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 – 4Years

CURRICULUM AND SYLLABUS
REGULATION 2012

CURRICULUM & SYLLABUS
REGULATION - 2012

(CHOICE BASED CREDIT SYSTEM)

[NBA – AICTE ACCREDITED]

VINAYAKA MISSION'S KIRUPANANDA VARIYAR ENGINEERING COLLEGE, SALEM

INTRODUCTION TO CHOICE BASED CREDIT SYSTEM

Choice based credit system (CBCS), or a cafeteria like system is the solution for transformation from the traditional teacher oriented education to a student-centered education. Taking responsibility for their own education in this way, students can benefit the most from all the available resources. Academic commissions and committees such as UGC, TANSCHE and NAAC recommended CBCS for higher education.

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THE OBJECTIVES OF CBCS:

- To enrich the horizon of knowledge of students by means of Core, Inter disciplinary, Extra disciplinary and Life/Job oriented courses.
- To ensure more interaction between the teacher and taught in class room and extra class room programmes.
- To offer flexibility in choosing the courses of study according to their needs and learning capacity.
- To enlighten the students on the rich culture of our nation and ethical values underlying real life situations.
- To allow the advanced learner to earn extra credits.
- To maintain the total credits of each programme on a par with International standards.
- To expose the students to the world of social commitment through specially designed components of study like NSS/NCC/Sports and Games.

The distinguished features of CBCS are the following:

- It permits students to learn at their own pace
- Choose electives from a wide range of elective courses offered by the departments
- Undergo additional courses and acquire more than the required number of credits
- Adopt inter-disciplinary approach in learning
- Make best use of the expertise of available faculty

CREDITS

Credit defines the quantum of contents/syllabus prescribed for a course and determines the number of hours of instruction required per week. Thus, normally in each of the courses, credits will be assigned on the basis of the number of lectures/tutorials/laboratory work and other forms of learning required to complete the course contents in a 15 week schedule.

For first year B.E programme (semester pattern) credits will be assigned on the basis of the number of lectures/tutorials/laboratory work and other forms of learning required to complete the course contents in a 15 week schedule.

Theory

- 1 Credit = 1 hour of lecture per week (1Credit course = 15 hours of lecture per schedule of 15 weeks)
- 2 Credit = 2 hours of lecture per week (2 Credit course = 30 hours of lecture per schedule of 15 weeks)
- 3 Credit = 3 hours of lecture per week (3 Credit course = 45 hours of lecture per schedule of 15 weeks)
- 4 Credit = 3 hours of lecture per week and 1 hour of tutorial per week (4 Credit course = 45 hours of lecture and 15 hours of tutorial per schedule of 15 weeks)

Practical

- 2 Credit = 3 hours of instruction per week (2 Credit course = 45 hours of laboratory work per schedule of 15 weeks)

FIRST YEAR B.E./B.TECH
CURRICULUM
REGULATION 2012
COMPUTER SCIENCE & ENGINEERING

SEMESTER I

Sl.No.	Name of the Course	Dept. Offering the course	Credits
	THEORY		
1.	English for Effective Communication	English	3
2.	Engineering Mathematics I	Maths	4
3.	Computer Foundation Program	Computer Science	3
4.	Environmental Science & Engineering	Chemistry	3
5.	Engineering Physics	Physics	3
6.	Basic Civil & Mechanical Engineering		3
	a) Civil Engineering	Civil	
	b) Mechanical Engineering	Mechanical	
	PRACTICALS		
7.	Engineering Physics Lab	Physics	2
8.	Workshop Practice Lab	Mechanical	2
9.	Computer Foundation Program Lab	Computer Science	2
TOTAL			25

SEMESTER II

Sl.No.	Name of the Course	Dept. Offering the course	Credits
	THEORY		
1.	Business English	English	3
2.	Engineering Mathematics - II	Maths	4
3.	Engineering Chemistry	Chemistry	3
4.	Programming in C	Computer Science	3
5.	Basic Electrical & Electronics Engineering		3
	a) Electrical Engineering	EEE	
	b) Electronics Engineering	ECE	
6.	Fundamentals of Algorithms	CSE	3
	PRACTICALS		
7.	Engineering Chemistry Lab	Chemistry	2
8.	Programming in C Lab	CSE	2
9.	Basic Electrical & Electronics Engineering Lab		2
	a) Electrical Engineering Lab	EEE	
	b) Electronics Engineering Lab	ECE	
TOTAL			25

CURRICULUM 3 TO 8 SEMESTERS

VINAYAKA MISSIONS UNIVERSITY

CURRICULUM 2012-2013
B.E. COMPUTER SCIENCE AND ENGINEERING

SEMESTER III

(Applicable to the students admitted from the Academic year 2012-2013 onwards)

Code No.	Course Title	L	T	P	C
THEORY					
1 (Allied core)	Advanced Engineering Mathematics (Common to CSE, IT)	3	1	0	4
2 (Allied core)	Digital Electronics (Common to CSE, IT)	3	0	0	3
3 (Main core)	Data Structures (Common to CSE, IT, EEE, EIE)	3	0	0	3
4 (Main core)	Object Oriented Programming (Common to CSE, IT, EEE & EIE)	3	0	0	3
5 (Main core)	Computer Architecture (Common to CSE, IT)	3	0	0	3
6 (Main core)	System Software	3	0	0	3
PRACTICAL					
1	Digital Electronics lab (Common to CSE, IT,ECE, MECT, EEE, E&I)	0	0	4	2
2	Data Structures Lab (Common to CSE, IT, EIE, EEE, MECT, BME)	0	0	4	2
3	Object Oriented Programming Lab (Common to CSE, IT, ECE)	0	0	4	2

SEMESTER IV

(Applicable to the students admitted from the Academic year 2012-2013 onwards)

Code No.	Course Title	L	T	P	C
THEORY					
1 (Allied core)	Probability and Queuing Theory (Common to CSE, IT)	3	1	0	4
2 (Main core)	Software Engineering & Quality Assurance (Common to CSE, IT)	3	0	0	3
3 (Main core)	Operating Systems (Common to CSE, IT)	3	0	0	3
4 (Main core)	Database Management Systems (Common to CSE, IT)	3	0	0	3
5 (Main core)	Graphics Design and Multimedia Animation (Common to CSE, IT)	3	0	0	3
6 (Main core)	Computer Networks (Common to CSE, IT)	3	0	0	3
PRACTICAL					
1	Operating Systems Lab (Common to CSE, IT)	0	0	4	2
2	DBMS Lab (Common to CSE, IT)	0	0	4	2
3	Graphics and Multimedia Lab (Common to CSE, IT)	0	0	4	2
4	Professional Communication & Personality Development Lab	0	0	4	2

SEMESTER V

(Applicable to the students admitted from the Academic year 2012-2013 onwards)

Code No.	Course Title	L	T	P	C
THEORY					
1 (Allied core)	Discrete Mathematics (Common to CSE, IT)	3	1	0	4
2 (Main core)	Programming and Interfacing with processors (Common to CSE, IT)	3	0	0	3
3 (Main core)	Java Programming (Common to CSE, IT)	3	0	0	3
4 (Main core)	Object Oriented Analysis and Design (Common to CSE, IT)	3	0	0	3
5 (Main core)	Data warehousing and Mining	3	0	0	3
6 (Main core)	Elective - I	3	0	0	3
PRACTICAL					
1	Assembly Language Programming Lab (Common to CSE, IT)	0	0	4	2
2	Java Programming Lab (Common to CSE, IT)	0	0	4	2
3	Case Tools lab (Common to CSE, IT)	0	0	4	2

SEMESTER VI

(Applicable to the students admitted from the Academic year 2012-2013 onwards)

Code No.	Course Title	L	T	P	C
THEORY					
1 (Main core)	Cryptography & Network Security (Common to CSE, IT)	3	0	0	3
2 (Main core)	Web Technology (Common to CSE, IT)	3	0	0	3
3 (Main core)	Advanced Java Programming (Common to CSE, IT)	3	0	0	3
4 (Main core)	Principles of Compiler Design	3	0	0	3
5(Main core)	Artificial Intelligence	3	0	0	3
6 (Main core)	Elective – II Mobile Application Development	3	0	0	3
PRACTICAL					
1	Advanced Java Programming Lab (Common to CSE, IT)	0	0	4	2
2	Web Technology Lab (Common to CSE, IT)	0	0	4	2
3	Compiler Design Lab	0	0	4	2

SEMESTER VII

(Applicable to the students admitted from the Academic year 2012-2013 onwards)

Code No.	Course Title	L	T	P	C
THEORY					
1 (Industry core)	Business intelligence & Its Applications	3	0	0	3
2(Allied core)	Engineering Management and Ethics	3	0	0	3
3 (Main core)	Information Security	3	0	0	3
4(Main core)	Software Testing	3	0	0	3
5(Main core)	C # & .Net Frame work	3	0	0	3
6 (Elective)	Elective – III – High Speed Networks	3	0	0	3
PRACTICAL					
1	Software Testing Lab	0	0	4	2
2	C # & .Net Frame work Lab	0	0	4	2
3	Mini Project	0	0	6	3

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

Sl. No.	Course Title	L	T	P	C
1.	Cyber Security (Common to CSE & IT)	3	0	0	3
2.	Open Source Systems(Common to CSE & IT)	3	0	0	3
3.	Building Enterprise Application	3	0	0	3
4.	Resource Management Techniques	3	0	0	3
5.	UNIX Internals	3	0	0	3
6.	Grid Computing (Common to CSE & IT)	3	0	0	3
7.	Advanced Database Technology	3	0	0	3
8.	Theory of Computation	3	0	0	3
9.	Distributed System	3	0	0	3
10.	Real Time Systems	3	0	0	3
11.	TCP / IP Technology	3	0	0	3
12.	Soft Computing	3	0	0	3
13.	Systems Modeling & Simulation	3	0	0	3
14.	Design and Analysis of Algorithms	3	0	0	3
15.	User Interface Design	3	0	0	3
16.	Total Quality Management	3	0	0	3
17.	Parallel Computing	3	0	0	3
18.	High Speed Networks	3	0	0	3
19.	Digital Image Processing	3	0	0	3
20.	Robotics	3	0	0	3
21.	Software Quality Management	3	0	0	3
22.	Quantum Computing	3	0	0	3
23.	Knowledge Based Decision Support Systems	3	0	0	3
24.	Cloud Computing	3	0	0	3
25.	Visual Programming	3	0	0	3

FIRST YEAR B.E. / B.TECH

SEMESTER I

ENGLISH FOR EFFECTIVE COMMUNICATION **Credit: 3**

(Common to all Branches)

AIM

Provide the knowledge to students of engineering courses, to learn English for Effective Communication

OBJECTIVE

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

Word formation with prefixes and suffixes – Antonyms & Synonyms – Tense Forms – Active and Passive voices – Different kinds of Nouns & Pronouns – Use of Verbs & Adverbs – Adjectives – Degrees of Comparison – Conditional Sentences – Common Errors in English – Reported Speech – Articles.

UNIT-II

Phonetics (Vowels, Consonants and Diphthongs) – Pronunciation Guidelines – Vocabulary (Homophones).

UNIT-III

Principles of communication --– Defining & Describing objects – Role Play – Debate – Telephonic Etiquettes.

UNIT-IV

How to write reports, report writing – Recommendations – Discussing data and coming to conclusions – Technical Reports – Project Proposals – Brochures – News Letters – Memorandum (or) Memo.

UNIT-V

Flow charts – Pie-charts – Bar charts – Interpreting Tables – Formal and Informal letters – Resume Writing.

Total: 45 hours

TEXT BOOK

English for Effective Communication, Departments of English, VMKV & AVIT. Erode: SCM Publishers, 2009.

REFERENCE BOOKS

1. M.Ashraf Rizvi, **Effective Technical Communication.** New Delhi: Tata McGraw Hill Publications, 2007.
2. Pickett and Laster. **Technical English: Writing, Reading and Speaking.** New York: Harper and Row Publications, 2002.
3. Cutts, Martin. **The Plain English Guide – How to Write Clearly and Communicate Better.** New Delhi: Oxford University Press, 1995.
4. Narayanaswami.V.R. **Strengthen Your Writing.** Chennai: Orient Longman Ltd., 1996.
5. Prof.K.R.Lakshmi Narayanan & Dr.T.Murugavel, **Communication Skills for Engineers,** Chennai: SCI Publications, 2002.

