Oxford. 1989.

4.Narayana V. and Sreenivasan, N.S. Quality Management – Concepts and Tasks, New Age International 1996.

5.Zeiri. "Total Quality Management for Engineers Wood Head Publishers, 1991.

UNIX INTERNALS

L	T	P	C
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AIM

To learn about the UNIX operating System

OBJECTIVES

- To learn Kernel Basics in Unix
- To learn about the Unix File System
- To learn about various Unix system calls
- To learn about various Unix system processes
- To learn about Memory Management in Unix

COURSE OUTCOMES

- The student will get exposure to operating system and networking concepts.

UNIT I UNIX KERNEL BASICS **9**

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

UNIT II FILE SYSTEM **9**

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

UNIT III SYSTEM CALLS **9**

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

UNIT IV PROCESSES **9**

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

UNIT V MEMORY MANAGEMENT **9**

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

TOTAL HOURS: 45

TEXT BOOK

1.Maurice J. Bach, "The Design of the Unix Operating System", Pearson Education, 2002.

REFERENCES:

1. Uresh Vahalia, "UNIX Internals: The New Frontiers", Prentice Hall, 2000.

2. John Lion, "Lion's Commentary on UNIX", 6th edition, Peer-to-Peer Communications, 2004.

3. Daniel P. Bovet & Marco Cesati, “Understanding the Linux Kernel”, O’REILLY, Shroff Publishers &Distributors Pvt. Ltd, 2000.

4. M. Beck et al, “Linux Kernel Programming”, Pearson Education Asia, 2002.

USER INTERFACE DESIGN

L	T	P	C
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AIM

To understand that User Interface Design is as important as Functionality Design to study the basic principles User-Centered Design.

OBJECTIVES

- To study the basic characteristics of graphics and web interfaces
- To study the basics of Human Computer Interaction
- To study the basics of WIMP interfaces
- To study the multimedia interfaces for the web
- To study the principles of evaluating interfaces

OUTCOMES:

- Analysis, modeling, and problem solving
- Foundational knowledge and practice of computing
- Programming and system integration
- Interdisciplinary competency

UNIT I **8**

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

UNIT II **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 **9**

Windows: Characteristics-components-presentation styles-types-managements-organizations-operations-web systems-device-based controls: characteristics-Screen -based controls: operate control - text boxes-selection control-combination control-custom control-presentation control.

UNIT IV **9**

Text for web pages - effective feedback-guidance & assistance-Internationalization-accesssibility-Icons-Image-Multimedia -coloring.

UNIT V **9**

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

TOTAL HOURS: 45

TEXT BOOK

1.Wilbent. O. Galitz ,"The Essential Guide to User Interface Design", John Wiley& Sons, 2001.

REFERENCES

1.Ben Sheiderman, "Design the User Interface", Pearson Education, 1998.

2.Alan Cooper, "The Essential of User Interface Design", Wiley – Dream Tech Ltd., 2002.

VISUAL PROGRAMMING

L	T	P	C
3	0	0	3

AIM

To learn about visual programming constructs.

OBJECTIVES

- To learn about windows programming
- To learn about various controls

OUTCOMES:

CO1:Design Webpage using Visual Basic Controls with Data base Connectivity ODBC and DAO.

CO2: Identify the recourses for drawing, painting and sorting without using MFC

CO3: Analyze and Evaluate the concepts of windows programming using MFC (VC++)and Active X

CO4: Apply the general idea about the different Active X Controls and Dialog boxes.

CO5: Evaluate ODBC and DAO database connectivity‘s for webpage design using VC++

UNIT I **9**

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

UNIT II **9**

Controls – Modal and Modeless Dialog – Property – Data I/O – Sound – Timer

UNIT III **9**

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

UNIT IV **9**

ODBC – MFC Database classes – DAO - DLLs – Working with Images

UNIT V **9**

COM Fundamentals – ActiveX control – ATL – Internet Programming

TOTAL HOURS: 45

TEXT BOOKS

1.Richard C.Leinecker and Tom Archer, “Visual C++ 6 Programming Bible”,Wiley DreamTech Press, 2006.

REFERENCES

1. Lars Klander, “Core Visual C++ 6”, Pearson Education, 2000.

2.Deital, DEital, Liperi and Yaeger “Visual V++ .NET How to Program”, Pearson Education, 2004.

WIRELESS AND SENSOR NETWORKS

L	T	P	C
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AIM

To understand about wireless and sensor networks.

OBJECTIVES

- To learn about the basics of wireless sensor networks
- To learn about the architecture of wireless sensor networks

OUTCOMES:

- In-depth understanding of specialist bodies of knowledge within the engineering discipline.
- Application of established engineering methods to complex engineering problem solving.
- Fluent application of engineering techniques, tools and resources

UNIT I OVERVIEW OF WIRELESS SENSOR NETWORKS 9

Challenges for Wireless Sensor Networks, Enabling Technologies for Wireless Sensor Networks.

UNIT II ARCHITECTURES 9

Single-Node Architecture - Hardware Components, Energy Consumption of Sensor Nodes , Operating Systems and Execution Environments, Network Architecture - Sensor Network Scenarios, Optimization Goals and Figures of Merit, Gateway Concepts.

UNIT III NETWORKING SENSORS 9

Physical Layer and Transceiver Design Considerations, MAC Protocols for Wireless Sensor Networks, Low Duty Cycle Protocols And Wakeup Concepts - S-MAC , The Mediation Device Protocol, Wakeup Radio Concepts, Address and Name Management, Assignment of MAC Addresses, Routing Protocols- Energy-Efficient Routing, Geographic Routing.

UNIT IV INFRASTRUCTURE ESTABLISHMENT 9

Topology Control , Clustering, Time Synchronization, Localization and Positioning, Sensor Tasking and Control.

UNIT V SENSOR NETWORK PLATFORMS AND TOOLS 9

Sensor Node Hardware – Berkeley Motes, Programming Challenges, Node-level software platforms, Node-level Simulators, State-centric programming.

TOTAL HOURS: 45

TEXT BOOKS

1. Holger Karl & Andreas Willig, "Protocols And Architectures for Wireless Sensor Networks" , John Wiley, 2005.

2. Feng Zhao & Leonidas J. Guibas, “Wireless Sensor Networks- An Information Processing Approach", Elsevier, 2007.

REFERENCES

1. Kazem Sohraby, Daniel Minoli, & Taieb Znati, “Wireless Sensor Networks- Technology, Protocols, And Applications”, John Wiley, 2007.

2. Anna Hac, “Wireless Sensor Network Designs”, John Wiley, 2003.