ENGINEERING MATHEMATICS-I

(COMMON TO THE BRANCHES MECH,ECE,CSE, CSSE,EEE,EIE,CIVIL,IT,MECHTRONICS,AERONAUCTICAL ,ETC,AUTOMOBILE)

The syllabus for Engineering Mathematics- I common to all branches except Bio info and Bio tech approved by the Board of studies held on 28th and 29th July 2012 at VMKV Engineering College, Salem

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 I MATRICES 09

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 II DIFFERENTIAL CALCULUS 09

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

UNIT III FUNCTIONS OF SEVERAL VARIABLES 09

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

UNIT IV LAPLACE TRANSFORMS 09

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 V APPLICATIONS OF LAPLACE TRANSFORMS 09

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.

Total hours : 60
Lecture Hours: 45
Tutorial Hours: 15
Credit : 04

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.

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 (4th edition), S.Chand & Co., New Delhi., 2001.

COMPUTER FOUNDATION PROGRAM **Credit : 3**

(Common to all Branches)

AIM

To understand the Basics of Computer and Information Technology skills and Problem Solving Techniques

OBJECTIVE

The proposed course exposes the students to IT Essentials. The Core Modules of this paper includes Programming, Database and Operating system and other related topics.

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 **9**

Digital computer fundamentals-Block diagram of a computer-component of a computer system Hardware and software definitions-Categories of software-Booting-Installing and Uninstalling Software-Software piracy-Software terminologies-Application of Computer-Role of Information Technology-History of Internet-Internet Services.

UNIT II - Problem Solving Methodologies and Techniques **9**

Problems solving Techniques-Program development cycle-Algorithm-Design-Flow chart-Program control structures-Types and generation of programming languages-Development of algorithms for simple problems. Top down and Bottom up approaches of software development.

UNIT III - Basics of Computer Architecture and System Software **9**

Fundamentals of Computer Architecture-Introduction-Organization of a small computer Central Processing Unit-Execution cycle-Instruction categories – measure of CPU performance Memory-Input/output devices-BUS-addressing modes.

System Software-Assemblers-Loaders and linkers-Compilers and interpreters.

UNIT IV - Basics of Operating System and DBMS **9**

Introduction-Basics of memory management schemes-Scheduling-threads.

Introduction to File and Database systems- SQL-DDL statements-DML statements-DCL statements.

UNIT V - Software Applications **9**

Office Automation: Application Packages-word processing-Spread sheet Application and Basics of HTML.

Total: 45 hours

TEXT BOOK

1. Faculties, School of Computer Science, "Computer Foundation Program", Anuradha Publication, 2012.

REFERENCES

1. Ashok N.Kamthane, programming with ANSI and TURBO C, Pearson Education (India) 2005.
2. V.Ramesh babu, fundamental of computing, VRB publisher, 2004.
3. Carl Hamacher, Zvonko Varnesie and Safwat Zaky, 5th Edition "Computer Organization", McGraw-Hill, 2002.
4. Leland L.Beck, "System Software- An Introduction to Systems Programming", 3rd Edition, Pearson Education Asia, 2000.
5. Abraham Silberschatz, Peter Baer Galvin and Greg Gange, "Operating System Concepts", Sixth Edition, John Wiley & Sons Pvt. Ltd,2003.
6. Abraham Silberschatz, Henry F.Korth and S.Sudarshan – "Database Systems Concepts", Fourth Edition, McGraw-Hill, 2002.

ENVIRONMENTAL SCIENCE AND ENGINEERING **Credit : 3**

(Common to all Branches)

AIM:

To understand the scope and importance of Environment and its potential impact on all areas.

OBJECTIVE

Understanding and appreciation of cultural aspects of society
Understanding of professional and ethical responsibility of engineering practice
Knowledge of contemporary issues

OUTCOME

The student will come out with ethical responsibility in his/her profession.

UNIT – I - ENVIRONMENT AND NATURAL RESOURCES **9**

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**

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**

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 land slides – Clean technology options.

UNIT – IV - SOCIAL ISSUES AND ENVIRONMENT **9**

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**

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. 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
2. Miller T.G. Jr Environmental Science Wadsworth Publishing Co.
3. Townsend C. Harper J. and Michael Begon, Essentials of Ecology, Blackwell Science.

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.

DEPARTMENT OF PHYSICS

ENGINEERING PHYSICS

(Common to all branches of B.E)

Aim

To familiarize students with the basic concepts of Physics and their application in Engineering & Technology

Objective

To understand the principles, applications of LASERs and Fibre Optics
To understand about the Crystal structures
To understand the concepts of acoustics
To learn about various Non-Destructive techniques

Outcome

Students will gain knowledge in the basic concepts of physics which can be applied in Engineering & Technology

UNIT – I Lasers

Einstein coefficients (A&B), Nd – YAG laser, CO_2 laser, semiconductor laser (homojunction) – uses of lasers – Holography – construction and reconstruction of a hologram.

UNIT – II Fibre Optics

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 (block diagram only) – fibre optic sensors (displacement sensor and pressure sensor).

UNIT – III Crystal Physics

Lattice – unit cell – Bravais lattice – Lattice planes – Miller indices – ‘d’ spacing in cubic lattice – calculation of number of atoms per unit cell – atomic radius – coordination number – packing factor for SC, BCC, FCC, HCP structures.

UNIT – IV Acoustics

Classification of sound – characteristics of musical sound – loudness – Weber-Fechner law – decibel – absorption coefficient – experimental determination – reverberation – reverberation time – Sabine’s formula (no derivation) – factors affecting acoustics of buildings (reverberation time, loudness, focusing, echo, echolen effect, resonance and noise) and their remedies.

UNIT- V Non – Destructive Testing

Liquid penetrant method – ultrasonic flaw detection – ultrasonic flaw detector (block diagram) – X-ray Radiography: displacement method – X-ray Fluoroscopy – merits and demerits of each method.

TEXT BOOK

1. Gaur R. K. and Gupta S. L., "Engineering Physics", Dhanpat Rai publishers, New Delhi, 2001.
2. Rajendran. V, "Engineering Physics", Tata Mc Graw Hill Publication and Co New Delhi, 2009.

REFERENCE BOOKS

1. Pillai S.O "Solid Sate Physics", New Age International Publication, New Delhi, (2003).
2. Palanisamy P.K. "Physics for Engineers", Scitech publications (India) Pvt. Ltd., Chennai (2005).
3. Rajendran V and Marikani "Physics for Engineers", Tata McGraw Hill Publising Company Ltd, New Delhi (2004).
4. Arumugam M, "Engineering Physics", Anuradha Agencies, Kumbakonam, Second Edition (2005).

BASIC CIVIL & MECHANICAL ENGINEERING **Credit: 3**

(Common to ECE, EIE, EEE, ETC, CSE, IT, CSSE, MECT& BME)

AIM

To make the students 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

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 **8**

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

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

UNIT-II: BUILDING COMPONENTS AND STRUCTURES **8**

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

Superstructure: Brick masonry – stone masonry – beams – columns – lintels – roofing – flooring – plastering –Types of Bridges and Dams – Basics of Interior Design and Landscaping.

UNIT-III: BASICS OF ENGINEERING MECHANICS **7**

Mechanics – Internal and external forces – stress – strain – elasticity – Centroid – Centre of Gravity – Simple problems - Moment of Inertia – Simple Problems.

b) MECHANICAL ENGINEERING

UNIT-IV: POWER PLANT ENGINEERING **8**

] Introduction, Classification of Power Plants – Working principle of steam, Gas, Diesel, Hydroelectric and Nuclear Power plants – Merits and Demerits – Pumps and turbines – working principle of Reciprocating pumps (single acting and double acting) – Centrifugal Pump.

UNIT-V: I C ENGINES **8**

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

UNIT-VI : REFRIGERATION AND AIR CONDITIONING SYSTEM **7**

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

TOTAL: 46 PERIODS

TEXT BOOK

1. Venugopal. K, Kanchana, Prabhu Raja. V, " Basic Civil and Mechanical Engineering", Anuradha Publications, Kumbakonam (2011)

REFERENCES

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

PRACTICALS

ENGINEERING PHYSICS LAB **Credit : 2**

(Common to all Branches)

AIM

To gain the knowledge of taking precise readings from equipments

OBJECTIVE

To make the students enabled in taking measurements and to develop their skills in measuring basic and derived units.

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

WORKSHOP PRACTICE **Credit : 2**

(Common to MECH, ECE, CSE, CSSE, EEE, EIE, CIVIL, IT, MECHTRONICS, AERONAUCTICAL, ETC & AUTOMOBILE)

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. Vee Joint
2. Square Joint
3. Dove Tail Joint

CARPENTRY

1. Planning
2. Half lab
3. Dove Tail Joint

WELDING

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

DEMONSTRATION

1. Sheet Metal – Fabrication of tray and cone
2. Black Smithy – Round to square rod.
3. Foundry – Mould Preparation using single piece and split pattern

REFERENCE

1. “Basic Workshop Practice “, Department of Mechanical Engineering, VMKV Engineering College, 2008

COMPUTER FOUNDATION PROGRAM LAB **Credit : 2**

(Common to 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

I. OFFICE AUTOMATION

1. Create a document with all formatting effects.
2. Create a document to send mails using mail merge option.
3. Create an Excel File to analyze the student's performance. Create a chart for the above data to depict it diagrammatically.
4. Create Excel sheet to maintain employee information and use this data to send mails using mail merge.
5. Create a Power Point presentation for your personal profile with varying animation effects with timer.

II. SQL QUERIES

6. Write SQL Commands for Data Definition, Table Creation with constraints.
7. Write SQL Commands for Insert, Select, Update and Delete operations.
8. Write SQL Commands for aggregate functions.

III. HTML

9. Write HTML code to develop a web page having the background in red and title "My First Page" in any other color.
10. Design a page having background color given text color red and using all the attributes of font tab.
11. Create a web page, when user clicks on the link it should go to the bottom of the page.
12. Create a web page, showing an ordered & unordered list of name of your five friends.
13. Create a web page with appropriate content and insert an image towards the left hand side of the page when user clicks on the image. It should open another web page.
14. Create a web page which should contain a table having two rows and two columns.

SEMESTER II

BUSINESS ENGLISH **Credit : 3**

(Common to all Branches)

AIM

Provide the knowledge to students of engineering courses, to learn English for day to day life

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) – Impersonal Passive Voice- Preposition – Cause and Effect – Phrasal Verbs – Idioms and Phrases – Question tags – Vocabulary - Sentence pattern (SVOCA) – Auxiliary and Modal verbs – Simple, Complex and Compound Sentences.

UNIT – II

Stress (Word Stress and Sentence Stress) – Intonation – Differences between British and American English – Indianism.

UNIT – III

Understanding Ideas and Making Inferences – Interview Questions (Direct, Open-ended and Closed Questions) – E- mail Netiquette, Sample E-mails- Group Discussion and Mock interview.

UNIT – IV

Instruction – check List – Minutes of the Meeting and Writing Agenda – Note making- Rearranging the jumbled sentences – Technical Articles – Project Proposals.

UNIT – V

Skimming – Scanning – Reading Comprehension – Business Letters (Calling for Quotation, Placing orders and Complaint Letters) – Essay Writing and Developing Hints – Expansion of an Idea

Total: 45 hours

TEXT BOOK

1. **English for Effective Communication,** Departments of English, VMKV & AVIT. Erode: SCM Publishers, 2009.

REFERENCE BOOKS

1. M.Ashraf Rizvi, **Effective Technical Communication.** New Delhi: Tata McGraw Hill Publications, 2007.
2. Pickett and Laster. **Technical English: Writing, Reading and Speaking.** New York: Harper and Row Publications, 2002.
3. Cutts, Martin. **The Plain English Guide – How to Write Clearly and Communicate Better.** New Delhi: Oxford University Press, 1995.
4. Narayanaswami.V.R. **Strengthen Your Writing.** Chennai: Orient Longman Ltd., 1996.
5. Prof.K.R.Lakshmi Narayanan & Dr.T.Murugavel, **Communication Skills for Engineers,** Chennai: SCI Publications, 2002.

DEPARTMENT OF MATHEMATICS

Second Semester

BATCH: 2012- 2013 (ONWARDS)

ENGINEERING MATHEMATICS-II

(COMMON TO THE BRANCHES MECH,ECE,CSE, CSSE,EEE,EIE,CIVIL,IT,MECHTRONICS,AERONAUCTICAL ,ETC,AUTOMOBILE)

The syllabus for Engineering Mathematics- II common to all branches except Bio info and Bio tech approved by Board of studies held on 28th and 29th July 2012 at VMKV Engineering College, Salem

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 ORDINARY DIFFERENTIAL EQUATIONS 09

Solutions of third and higher order linear ordinary differential equation with constant coefficients – Method of variation of parameters – Cauchy's and Legendre's linear equations – Simultaneous first order linear equations with constant coefficients.

UNIT II MULTIPLE INTEGRALS 09

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

UNIT III VECTOR CALCULUS 09

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).

UNIT IV ANALYTIC FUNCTIONS **09**

Function of a complex variable – Analytic function – Necessary conditions - Cauchy Riemann equations – Sufficient conditions (excluding proof) – Harmonic conjugate–Constructions of analytic functions-conformal mapping($w=z+c, w=z^2, w=1/z$)-bilinear transformation

UNIT V COMPLEX ANALYSIS **09**

Statement and application of Cauchy's integral theorem and integral formula – Taylor's and Laurent's expansions –Residues – Cauchy's residue theorem-contour integration over unit circle.

Total hours: 60
Lecture Hours: 45
Tutorial Hours: 15
Credit:04

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.

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 (4th edition), S.Chand & Co., New Delhi., 2001

ENGINEERING CHEMISTRY **Credit : 3**

(Common to all Branches)

Aim:

The course is aimed to make the student knowledgeable about the basic concepts of chemistry in engineering solutions.

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 : WATER TECHNOLOGY & CORROSION **9**

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 (Sacrificial and Impressed current method).

UNIT II : ELECTROCHEMISTRY, BATTERIES AND FUEL CELLS **9**

Ostwald Law and Debye Huckle's law - Cells – Electrode (SHE, Calomel and Glass) - Electrode potential – Nernst equation – EMF series.

Primary cells – secondary batteries – charging and discharging.

UNIT III : CHEMISTRY OF ADVANCED MATERIALS **9**

Portland cement –setting and hardening – RCC – Special cements.

Organic electronic material, solid oxide materials, shape memory alloys, nanomaterials, polymers, fullerenes, ceramics, fibers, lubricants, refractories & composites (definition, classification and applications)

UNIT IV : PHASE EQUILIBRIA & NUCLEAR CHEMISTRY **9**

Phase rule: statement and explanation of terms involved – One component system – Condensed phase rule – Two component system.

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

UNIT V : CHROMATOGRAPHY AND SPECTROSCOPY **9**

Chromatography — classification & principles (Paper, column, thin layer, gas, HPLC).

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

Total: 45 hours

REFERENCES:

1. Engineering Chemistry by S.S. Dara.
2. Engineering Chemistry by Jain & Jain.

PROGRAMMING IN C **Credit : 3**

(Common to all Branches)

AIM

To know the concepts of C programming structures and techniques.

OBJECTIVE

To enable the student to develop the knowledge in C programming language.

OUTCOME

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

UNIT I **9**

Introduction: Algorithms & flowcharts-Overview of C-Features of C-IDE of C Structure of C program-Compilation & execution of C program-Identifiers, variables, expression, keywords, data types, constants, scope and life of variables, local and global variables. Operators: arithmetic, logical, relational, conditional and bitwise operators- Special operators: size of () & comma (,) operator-Precedence and associativity of operators & Type conversion in expressions.

Basic input/output and library functions: Single character input/output i.e. getch(), getchar(), getche() & putchar()-Formatted input/output: printf() and scanf()-Library Functions: concepts, mathematical and character functions.

UNIT II **9**

Control structures: Conditional control-Loop control and Unconditional control structures.

Functions: The Need of a function-User defined and library function- Prototype of a function-Calling of a function-Function argument-Passing arguments to function- Return values-Nesting of function- main()-Command line arguments and recursion. Storage class specifier – auto, extern, static, & register.

UNIT III **9**

Arrays: Single and multidimensional arrays-Array declaration and initialization of arrays-Array as function arguments.

Strings: Declaration-Initialization and string handling functions.

Structure and Union: Defining structure-Declaration of structure variable-Accessing structure members-Nested structures-Array of structures-Structure assignment-Structure as function argument-Function that returns structure- Union.

UNIT IV **9**

Pointers: The '&' and * operators-Pointers expressions-Pointers vs arrays-Pointer to functions-Function returning pointers-Static and dynamic memory allocation in C.

DMA functions: malloc(), calloc(), sizeof(), free() and realloc()-Preprocessor directives.

UNIT V **9**

File management: Defining, opening & closing a file, text file and binary file- Functions for file handling: 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: 45 hours

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. Stevens , 'Graphics programming in C', BPB publication, 2006
5. Subbura.R , 'Programming in C', Vikas publishing, 1st Edition, 2000

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING **Credit : 4**

(Common to ECE,ETCE,MECHT,BME,BT,BF,EEE,EIE,CSE,IT,CSSE AND CIVIL)

a) ELECTRICAL ENGINEERING

AIM

This course aims in providing the fundamental knowledge of Electrical quantities. It gives an insight as to how an Electrical circuit behaves

OBJECTIVE

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

OUTCOME

A student after acquiring knowledge of these ideas, becomes empowered to handle the Electrical machines and instruments with confidence.

b) ELECTRONICS ENGINEERING

AIM

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

OBJECTIVE

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.

a) ELECTRICAL ENGINEERING

UNIT I **8**

Electrical Circuits & Meters

Definition of electromotive force, current, power and energy-International System of units-Ohm's law and Kirchhoff's laws-solution of series and parallel Circuits.

Generation of alternating voltage-average and RMS values-solution of simple R,RL,RC and RLC circuits- Calculation of power and power factor in AC circuits.

Construction and principles of operation of moving coil, moving iron and dynamometer instruments.

UNIT II **8**

DC Machines (Qualitative Treatment Only)

DC machines – parts-DC generator-EMF equation-Different types of DC generators and their applications-DC motors and their applications-different types -speed control-Starters.

UNIT III **7**

AC Machines (Qualitative Treatment Only)

Construction & principle of operation of transformers-Single phase & Three phase transformers-Construction and operation of AC motors-Single phase and three phase Induction motors-applications-construction, principles of operation and application of synchronous motors.

b) ELECTRONICS ENGINEERING

UNIT I: SEMICONDUCTOR DEVICES AND APPLICATIONS 8

Passive and Active Components – Resistors, Inductors, Capacitors, Characteristics of PN Junction Diode – Zener Effect – Zener Diode and its Characteristics – Half wave and Full wave Rectifiers – Voltage Regulation.

Bipolar Junction Transistor – CB, CE, CC Configuration and Characteristics.

UNIT II: FUNDAMENTALS OF COMMUNICATION ENGINEERING 8

Types of Signals: Analog and Digital Signals – Modulation and Demodulation: Principles of Amplitude Modulation, Angle Modulation, Pulse Amplitude Modulation, Pulse Width Modulation and Pulse Code Modulation

Communication Systems: Radio, High DefinitionTV, MODEM, Fax, Microwave, Radar, Satellite and Optical Fibre, Mobile-Cellphones (block diagram description only).

UNIT III: STUDY OF ADVANCED ELECTRONIC GADGETS 7

High Definition Camera, High Definition Video Camera, Tablet PC, Android Phones, i pods, Video Game Consoles

Total: 46 hours

TEXT BOOKS

1. "Basic Electrical and Electronics Engineering", compiled by Department of EEE&ECE Faculty of Engineering & Technology, VMRFDU, Anuradha Agencies, 2006.
2. "Basic Electronics Engineering", Compiled by Department of ECE, Faculty of Engineering and Technology, VMRFDU, Anuradha agencies,2012.
3. Edward Hughes, "Electrical and Electronics Technology", Pearson Education Limited, Ninth edition, 2005.

REFERENCES

1. B.R. Guptha, "Principles of Electrical Engineering " ,S.Chand & Co,2002.
2. I.J.Nagrath, "Elements of Electrical Engineering", Tata McGraw Hill Publishing Co., 2002.
3. H.Cotton." Advanced Electrical Technology", Wheeler, 1983.
4. Anokh Singh, Principles of Communication Engineering, S.Chand & Co, 1994.
5. John Kennedy "Electronics Communication System" Tata McGraw Hill.
6. Millman and Halkias, "Electronic Devices and Circuits", Tata McGraw hill.
7. V.K.Mehta,"Principles of Electronics"S.Chand&Co,2002
8. http://en.wikipedia.org/wiki/cell-phone
9. http://en.wikipedia.org/wiki/high-definition-video
10. http://en.wikipedia.org/wiki/tablet-components
11. http://en.wikipedia.org/wiki/cell-phone
12. http://en.wikipedia.org/wiki/android-operating -system
13. http://www.apple.com/pad/
14. http://en.wikipedia.org/wiki/ipad
15. http://en.wikipedia.org/wiki/video-game-console

FUNDAMENTALS OF ALGORITHM

AIM

To study the algorithm concepts in computer programming and computing methods.

OBJECTIVE

To study a broad variety of important and useful algorithms—methods for solving problems that are suited for computer implementation

OUTCOME

Do enable the student to learn the major components of a computer system, the correct and efficient ways of solving problems and to learn the use office automation tools.

UNIT I INTRODUCTION TO COMPUTER PROBLEM SOLVING

Introduction - The Problem-Solving aspect, top-down design-Implementation of Algorithms-program verification-The efficiency of algorithms-The analysis of algorithms-Fundamental Algorithms: Introduction-Exchanging the values of two variables-Counting-Summation of a set of Numbers-factorial computation-Sine function computation-Generation of the Fibonacci sequence-Reversing the digits of an integer, base conversion-Character to Number conversion.

UNIT II FACTORING METHOD

Introduction - Finding the square root of a number-The smallest divisor of an integer-The greatest common divisor of two integers-Generating Prime Numbers-Computing the Prime Factors of an integer-Generation of Pseudo-random Numbers-Raising a Number to a Large Power-Computing the nth Fibonacci Number.

UNIT III ARRAY TECHNIQUES

Introduction - Array Order Reversal-Array Counting or Histogramming-Finding the maximum Number in a Set-Removal of Duplicates from an Ordered Array-Partitioning an Array-Finding the kth smallest Eleent-Longest Monotone Subsequence.

UNIT IV MERGING SORTING AND SEARCHING

Introduction - The Two-way Merge-Sorting by Selection-Sorting by Exchange-Sorting by Insertion-Sorting by Diminishing Increment-Sorting by Partitioning-Binary Search-Hash Searching.

UNIT V TEXT PROCESSING AND PATTERN SEARCHING

Introduction -Text Line Length Adjustment-Left and Right Justification of Text-Keyword Searching in Text-Text Line Editing-Linear Pattern search- Sublinear Pattern Search.

Total: 45 hours

TEXT BOOKS:

1. Dromey.R.G, “How to Solve it by Computer”, Prentice-Hall of India, 1996.

REFERENCE BOOKS

1. Aho.A.V., Hopcroft.J.E and Ullman.J.D, “The Design and Analysis of Computer Algorithms”, Pearson education, 2004
2. Knuth,D.E., “The Art of computer programming Vol 1:Fundamental Algorithms”, 3rd Edition, Addison Wesley, 1997
3. Knuth,D.E., “Mathematical Analysis of algorithms”, Proceedings IFIP congress, 1971.

PRACTICALS

ENGINEERING CHEMISTRY LAB **Credit : 2**

(Common to all Branches)

AIM

To verify the theoretical concepts practically in a more explicit and concentrated manner

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. Determination of alkalinity by indicator method.
3. Estimation of ferrous ion by Potentiometry.
4. Titration of strong acid with strong base 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.

PROGRAMMING IN C LAB **Credit : 2**

(Common to CSE, IT, CSSE, M.Sc(SE), MECH, AUTOMOBILE, AERONAUTICAL, CIVIL, BIO-TECHNOLOGY& BIOINFORMATICS)

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. Implementation of Sine and cosine series.
2. Generation of Fibonacci series.
3. To find the i) Factorial number.
   ii) Sum of n natural numbers.
4. Reversing the digits of an integer
5. Conversion of decimal number to octal number
6. Conversion of character integer to decimal number
7. Finding the square root of a given number by applying algorithm
8. (a) Find GCD of two numbers
   (b) Generate Prime numbers between 1 and n.
9. Greatest of three numbers using if statement and conditional operator.
10. Read two numbers and swap those two numbers using temporary variable and without using temporary variable.
11. Quadratic equation for different sets of inputs.
12. Use of switch….Case statements.
13. Matrix operations
    a) Addition
    b) Transpose
    c) Multiplication
14. Ascending and Descending order.
15. Given a set of n numbers, find the length of the longest monotone increasing subsequence.
16. Sort by exchange, selection and partitioning method
17. Use of pointers and array of pointers
18. Linear search.
19. Binary search.
20. Files operations.

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING Credit: 2

(Common to ECE,ETCE,MECHT,BME,BT,BF,EEE,EIE,CSE,IT,CSSE AND CIVIL)

a) ELECTRICAL ENGINEERING

AIM

This course aims in providing the fundamental knowledge of Electrical quantities. It gives an insight as to how an Electrical circuit behaves

OBJECTIVE

To know about Electrical Apparatus Wiring and Measuring Methods.

OUTCOME

A student after acquiring knowledge of the basic ideas, becomes empowered to handle the Electrical Apparatus with confidence.

b) ELECTRONICS ENGINEERING

AIM

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

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.

a) BASIC ELECTRICAL ENGINEERING LAB

LIST OF EXPERIMENTS

1. Residential house wiring using switches, fuse, indicator, lamp and energy meter.
2. Fluorescent lamp wiring.
3. Stair case wiring
4. Measurement of electrical quantities – voltage, current, power & power factor in RLC circuit.
5. Measurement of energy using single phase energy meter.
6. Measurement of resistance to earth of electrical equipment.

b) BASIC ELECTRONICS ENGINEERING LAB

1. Familiarization with Electronic Components like R, L, C and active devices.
2. Familiarization with Bread board, CRO, Power supply (RPS, FPS) and Soldering Practice.
3. Generation of lissajous patterns using CRO.
4. Measurement of amplitude and time period using CRO.
5. Study of the Characteristic of PN-Junction diode with its applications.
6. Study of the Characteristic of Zener diode with its applications
7. Study of the rectifier circuits (Half wave and Full Wave) with its applications.
8. Study of BJT Characteristics with its applications.
9. Study of AM/FM Receiver.
10. Study of advanced electronic gadgets.

SEMESTER-III
DIGITAL ELECTRONICS
(Common for ECE/ MECHAT/CSE/IT/ EEE/EIE)

L	P	T	C
3	0	0	3

AIM

The Aim of this course is to develop a strong foundation in analysis and design of digital electronics.

OBJECTIVES:

1. Understand the basic concepts.
2. Understand concepts of logic gates constructional features.
3. To understand the concepts of gate-level minimization & combinational logic.
4. To analyze synchronous sequential logic.
5. To realize the hazard free circuits and pulse mode sequential Circuits.

OUTCOME:

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

1. BASIC COCEPTS AND BOOLEAN ALGEBRA **9**

Number systems - Binary, Octal, Decimal, Hexadecimal, conversion from one to another, complement arithmetic, Boolean theorems of Boolean algebra, Sum of products and product of sums, Minters and Maxterms, Karnaugh map, Tabulation and computer aided minimization procedures.

2. LOGIC GATES **9**

RTL, DTL, TTL, ECL, ICL, HTL, NMOS & CMOS logic gates, Circuit diagram and analysis characteristics and specifications, tri-state gates.

3. COMBINATIONAL CIRCUITS **9**

Problem formulation and design of combinational circuits, Adder / Subtractor, Encoder / decoder, Mux / Demux, Code-converters, Comparators, Implementation of combinational logic using standard ICs, ROM, EPROM, EEPROM, Basics of PLD, PAL, PLA and their use in combinational circuit design.

4. SEQUENTIAL CIRCUITS **9**

Flip flops - SR, JK, T, D, Master/Slave FF, Triggering of FF, Analysis of clocked sequential circuits - their design, State minimization, state assignment, Circuit implementation, Registers-Shift registers, Ripple counters, Synchronous counters, Timing signal, RAM, Memory decoding, Semiconductor memories.

5. FUNDAMENTAL MODE SEQUENTIAL CIRCUITS **9**

Stable, Unstable states, Output specifications, Cycles and Races, Race free Assignments, Hazards, Essential hazards, Pulse mode sequential circuits.

TOTAL HOURS: 45

TEXT BOOKS:

1. Morris Mano, “Digital logic and Computer Design ", Prentice-Hall of India, 1998.
2.William I. Fletcher, “An Engineering Approach to Digital Design ", Prentice-Hall of India, 1980.
3.Floyd T.L., “Digital Fundamentals ", Charles E. Merrill publishing Company, 1982.
4.Tokheim R.L., “Digital Electronics - Principles and Applications ", Tata McGraw Hill, 1999.
5.Jain R.P., “Modern Digital Electronics ", Tata McGraw Hill, 1999.

SEMESTER-III
DATA STRUCTURES
(Common for CSE/IT/ EEE/EIE/ECE/MECT)

L	P	T	C
3	0	0	3

AIM:
The aim is to introduce the concept of storage data using list, stack and queue implementation in various structures

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: 45

TEXT BOOK
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

(Common to CSE/ IT/ EEE/EIE/ECE/BME)

L	P	T	C
3	0	0	3

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: 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

COMPUTER ARCHITECTURE

(Common to CSE/ IT)

L	P	T	C
3	0	0	3

AIM:

To understand the organization of a computer, and the hardware-software interface.

OBJECTIVES:

- To know about the various components of a computer and their internals.
- To comprehend the importance of the hardware-software interface, and instruction set architecture.
- To understand the architectural features of superscalar processors.

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 BASIC STRUCTURE OF COMPUTERS 9

Functional units - Basic operational concepts - Bus structures - Software performance – Memory locations and addresses – Memory operations – Instruction and instruction sequencing – Addressing modes – Assembly language – Basic I/O operations – Stacks and queues.

UNIT II ARITHMETIC UNIT 9

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

UNIT III BASIC PROCESSING UNIT 9

Fundamental concepts – Execution of a complete instruction – Multiple bus organization – Hardwired control – Microprogrammed control - Pipelining – Basic concepts – Data hazards – Instruction hazards – Influence on Instruction sets – Data path and control consideration – Superscalar operation.

UNIT IV MEMORY SYSTEM 9

Basic concepts – Semiconductor RAMs - ROMs – Speed - size and cost – Cache memories - Performance consideration – Virtual memory- Memory Management requirements – Secondary storage.

UNIT V I/O ORGANIZATION 9

Accessing I/O devices – Interrupts – Direct Memory Access – Buses – Interface circuits – Standard I/O Interfaces (PCI, SCSI, USB).

TOTAL : 45

TEXT BOOKS

1. Carl Hamacher, Zvonko Vranesic and Safwat Zaky, 5th Edition “Computer Organization”, McGraw-Hill, 2002.

REFERENCES

1. William Stallings, "Computer Organization and Architecture – Designing for Performance", 6th Edition, Pearson Education, 2003.
2. David A.Patterson and John L.Hennessy, "Computer Organization and Design: The hardware / software interface", 2nd Edition, Morgan Kaufmann, 2002.
3. John P.Hayes, "Computer Architecture and Organization", 3rd Edition, McGraw-Hill, 1998.

SEMESTER-III
SYSTEM SOFTWARE

L	P	T	C
3	0	0	3

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 debuggers.

UNIT I INTRODUCTION **8**

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

UNIT II ASSEMBLERS **10**

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

UNIT III LOADERS AND LINKERS **9**

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

UNIT IV MACRO PROCESSORS **9**

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

UNIT V SYSTEM SOFTWARE TOOLS **9**

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

TOTAL= 45 PERIODS

TEXT BOOK:

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-III
DIGITAL ELECTRONICS LAB
(Common for ECE/CSE/IT/ EIE)

L	P	T	C
0	4	0	2

Aim:

To provide the knowledge of design and implementation of digital circuits using logic gates and flip flops.

Objectives:

Designing the basic digital circuits like adders, subtractors, code converters, magnitude converters using logic gates and counters using flip flops.

List of Experiments:

1. Design and implementation of Adders using logic gates
2. Design and implementation of Subtractors using logic gates
3. Design and implementation of BCD to Excess -3 code converter using logic gates
4. Design and implementation of Binary to Gray code converter using logic gates
5. Design and implementation of 4 bit BCD adder using IC 7483
6. Design and implementation of 2 Bit Magnitude comparator using logic gates
7. Design and implementation of Multiplexer and De-Multiplexer using logic gates
8. Design and implementation of encoder and decoder using logic gates
9. Design and implementation of 3 bit synchronous up/down counter
10. Implementation of SISO, SIPO, and PISO shift registers using flip flops

SEMESTER-III
DATA STRUCTURES LAB
(Common for CSE/ IT/ EEE/EIE/ECE/MECT/BME)

L	P	T	C
0	4	0	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
(Common for CSE/IT/ECE/EEE/EIE/MECT/BME)

L	P	T	C
0	4	0	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.
- Implement various types of polymorphism & the use of pointers for virtual functions.

List of Experiments

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

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

SEMESTER-IV

PROBABILITY AND QUEUEING THEORY

(Common for CSE / IT)

(Statistical table permitted for examination)

L	P	T	C
3	0	1	4

Aim:

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

Objectives:

- **The theory of probability had its origin in gambling and games of chance.**
- **Common applications of this distribution range from scientific and engineering applications to military and medical ones like Formulation of Business Problem Models, traffic flow, lottery tickets etc.**
- **In the analysis of electrical systems, signal processing operations can be viewed as transformations of a set of input variables into a set of output variables. If these variables are random variables then we can use probability distribution.**
- **For random variables varies with time one needs the knowledge of random processes. Markov Process and Markovian Queues will be helpful to students in learning and using other subjects**
- **Queueing theory is part and parcel of computer 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.**

L	T	P	C
3	1	0	4

1. **PROBABILITY AND RANDOM VARIABLES** 9

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

2. **STANDARD DISTRIBUTIONS** 9

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

3. **TWO-DIMENSIONAL RANDOM VARIABLES** 9

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

4. **RANDOM PROCESSES, MARKOV CHAIN** 9

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

5. **QUEUEING THEORY** 9

   Markovian queueing models, Little's formula, M/M/1, M/M/C – finite and infinite capacity , M/G/1 Queues, Pollaczek-Khintchinev formula (Statement only)

Tutorial : 15
Total Hours : 60
Credits : 04

TEXT BOOK:

1. G. Balaji, “Probability and Queuing Theory”,G. Balaji Publishers,Chennai (2012)

REFERENCES:

1. T.Veerarajan, “Probability, Statistics and Random processes” (Second Edition), Tata McGraw-Hill Publishing Company Ltd., New Delhi (2006).
2. P.Kandasamy, K.Thilagavathy, K.Gunavathy “ Probability, Random Variables and Random Processes” (First Edition 2003) : S.Chand &Company Ltd., New Delhi
3. Kapur.J.N. and Saxena.H.C.”Mathematical Statistics”,S.Chand & Company Ltd.New Delhi(1997)
4. Dr.A.Singaravelu, “Probability and Queuing Theory”, Meenakshi Agency,Chennai(2012).

SEMESTER-IV

SOFTWARE ENGINEERING & QUALITY ASSURANCE

(Common for CSE / IT)

L	P	T	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:

- Understand quality management processes
- Distinguish between the various activities of quality assurance, quality planning and quality control
- Understand the importance of standards in the quality management process and their impact on the final product

UNIT I SOFTWARE PROCESS **9**

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

UNIT II SOFTWARE PROJECT PLANNING **9**

Project Planning Objectives – Software Scope – Resources – Software Project Estimation – Empirical Estimation Models – Make/Buy Decision

UNIT III SOFTWARE QUALITY ASSURANCE **9**

Quality Concepts – Quality Movement - Software Quality Assurance – Software Reviews – Formal Technical Reviews – Formal Approaches to SQA - Software Reliability – ISO 9000 Quality Standards – SQA Plan

UNIT IV DESIGN CONCEPTS AND PRINCIPLES 9

Design Process – Design Principles – Design Concepts – Effective Modular Design – Design Heuristics for Effective Modularity – Design Model – Design Documentation

UNIT V SOFTWARE TESTING 9

Software Testing Fundamentals – Test Case Design – White Box Testing – Black Box Testing – Unit Testing – Integration Testing – Validation Testing - System Testing

TOTAL: 45

TEXT BOOKS:

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

REFERENCES:

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

2. James F.Peters and Witold Pedrycz,"Software Engineering, An Engineering Approach", Wiley-India, 2007.

SEMESTER-IV
OPERATING SYSTEMS
(Common to CSE/ IT)

L	P	T	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: 45

TEXT BOOK:

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
DATABASE MANAGEMENT SYSTEMS
(Common to CSE/ IT)

L	P	T	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 = 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", FourthEdition, 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-IV

GRAPHICS DESIGN AND MULTIMEDIA ANIMATION

(Common for CSE/ IT)

L	P	T	C
3	0	0	3

AIM

- Introduce students to various two and three dimensional primitives and concepts
- Provide an opportunity for students to represent, design and implement two dimensional and three dimensional objects
- Introduce students to the different media used in multimedia systems.
- Introduce students to the design issues related to multimedia systems.

OBJECTIVES

- Explain two and three dimensional concepts and their applications
- Identify all techniques related to modern graphics programming concepts
- Identify the media used in multimedia systems and to assess their relative advantages and disadvantages relative to both user and system points of view.
- Explain the interaction problems introduced by multimedia (e.g., compression and synchroization)

OUTCOMES

- Understand the concepts of display devices and Line drawing algorithms
- Learn the different types of clipping algorithms and two dimensional transformations.
- Apply the concepts of 3D display methods, transformation and viewing in computer graphics
- Analyzee the surface detection methods, dither techniques, rendering and illumination Models

UNIT I 2D PRIMITIVES 9

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

UNIT II 3D CONCEPTS 9

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

UNIT III GRAPHICS PROGRAMMING 9

Color Models – RGB, YIQ, CMY, HSV – Animations – General Computer Animation, Raster, Keyframe - Graphics programming using OPENGL / Blender – Basic graphics primitives – Drawing three dimensional objects.

UNIT IV MULTIMEDIA BASICS 9

Introduction and definitions – applications - elements - Compression – Types of compressions - Lossless, Lossy – Video compression – Image Compression – Audio compression - Data and file format.

UNIT V MULTIMEDIA SYSTEMS 9

Multimedia Authoring Systems – Hypermedia Design considerations – User Interface Design – Object Display and Play back issues- Hypermedia Messaging- Distributed Multimedia Systems – Components – multimedia Object Servers – Managing Distributed Objects.

TOTAL: 45

TEXT BOOKS:

1. Donald Hearn, M.Pauline Baker, “Computer Graphics – C Version”, second edition, Pearson Education,2004
2. Prabhat K Andleigh, Kiran Thakrar, “Multimedia systems design”, PHI, 2007.

REFERENCES

1 1.F.S.Hill, “Computer Graphics using OPENGL” , Second edition, Pearson Education,2003.

2 Ralf Steinmetz and Klara, “Multimedia Computing, Communications and Applications”, Pearson Education, 2004.

SEMESTER-IV
COMPUTER NETWORKS
(COMMON FOR CSE/IT)

L	P	T	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**

Data Communications – Networks - Networks models – OSI model – Layers in OSI model – TCP / IP protocol suite – Addressing – Guided and Unguided Transmission media. Switching: Circuit switched networks – Data gram Networks – Virtual circuit networks. Cable networks for Data transmission: Dialup modems – DSL – Cable TV – Cable TV for Data transfer.

UNIT II DATA LINK LAYER **10**

Data link control: Framing – Flow and error control –Protocols for Noiseless and Noisy Channels – HDLC.Multiple access: Random access – Controlled access. Wired LANS: Ethernet – IEEE standards – standard Ethernet – changes in the standard– Fast Ethernet – Gigabit Ethernet. Wireless LANS: IEEE 802.11–Bluetooth. Connecting LANS: Connecting devices - Backbone networks - Virtual LANS.Virtual circuit networks: Architecture and Layers of Frame Relay and ATM.

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 45 PERIODS

TEXT BOOKS

1. Behrouz A. Foruzan, “Data communication and Networking”, Tata McGraw-Hill, 2006: Unit I-IV
2. Andrew S. Tannenbaum, “Computer Networks”, Pearson Education, Fourth Edition, 2003: Unit V

REFERENCE BOOKS

1. Wayne Tomasi, “Introduction to Data Communication and Networking”, 1/e, Pearson

2. James .F. Kurouse & W. Rouse, “Computer Networking: A Top down Approach Featuring”, 3/e, Pearson Education.
3. C.Sivaram Murthy, B.S.Manoj, “Ad hoc Wireless Networks – Architecture and Protocols”, Second Edition, Pearson Education.
4. B.Muthukumaran,’High Performance Networks”, Vijay Nicolle, First Edition, 2005
5.Greg Tomshon, Ed Tittel, David Johnson. “Guide to Networking Essentials”, fifth Edition, Thomson India Learning, 2007.
6. William Stallings, “Data and Computer Communication”, Eighth Edition, Pearson Education, 2000.

SEMESTER-IV
OPERATING SYSTEMS LAB
(COMMON FOR CSE/IT)

L	P	T	C
0	4	0	2

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

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

OUTCOMES

- The student will be familiar with the language and terms of the UNIX/LINUX operating system
- The student will be able to delineate the commands and procedures needed to carry out basic operations on the UNIX/LINUX operating system
- 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
DBMS LAB
(Common to CSE/IT)

L	P	T	C
0	4	0	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.

LIST OF EXPERIMENTS

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
GRAPHICS AND MULTIMEDIA LAB
(Common for CSE /IT)

L	P	T	C
0	4	0	2

Aim

To understand the foundations of computer graphics.

Objectives

- To understand concept of geometric, mathematical and algorithmic concepts necessary for programming computer graphics
- To understand the comprehension of windows, clipping and view-ports object representation in relation to images displayed on screen.
- To understand the software utilized in constructing computer graphics applications.

Outcomes

- The challenges of producing realistic 3D computer graphics
- The maths behind the coordinate systems and transforms used in 3D computer graphics
- The physics behind light, illumination and shading
- Low level techniques for rendering lines, polygons and text, and solving hidden surface visibility
- Physics based models of games and simulations

LIST OF EXPERIMENTS

1. To implement Bresenham's algorithms for line, circle and ellipse drawing
2. To perform 2D Transformations such as translation, rotation, scaling, reflection and sharing using 2D Animation software
3. To perform 3D Transformations such as translation, rotation and scaling.
   3D viewing, 3D transformations using 3D Animation software.
4. Developing interactive multimedia applications-Authoring a 2D presentation: (storyboard, design layout, collect the content, Presentation) using 2 D animation software.
5. Creating simple 3D animations and visualizations.
6. 2D Animation – To create Interactive animation using any animation software
7. Image Editing and Manipulation - Basic Operations on image using any image editing software, Creating gif animated images, Image optimization
8. Create a storyboard and script for an animation.
9. Complete a computer animation demonstrating the use of the basic elements and principles of art and design to communicate specific ideas, moods or feelings.
10. Manipulate and synchronize the sound to the animation

Required software

Algorithm based Implementations: C,C++ (free ware)
2D Animation softwares: Pencil , Synfig Studio,Open GL (Open source)
3D Animation softwares : Blender, OpenFx, (Open source)

VALUE ADDED COURSE

PROFESSIONAL COMMUNICATION AND PERSONALITY DEVELOPMENT

L	P	T	C
0	4	0	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)

METHODOLOGY

- Modular Evaluation will be done based on Continuous Internal Assessment as Assignments, Short Communications, Proposals, Briefs, Reports, etc.
- Final Evaluation will be based on a Real-time research article based on current research carried out in the Institution or by any Faculty of the Institution (Good articles can be submitted to Journals co-authored by the Student and Faculty, with affiliation to the Institution)

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.

UNIT 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
(Common for CSE/ IT)

L	P	T	C
3	0	1	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.
- To understand Boolean algebra and its application to switching theory.

Outcome:

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

1.PROPOSITIONAL CALCULUS **9**

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.

2.**PREDICATE CALCULUS** **9**

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.

3.COMBINATORICS **9**

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

4.GROUPS **9**

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

5.LATTICES **9**

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

Tutorial : 15
Total Hours : 60
Credits : 04

Text Books:

1. G.,.Balaji, “Discrete Mathematics”, Balaji Publishers, Chennai(2011)

Reference:

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. Dr.A.Singaravelu,”Discrete Mathematics” ,Meenakshi Publishers,Chennai
3. Kenneth H.Rosen,” Discrete Mathematics and its Applications”,Fifth Edition,Tata McGraw-Hill Pub.Co.Ltd., New Delhi,2003.

SEMESTER-V

PROGRAMMING AND INTERFACING WITH PROCESSORS

(Common to CSE/ IT)

L	P	T	C
3	0	0	3

Objective:

To Study the architecture of Processors and to get trained in ALP. To study the various interfacing chips and the techniques of interfacing with processors

Aim:

- To study the architecture and basic programming concepts with 8085
- To study the techniques of ALP
- To study the architecture and Programming concepts with 8086
- To study the interfacing techniques with general purpose interfacing chips
- To study the interfacing techniques with special purpose interfacing chips

Outcome :

- Developed in students the assembly language programming skills and real time applications of microprocessor.
- Described the function of each pin 8085 microprocessor and addressing modes of 8085.
- Students can get knowledge of 8086 instruction set and ability to utilize it in programming.
- Students known in depth understanding of interfacing of microprocessors.

UNIT I: STUDY OF 8085 **10**

Processor based system with bus architecture-Processor Initiated Operations and 8085 Bus Organization-Internal data operations and 8085 Registers-Externally Initiated Operations-8085 Processor Pin out and Signals-8085 MPU and its Architecture-8085 Programming model-Instruction format-Machine code format-Data Format-Classification of Instructions – Addressing modes of 8085-Instruction set of 8085-Program format-Delimiters-Definitions of Instruction cycle, Machine cycle and T-state-Timing diagram (MOV r1,r2 ; IN ; LXI rp, 16bit data; MOV r, M; MVI r, data ; LDA)

UNIT II: PROGRAMMING WITH 8085 **9**

LOOPING, COUNTER, TIME DELAY, STACK, SUBROUTINE, CALL & RET instruction execution using timing diagram, RESTART as software instruction.Programs-Addition (8bit, 16 bit, multi byte)-Subtraction (8 bit, 16bit)-BCD Addition – Multi byte addition-Sum of an array -16 bit addition – Factorial –Multiplication-Division-Block Transfer-Sorting- Code conversion (BCD to HEX,HEX to BCD), Fibonacci series

UNIT III: STUDY AND PROGRAMMING WITH 8086 **9**

Software model of 8086- Physical memory organization – Physical address computation -8086 architecture-8086 bus operation with ADD AX, [BX]- 8086 signals – Addressing modes of 8086-Instruction format – Instruction set - 8086 interrupts & IVT –Stack structure of 8086-Assembler directives -Macros –Programming with 8086- Addition, Subtraction, Multiplication and Division (8bit & 16bit)

UNIT IV: GENERAL PURPOSE INTERFACING **8**

8255-Block diagram-control logic, control word, BSR mode, 8253-block diagram-signals-control word format, modes of operation with waveforms, 8259-block diagram, signals, interrupt operation, modes and other features

UNIT V: SPECIAL PURPOSE INTERFACING **10**

8279-Block Diagram, Signals, Modes of operations, Command words, Basic concepts in serial I/O, 8251-Methods of data communication, Block diagram, Signals, Modes of operation, Control words s,8237-Basic DMA operation, Block diagram, Signals, Modes of operation,8272- Types of Floppy disks and their operations, Block diagram, Signals, Commands, 8275- Block diagram, Signals, Display formats, Operational features, Command set.

TOTAL HOURS: 45

TEXT BOOKS

1. Ramesh S.Gaonkar, "Microprocessor - Architecture, Programming and Applications with the 8085", Penram International publishing private limited, fifth edition.

2. A.K.Ray & K.M.Bhurchandi, "Advanced Microprocessors and peripherals- Architectures, Programming and Interfacing", TMH, 2002 reprint.

REFERENCES

1. Douglas V.Hall, "Microprocessors and Interfacing: Programming and Hardware", TMH, Third edition

SEMESTER-V
JAVA PROGRAMMING
(Common CSE/ IT)

L	P	T	C
3	0	0	3

AIM

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

OBJECTIVES:

1. Understand fundamentals of programming such as variables, conditional and iterative execution, methods, etc.
2. Understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.
3. Be aware of the important topics and principles of software development.

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 **9**

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

UNIT II **10**

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

UNIT III **10**

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

UNIT IV **8**

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

UNIT V **8**

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

TOTAL= 45

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.

SEMESTER-V

OBJECT ORIENTED ANALYSIS AND DESIGN

(Common to CSE /IT)

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: 45

TEXT BOOKS

1. Ali Bahrami, “Object Oriented Systems Development”, Tata McGraw-Hill, 1999 (Unit I, III, IV, V).
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-V
DATA WAREHOUSING AND MINING

L	P	T	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:

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

- 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:

The Student should be able to

- Illustrate the concepts of data mining and data warehousing concepts and techniques.
- Apply data mining techniques using data mining tools.
- Implement different data mining techniques and algorithms
- Do webmining and spatial mining
- Implement data ware house

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, Categorisation 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 : 45

TEXT BOOK

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

REFERENCES

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

SEMESTER-V
ASSEMBLY LANGUAGE PROGRAMMING LAB
(Common to CSE/IT)

L	P	T	C
0	4	0	2

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

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

OUTCOME:
1. Understanding of the arithmetic operations ,code conversions using 8085.
2. Students can get acquired knowledge to write programs on 8085/8086.
3. Ability to interface the various devices to microprocessors.

List of Experiments:

A. 8085 Programming

Study of 8085 Microprocessor.
Programs-Addition (8bit, 16 bit, Multi byte, Array)
Subtraction (8 bit, 16bit)
BCD Addition
Factorial
Multiplication & Division-
Block Transfer-
Sorting & Searching
Code conversion (BCD to HEX, HEX to BCD)
Fibonacci series

B. 8086 Programming
Study of 8086 Microprocessor.
16 bit & 32 bit Addition, 16 bit multiplication, 16 bit division
Ascending Order and Descending Order.
Reversal of a String.

C. Interfacing Experiments
Keyboard and Display Interface
Stepper Motor Interface
Traffic Signal Modeling
Only for Demonstration:-
6 modes of Timer
8251 interface
8272 interface
8237 Interface

SEMESTER-V
JAVA PROGRAMMING LAB
(Common for CSE/ IT)

L	P	T	C
0	4	0	2

AIM:

To write and execute programs in JAVA

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

1. Write a JAVA program to search the largest element from the given array.
2. Write a JAVA program to sort the strings in an alphabetical order.
3. Write a JAVA program to extract a portion of a character string and to print the extracted portion and the remaining portion of the string. Assume that m characters are extracted, starting with the nth character
4. Write a JAVA program for illustrating overloading and overriding methods in JAVA.
5. Define a class Baby with the following attributes:
    a. Name
    b. Date of birth
    c. Date on which BCG injection has to be given. (60 days from date of birth)
    d. Date on which Polio drops is to be given. (45 days from date of birth)
    e. Write a constructor to construct the Baby object. The constructor must find out BCG and polio drops dates from the date of birth. In the main program define a baby and display its details.
6. Define a class called Employee with name and date of appointment. Create 5 employee objects as an array and sort them as per their date of appointment. That is, print them as per their seniority.
7. Assume that a bank maintains two kinds of account for its customers, one called savings account and the other current account. The savings account provides compound interest for an amount that remains in the a/c for more than 45 days and withdrawal facilities but no cheque book facility. The current account provides simple interest for an amount that remains in the a/c for more than one month & also it provides cheque book facility. Current account holders should also maintain a minimum balance and if the balance fails below this level, a service charge is imposed.

8. Create a class Account that stores customer name, account number and type of account. From this derive the classes Curr-acct and Sav-acct to make them more specific to their requirements. Include the necessary methods in order to achieve the following tasks:
    a. Accept deposit from a customer and update the balance.
    b. Display the balance.
    c. Compute and deposit interest.
    d. Permit withdrawal and update the balance.
    e. Check for the minimum balance, impose penalty, if necessary, and update the balance.
    f. Do not use any constructors. Use methods to initialize the class members.
9. Write a JAVA program which illustrates the implementation of multiple inheritance using interfaces in JAVA.
10. Write a JAVA program to create your package for basic mathematical operations such as add, subtract, multiply. Demonstrate the use of this package in another class.
11. Write a JAVA program that counts the number of digits in a given number. If an alphabet is entered instead of a number, the program should not terminate. Instead it should display appropriate error message.
12. Write a JAVA program that moves the text "School of Computer Sciences welcomes you" diagonally using Applet.
13. Write a JAVA program to create an Applet with a label "Do you know car driving?" and two buttons Yes, NO. When the user clicks "Yes" button, the message "Congrats" must be displayed. When the user clicks "NO "button, "Regrets" must be displayed.
14. Write a JAVA program to animate the face image using Applet.
15. Write a JAVA program to create four Text fields for the name, street, city and pin code with suitable Labels. Also add a button called "My Details". When you click the button, your name, street, city, and pin code must appear in the Text fields.

SEMESTER-V

CASE TOOLS LAB

(Common for CSE/IT)

L	P	T	C
0	4	0	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

SUGGESTED LIST OF APPLICATIONS

1. Student Marks Analyzing System
2. Quiz System
3. Online Ticket Reservation System
4. Payroll System
5. Course Registration System
6. Expert Systems
7. ATM Systems
8. Stock Maintenance
9. Real-Time Scheduler
10. Remote Procedure Call Implementation

SEMESTER-VI

CRYPTOGRAPHY & NETWORK SECURITY

(COMMON FOR CSE/ IT)

L	P	T	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:

The student should be able to

- Identify and classify computer and security threats and develop a security model to prevent, detect and recover from attacks.
- Encrypt and decrypt messages using block ciphers.
- Demonstrate techniques to Sign and verify messages using well-known signature generation and verification algorithms.
- Develop code to implement a cryptographic algorithm or write an analysis report on any existing security product.
- Understand and demonstrate the technologies to protect cipher space against security threats

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. 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, 4th ed, 2006.

REFERENCES

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

SEMESTER-VI
WEB TECHNOLOGY
(COMMON FOR CSE/IT)

L	P	T	C
3	0	0	3

AIM:

To provide an introduction to Java and basic 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 introduce the features of object oriented programming languages using Java
- 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.
- 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 NETWORK AND WEB CONCEPTS 6

History of the Internet and World Wide Web – HTML 4 protocols – HTTP, SMTP, POP3, MIME, and IMAP. Introduction to JAVA Scripts – Object Based Scripting for the web. Structures – Functions – Arrays – Objects - Internet standards – TCP and UDP protocols – URLs – MIME – CGI – Introduction to SGML.

UNIT II SCRIPTING LANGUAGES & DYNAMIC HTML 9

HTML – forms – frames – tables – web page design - JavaScript introduction – control structures – functions – arrays – objects – simple web applications, Dynamic HTML – introduction – cascading style sheets – object model and collections – event model – filters and transition – data binding – data control – ActiveX control

UNIT III DATABASE- ASP – XML 12

Database, Relational Database model – Overview, SQL – ASP – Working of ASP – Objects – File System Objects – Session tracking and cookies – ADO – Access a Database from ASP – Server side Active-X Components – Web Resources – XML – Structure in Data – Name spaces – DTD – Vocabularies – DOM methods.

UNIT IV SERVER SIDE PROGRAMMING 9

IIS – Internet Information Server – web server (Java web server / Tomcat / Web logic) – HTTP GET and POST requests – session tracking – cookies – JDBC – simple web applications – multi-tier applications.

UNIT V SERVLETS AND JSP 9

Introduction – Servlet Overview Architecture – Handling HTTP Request – Get and post request – redirecting request – multi-tier applications – JSP – Overview – Objects – scripting – Standard Actions – Directives.

TOTAL : 45

TEXT BOOK

1. Deitel & Deitel, Goldberg, “Internet and World Wide Web – How to Program”, Pearson Education Asia, 2001.
2. Elliotte Rusty Harold, “Java Network Programming”, O’Reilly Publishers, 2002

REFERENCES

1. Eric Ladd, Jim O' Donnel, "Using HTML 4, XML and JAVA", Prentice Hall of India – QUE, 1999.
2. Aferganatel, "Web Programming: Desktop Management", PHI, 2004.
3. Rajkamal, "Web Technology", Tata McGraw-Hill, 2001.
4. R. Krishnamoorthy & S. Prabhu, "Internet and Java Programming", New Age International Publishers, 2004.
5. Thomno A. Powell, "The Complete Reference HTML and XHTML", fourth edition, Tata McGraw Hill, 2003.
6. Naughton, "The Complete Reference – Java2", Tata McGraw-Hill, 3rd edition, 1999.

SEMESTER-VI
ADVANCED JAVA PROGRAMMING
(Common for CSE, IT)

L	P	T	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:

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

OUTCOMES:

The students should be able to

- 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 : 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.

SEMESTER-VI

PRINCIPLES OF COMPILER DESIGN

L	P	T	C
3	0	0	3

AIM:

To understand the design and implementation of a simple compiler.

OBJECTIVES:

- To understand the functions of the various phases of a complier
- To learn the overview of the design of lexical analyzer and parser
- To study the design of the other phases in detail.
- To learn the use of compiler construction tools.:Understand the basic principles of the compiler, Compiler construction tools and lexical analysis.
- Learn the Concept of Context Free Grammars, Parsing and various Parsing Techniques.
- Learn the process of intermediate code generation.
- Learn the process of Code Generation and various Code optimization techniques.

OUTCOMES:

The students should be able to

- 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

UNIT I LEXICAL ANALYSIS 9

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

UNIT II SYNTAX ANALYSIS AND RUN-TIME ENVIRONMENTS 9

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

UNIT III INTERMEDIATE CODE GENERATION 9

Intermediate languages-Declarations-Assignment statements - Boolean expressions- Case statements- Back patching-Procedure calls

UNIT IV CODE GENERATION 9

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

UNIT V CODE OPTIMIZATION 9

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

TOTAL: 45

TEXT BOOK:

1. Alfred V. Aho, Ravi Sethi Jeffrey D. Ullman, "Compilers- Principles, Techniques, and Tools", Pearson Education Asia, 2007.

REFERENCES:

1. David Galles, “Modern Compiler Design”,Pearson Education Asia, 2007
2. Steven S. Muchnick, “Advanced Compiler Design & Implementation”,Morgan Kaufmann Pulishers, 2000.
3. C. N. Fisher and R. J. LeBlanc “Crafting a Compiler with C”, Pearson Education, 2000.

SEMESTER-VI
ARTIFICIAL INTELLIGENCE

L	P	T	C
3	0	0	3

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-Reasoning Systems for Categories-Reasoning With Default Information

UNIT IV-MACHINE LEARNING **9**

Bayes Rule and Its Applications-Bayesian Networks-Inferences in Bayesian Networks-Hidden Markov Models-Learning from Observation-Supervised Learning-Inductive Learning-Decision Trees-Statistical Learning Methods-Reinforcement 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
ADVANCED JAVA PROGRAMMING LAB
(Common for CSE, IT)

L	P	T	C
0	4	0	2

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:

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

OUTCOMES:

The students should be able to

- 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

List of Experiments

1. Write a Java Program to implement multithreading(three threads using single run method).
2. Write a Java Program to implement the calculator.
3. Write a Java Program to implement the URL.
4. Write a Java Program to implement the InetAddress.
5. Write a Java Program for Sending E-mail in Java.
6. Write a Java Program to implement Single Client-Server Communication.
7. Write a Java Program to implement the Login_Id Form using JDBC.
8. Write a Java Program to implement the SQL commands using JDBC.
9. Write a Java Program to implement the JTrees.
10. Write a Java Program to implement the JTable.
11. Write a Java Program to create the table using JDBC.
12. Write a Java Program to implement Remote Method Invocation.
13. Write a Java Program to implement CORBA technology

SEMESTER-VI

WEB TECHNOLOGY LAB
(Common for CSE, IT)

L	P	T	C
0	4	0	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-VI
COMPILER DESIGN LAB

L	P	T	C
0	4	2	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-VII
BUSINESS INTELLIGENCE AND ITS APPLICATIONS
(COMMON FOR CSE/IT)

L	P	T	C
3	0	0	3

Aim:

Business Intelligence (*BI*) is a broad category of software *applications* and technologies used to gather, store, analyse, and access data

Objectives

This subject enables students to

1. master the basics in business intelligence (BI), data mining (DM), and knowledge discovery in databases;
2. learn the role that software tools/applications play in BI and DM, with emphasis on industrial case studies and practical applications;

Have an overall understanding of the major issues and applications in business intelligence and data mining, including a basic grasp of the algorithm classes and best practices for building successful BI projects.

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 INTELLIGENCE 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 (Extraction Transformation Loading) 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 : 45

TEXT BOOKS

RN Prasad, Seema Acharya, "Fundamentals Of Business Analytics" Wiley India,2011

REFERENCE BOOKS

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-VII

ENGINEERING MANAGEMENT& ETHICS

(Common to All Branches)

L	P	T	C
3	0	0	3

AIM:

To sensitize the engineering students on blending both technical and ethical responsibilities.

OBJECTIVES:

- Identify the core values that shape the ethical behavior of an engineer.
- Utilize opportunities to explore one's own values in ethical issues.
- Become aware of ethical concerns and conflicts.
- Enhance familiarity with codes of conduct.
- Increase the ability to recognize and resolve ethical dilemmas.

OUTCOMES:

- Retrieve information via problem identification, validation and data collection and analysis then deliver reports either written or verbal, Demonstrate organizational management roles/functions, characteristics and responsibilities,
  Problem solving and decision making in Engineering management
  Demonstrate basic skills in the understanding of:

- Human resource management and training
- Teamwork, leadership and discipline,
- Staff selection, personnel procedures and training
- Introduction to project management
- Fundamentals of ethics and environmental impacts

UNIT-I : HISTORICAL DEVELOPMENT **9**

Definition of Management – Science or Art – management and Administration – Contribution of Taylor and Fayol – Functions of Management - planning – Steps involved in Planning – Objectives – Setting objectives – Process of managing by objectives – Decision making.

UNIT-II : ORGANISING & DIRECTING **9**

Nature and Purpose – Organization Chart – Structure and process – Departmentation – Benefits and Limitations – Staffing – Selection process – Techniques – leadership – Types of leadership – Motivation theories – Motivational Techniques – Communication – Process, Barriers & Effective Communication.

UNIT-III : CONTROLLING **9**

System and Process of Controlling – Requirements for effective control – The Budget as Control Technique – Information Technology in Controlling – Use of Computers in handling the information – Productivity – problems and management - Control of Overall Performance – Direct and Preventive Control – Reporting.

UNIT-IV : ENGINEERING ETHICS **9**

Safety and risk – Assessment of safety and risk – Risk benefit analysis – Engineering Ethics – Variety of moral issues – Types of inquiry – Moral autonomy – Kohlberg's theory – Gilligan's theory –

Consensus and Controversy – Models of Professional Roles – Theories about right action – Self-interest - Uses of ethical theories.

UNIT-V : RESPONSIBILITIES AND RIGHTS **9**

Collegiality and loyalty – Respect for authority – Collective Bargaining – Confidentiality – occupational crime – Professional rights – Employee rights – Intellectual Property Rights (IPR) – Moral leadership – Sample code of conduct.

TOTAL : 45

TEXT BOOKS

1. Harld Kooritz & Heinz Weihrich "Essentials of management", Tata McGraw –Hill, 1998.
2. Joseph L Massie, "Essentials of management", prentice hall of india, (Pearson) Fourth Edition, 2003.
3. Mike martin and Ronald Schinzinger, "Ethics in Eingineering", McGraw Hill, New york, 1996.

REFERENCES

1. Tripathy PC and reddy PN, " Principles of Management", Tata Mcgraw Hill, 1999.
2. Decenzo David, Robin Stephen A, "Personnel and Human Reasons Management ", Prentice hall of India, 1996.
3. JAF Stomer, Freeman R.E and Daniel R Gilbert Management, Pearson Education, Sixth Edition, 2004.
4. Fraidoon Mazda, "Engineering Management", Addison Wesley, 2000.
5. Charles D Fleddermann,"Engineering Ethics", Prentice Hall, New Mexico, 1999.
6. Laura Schlesinger, "How Could You Do That: the Abdication of Character, Courage,and Conscience", Harper Collins, New York, 1996.
7. Stephen Carter, "Integrity", Basic Books, New York, 1996.
8. Tom Rusk, "The Power of Ethical Persuasion: From Conflict to Partnership at Work and in Private Life", Viking, New York, 1993

SEMESTER-VII
INFORMATION SECURITY
(Common for CSE/ IT/ECE/ MECT/EEE/EIE/BME)

L	P	T	C
3	0	0	3

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

OBJECTIVES
1. To understand the basics of Information Security
2. To know the legal, ethical and professional issues in Information Security
3. To know the aspects of risk management
4. To become aware of various standards in this area
5. To know the technological aspects of Information Security

OUTCOMES:

The students should be able to
- possess the knowledge of the fundamental concepts of security
- Securely program servers and clients
- Have understood the database security models.
- Implement security mechanisms for risk management
- Design Intrusion Detection System
- Do log analysis
- Understand firewalls

UNIT 1 INTRODUCTION **9**

History, What is Information Security?, Critical Characteristics of Information, NSTISSC Security Model, Components of an Information System, Securing the Components, Balancing Security and Access, The SDLC, The Security SDLC

UNIT II SECURITY INVESTIGATION 9

Need for Security, Business Needs, Threats, Attacks, Legal, Ethical and Professional Issues

UNIT III SECURITY ANALYSIS **9**

Risk Management: Identifying and Assessing Risk, Assessing and Controlling Risk

UNIT IV LOGICAL DESIGN **9**

Blueprint for Security, Information Security Poicy, Standards and Practices, ISO 17799/BS 7799, NIST Models, VISA International Security Model, Design of Security Architecture, Planning for Continuity

UNIT V PHYSICAL DESIGN **9**

Security Technology, IDS, Scanning and Analysis Tools, Cryptography, Access Control Devices, Physical Security, Security and Personnel

TOTAL : 45

TEXT BOOK

Michael E Whitman and Herbert J Mattord, “Principles of Information Security”, Vikas Publishing House, New Delhi, 2003

REFERENCES

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

SEMESTER-VII
SOFTWARE TESTING
(Common for CSE, IT)

L	P	T	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
- To identify the need for testing
- To prepare testing policies and standards
- To use testing aids and tools
- To test before buying a software package
- 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 INTRODUCTION 8

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

UNIT II TEST CASE DESIGN 11

Introduction to Testing Design Strategies, The Smarter Tester, Test Case Design Strategies, Using Black Box Approach to Test Case Design, Random Testing, Equivalence Class Partitioning, Boundary Value Analysis, Other Black-box Test Design Approaches, Black-box testing and COTS, Using White-Box Approach to Test design, Test Adequacy Criteria, Coverage and Control Flow Graphs, Covering Code Logic, Paths:Their Role in White-box Based Test Design, Additional White Box Test Design Approaches, Evaluating Test Adequacy Criteria

UNIT III LEVELS OF TESTING 9

The Need for Levels of Testing, Unit Test, Unit Test Planning, Designing the Unit Tests. The Class as a Testable Unit, The Test Harness, Running the Unit tests and Recording results, Integration tests, Designing Integration Tests, Integration Test Planning, System Test – The Different Types, Regression Testing, Alpha, Beta and Acceptance Tests

UNIT IV TEST MANAGEMENT 9

Introductory Concepts, Testing and Debugging Goals and Policies, Test Planning, Test Plan Components, Test Plan Attachments, Locating Test Items, Reporting Test Results, The role of three groups in Test Planning and Policy Development, Process and the Engineering Disciplines, Introducing the test specialist, Skills needed by a test specialist, Building a Testing Group

UNIT V CONTROLLING AND MONITORING 8

Defining Terms, Measurements and Milestones for Controlling and Monitoring, Status Meetings, Reports and Control Issues, Criteria for Test Completion, SCM, Types of reviews, Developing a review program, Components of Review Plans, Reporting review results

TOTAL : 45

TEXT BOOK

1. Ilene Burnstein, "Practical Software Testing", Springer International Edition, Chennai, 2003

REFERENCES

1. Edward Kit, "Software Testing in the Real World – Improving the Process", Pearson Education, New Delhi, 1995
2. Elfriede Dustin, "Effective Software Testing", Pearson Education, New Delhi, 2003
3. Renu Rajani and Pradeep Oak, "Software Testing – Effective Methods, Tools and Techniques."TataMcGraw-Hill,NewDelhi,2003.

SEMESTER-VII

C# AND .NET Framework

(Common for CSE, IT)

L	P	T	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

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 DataGridView Control - DataGridView 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.

TEXT BOOK:

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

REFERNCE BOOKS:

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

SOFTWARE TESTING LAB

(Common for CSE/IT)

L	P	T	C
0	4	0	2

AIM:

To understand the various testing tools and their use with various testing methodologies

OBJECTIVES:

To study the working of testing tools
To apply the fundamental testing techniques associated with software project development
To automate various testing strategies in specific domains

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

List of Experiments

1. Study of various tools for software testing such as WinRunner, LoadRunner, Rational Rose Test Suite etc.,

2. Performing the following testing using the testing tools
    a. Requirements testing
    b. Use-case scenario testing
    c. Design testing
    d. Code testing
    e. Path testing
    f. Code coverage testing
    g. Data-flow testing
    h. Load testing
    i. Regression testing
    j. Documentation testing

3. Mini-project: developing an automated test-case generation tool for domains such as :
    a. web-site development
    b. inventory management
    c. shopping cart
    d. finance management
    e. health-care

SEMESTER-VII

C# AND. NET FRAMEWORK LAB

(Common for CSE, IT)

L	P	T	C
0	4	0	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

List of Experiments

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
MINI PROJECT

L	P	T	C
0	6	0	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.

LIST OF ELECTIVES

CYBER SECURITY
(Common to all Branches)

L	P	T	C
3	0	0	3

AIM

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

OBJECTIVES

1. To understand the basics of Cyber Security
2. To know the legal, ethical and professional issues in Cyber Security
3. 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

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

Antiforensics – Tunneling techniques – Fraud Techniques - Threat Infrastructure.

UNIT III EXPLOITATION

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

UNIT IV MALICIOUS CODE

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

UNIT V DEFENSE AND ANALYSIS TECHNIQUES

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

TEXT BOOK

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

REFERENCE BOOKS

1. By Dan Shoemaker, Ph.D., William Arthur Conklin, Wm Arthur Conklin, "Cybersecurity: 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.

OPEN SOURCE SYSTEMS
(Common to CSE/IT)

L	P	T	C
3	0	0	3

AIM:
The student will get exposure to operating system and networking concepts.

OBJECTIVES:

1. To learn about GNU/Linux based servers and workstation
2. To learn shell programming
3. To learn about application and server software
4. 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: 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.

BUILDING ENTERPRISE APPLICATION

L	P	T	C
3	0	0	3

AIM:

To build enterprise applications with Java framework.

COURSE OBJECTIVE

- To teach the students about various ways to build enterprise applications
- Implement project management plan for large enterprise.
- To understand the role of a software architecture in the development of an enterprise application system
- To examine and compare various architecture view types and styles
- To develop the ability to read and understand the models that are used to document a software architecture

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: **3 Hrs**

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

Unit II: **6 Hrs**

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

Unit III: **2 Hrs**

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 Hrs**

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: **6 Hrs**

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.

- Text Book
  - Raising Enterprise Applications – Published by John Wiley, authored by Anubhav Pradhan, Satheesha B. Nanjappa, Senthil K. Nallasamy, Veerakumar Esakimuthu
  - Building Java Enterprise Applications – Published by O'Reilly Media, authored by Brett McLaughlin
- Reference Book
  - Software Requirements: Styles & Techniques – published by Addison-Wesley Professional
  - Software Systems Requirements Engineering: In Practice – published by McGraw-Hill/Osborne Media
  - Managing Software Requirements: A Use Case Approach, 2/e – published by Pearson
  - Software Architecture: A Case Based Approach – published by Pearson
  - Designing Enterprise Applications with the J2EE Platform (PDF available at- http://java.sun.com/blueprints/guidelines/designing_enterprise_applications_2e/)
  - Software Testing, 2/e – published by Pearson
  - SOFTWARE TESTING Principles and Practices – published by Oxford University Press

RESOURCE MANAGEMENT TECHNIQUES

AIM

To understand the concepts of resource management techniques.

OBJECTIVES:

The student should be made to:
Be familiar with resource management techniques. Learn to solve problems in linear programming and Integer programming. Be exposed to CPM and PERT.

OUTCOMES:

- Make use of simplex method to solve optimization problems.
- Demonstrate the concept of duality to solve shortest route problem
- Explain integer programming method.
- Demonstrate the types of constraints and optimization methods.
- Utilize PERT and CPM in project management.

1. LINEAR PROGRAMMING: 9

Principal components of decision problem – Modeling phases – LP Formulation and graphic solution – Resource allocation problems – Simplex method – Sensitivity analysis.

2. DUALITY AND NETWORKS: 9

Definition of dual problem – Primal – Dual relation ships – Dual simplex methods – Post optimality analysis – Transportation and assignment model shortest route problem.

3. INTEGER PROGRAMMING: 9

Cutting plan algorithm – Branch and bound methods, Multistage (Dynamic) programming.

CLASSICAL OPTIMISATION THEORY: 9

Unconstrained external problems, Newton – Ralphson method – Equality constraints – Jacobean methods – Lagrangian method – Kuhn – Tucker conditions – Simple problems.

OBJECT SCHEDULING: 9

Network diagram representation – Critical path method – Time charts and resource leveling – PERT.

TOTAL = 45

REFERNECES:

1. Anderson ‘Quantitative Methods for Business’, 8th Edition, Thomson Learning, 2002.
2. Winston ‘Operation Research’, Thomson Learning, 2003.
3. H.A.Taha, ‘Operation Research’, Prentice Hall of India, 2002.
4. Vohra, ‘Quantitative Techniques in Management’, Tata McGraw Hill, 2002.
5. Anand Sarma, ‘Operation Research’, Himalaya Publishing House, 2003.

UNIX INTERNALS

L P T C
3 0 0 3

AIM:
To understand file system, process, memory management and I/O in Unix.

OBJECTIVES:
- To Understand the Interface Between Hardware And Software
- To Understand the Process Subsystem
- To Understand the Memory Subsystem
- To Understand Memory Management
- To Study the I/O Subsystem, Device Drivers And Ipc

COURSE OUTCOMES

The student will get exposure to operating system and networking concepts.

UNIT I GENERAL OVERVIEW OF THE SYSTEM 9

History – System structure – User perspective – Operating system services – Assumptions about hardware. Introduction to the Kernel : Architecture of the UNIX operating system – Introduction to system concepts – Kernel data structures – System administration – Summary and Preview.

UNIT II BUFFER CACHE 9

Buffer headers – Structure of the buffer pool – Advantages and disadvantages of the buffer cache. Internal representation of files: Inodes – Structure of a regular file – Directories – Conversion of a path name to an Inode – Super block – Other file types.

UNIT III SYSTEM CALLS FOR FILE SYSTEM 9

Open – Read – Write – File and record locking – Adjusting the position of file I/O –LSEEK – Close – File creation – Creation of special files – Pipes – Dup – Mounting and unmounting file systems

UNIT IV THE STRUCTURE OF PROCESSES 9

Process states and transitions – Layout of system memory – The context of a process – Saving the context of a process. Process Control: Process creation – Signals – Process termination – Awaiting process termination – Invoking other programs – The shell – System boot and the INIT process.

UNIT V PROCESS SCHEDULING AND MEMORY MANAGEMENT POLICIES 9

Process Scheduling – Memory Management Policies : Swapping – A hybrid system with swapping and demand paging. The I/O Subsystem : Driver Interfaces– Disk Drivers-Terminal Drivers.

TOTAL : 45

TEXT BOOK

1. Maurice J. Bach, “The Design of the Unix Operating System”, Prentice Hall of India, 2004.

REFERENCE

1. Vahalia, “Unix Internals: The New Frontiers”, Pearson Education Inc, 2003.

GRID COMPUTING
(COMMON FOR ECE, CSE, IT)

L	P	T	C
3	0	0	3

AIM:

To understand the latest advances in the field of computation to optimize the utilization of resources.

OBJECTIVES:

- To enable resource sharing across networks
- To integrate heterogeneous computing systems and data resources
- with the aim of providing a global computing space
- To manage and schedule the resources in grid environments
- To know the standards and protocols used .
- To Know the middleware in grid computing

OBJECTIVE :

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- GridI CE - 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 = 45 HOURS

TEXT BOOK

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

REFERENCES

1. Ian Foster & Carl Kesselman, "The Grid 2 - Blueprint for a New Computing Infrascture", 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, 2003.

ADVANCED DATABASE TECHNOLOGY

L P T 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.

OUTCOME:

- Decide on configuration issues related to database operation and performance.
- Identify which parameters are tunable and what are the implications
- Analyze and optimize transactional code, identifying causes of possible anomalies and correct them.
- decide on optimization issues given a known database workload , by manipulating indexes
- choosing more adequate data types, and modifying queries.

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 : 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.

THEORY OF COMPUTATION

L	P	T	C
3	0	0	3

AIM:
To have foundation on automata languages and grammar.

OBJECTIVES:
- Develop the concepts and skills necessary to be able to evaluate the compatibility and undecidability.

OUTCOMES:
1.Master regular languages and finite automata.
2. Master context-free languages, push-down automata, and Turing recognizable languages.
3. Be exposed to a broad overview of the theoretical foundations of computer science.
4. Be familiar with thinking analytically and intuitively for problem-solving situations in related areas of theory in computer science.

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

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

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

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

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

TOTAL= 45

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

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

DISTRIBUTED SYSTEMS

L	P	T	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.

COURSE OBJECTIVES

- Present the principles underlying the function of distributed systems and their extension to grid and cloud computing and virtualization techniques.
- Create an awareness of the fundamental technical challenges in advanced distributed systems design and implementation;
- Expose students to current technology used to build architectures to enhance distributed computing infrastructures with various computing principles and paradigms, including grid and cloud computing;

COURSE OUTCOMES

CO1: Understand distributed system and Computing.

CO2: 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;

CO3: Remember what are the issues in operating systems for distributed systems while designing the distributed systems

CO4: Apply distributed Transaction process such as locking and deadlock in distributed systems

CO5: 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:45 PERIODS

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.

REAL TIME SYSTEMS
(COMMON FOR CSE,CSSE)

L P T C
3 0 0 3

AIM:
To study the adaptation of architecture and development methods to support real-time Systems

OBJECTIVES:

- To characterize the problem space real-time systems address and what are the
- specialized requirements of real-time systems
- To describe the solutions for standard problems of real-time systems
- To characterize the solution space real-time systems employ and how these
- solutions tend to differ from other systems
- To describe and justify adaptations to the development process to support real-time
- Systems

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 BASIC REAL TIME CONCEPTS 9

Basic computer architecture – some terminology - real time design issues – example real time systems – input and output – other devices – language features.

UNIT II REAL TIME SPECIFICATION AND DESIGN TECHNIQUES 9

Natural languages – mathematical specification – flow charts – structured charts – pseudocode and programming design languages – finite state automata – data flow diagrams – petri nets – Warnier Orr notation – state charts – polled loop systems – phase / sate driven code – coroutines – interrupt – driven systems – foreground/background system – full featured real time operating systems

UNIT III INTERTASK COMMUNICATION AND SYNCHRONIZATION 9

Buffering data – mailboxes – critical regions – semaphores – deadlock – process stack management – dynamic allocation – static schemes – response time calculation – interrupt latency – time loading and its measurement – scheduling is NP complete – reducing response times and time loading – analysis of memory requirements – reducing memory loading – I/O performance

UNIT IV QUEUING MODELS 9

Probability functions – discrete- basic buffering calculation – classical queuing theory – little's law – erlong's formula – faults, failures, bugs and effects – reliability-testing – fault tolerance – classification of architecture – distributing systems – Non Von Neuman architecture

UNIT V HARDWARE/SOFTWARE INTEGRATION 9

Goals of real time system integration – tools - methodology -software Heinsberg uncertainity principle – real time applications

TOTAL : 45

TEXT BOOK

Philip A.Laplante, “Real time system design and analysis – an engineer's handbook

REFERENCES

C.M.Krishna and Kang G Shin, "Real time systems", TMH, 1997
Stuart Bennelt, "Real time computer control – and introduction", Pearson education, 2003.
Allen Burns, Andy Wellings, “Real Time Systems and Programming Languages”, Pearson Education, 2003.

TCP / IP TECHNOLOGY

L P T C
3 0 0 3

AIM :
To understand the concepts of TCP/IP protocol suite.

OBJECTIVES:

1. To grasp the introduction of OSI model.
2. To understand the layering concepts in computer networks.
3. To understand the functions of each layer.

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

1. INTRODUCTION 9

Protocols and standards – OSI model – TCP / IP protocol suite – addressing – versions – underlying technologies.

2. 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.

3. 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.

4. TCP, UNICAST AND MULTICAST ROUTING 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

5. APPLICATION LAYER, 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.

TEXT BOOKS

1. Behrouz Forouzan, “TCP/IP protocol suite “, 2nd edition, Tata McGrawhill..

REFERENCE

1. Douglas Comer, “Internetworking with TCP / IP” ,Vol – 1, PHI, 2000.

SOFT COMPUTING
(COMMON FOR CSE/CSSE)

L	P	T	C
3	0	0	3

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 10

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

UNIT II OPTIMIZATION 8

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

UNIT III NEURAL NETWORKS 10

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 8

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

TOTAL : 45

TEXT BOOK

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.

SYSTEM MODELING AND SIMULATION

(Common for CSE,IT)

L	P	T	C
3	0	0	3

AIM:

The aim of this course is to study the system modeling and simulation techniques, which finds application in diverse fields.

OBJECTIVE:

The objective of this course is to introduce the fundamental principles and concepts in the general area of systems and simulation. The purpose is to learn about the overview of computer simulation concepts, overview of modeling theory, review of probability distributions and queuing theory, random number generation, probability distribution generation, data collection and input analysis, discrete modeling and simulation concepts, state based models, Markov models, model validation and verification and some simulation systems and languages.

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

1. INTRODUCTION 8

Systems, modeling, general systems theory, Concept of simulation, Simulation as a decision making tool, types of simulation.

2. RANDOM NUMBERS 9

Pseudo random numbers, methods of generating random variables, discrete and continuous distributions, testing of random numbers.

3. DESIGN OF SIMULATION EXPERIMENTS 10

Problem formulation, data collection and reduction, time flow mechanism, key variables, logic flow chart, starting condition, run size, experimental design consideration, output analysis and interpretation validation.

4. SIMULATION LANGUAGES 8

Comparison and selection of simulation languages, study of anyone simulation language.

5. CASE STUDIES **10**

Development of simulation models using simulation language studied for systems like queuing systems, Production systems, Inventory systems, maintenance and replacement systems and Investment analysis.

TOTAL : 45

TEXT BOOKS

Geoffrey Gordon, "System Simulation", 2nd Edition, Prentice Hall, India, 2002.
Narsingh Deo, "System Simulation with Digital Computer, "Prentice Hall, India, 2001.

REFERENCES

1. Jerry Banks and John S.Carson, Barry L. Nelson, David M.Nicol, "Discrete Event System Simulation", 3rd Edition, Prentice Hall, India, 2002.
2. Shannon, R.E. Systems simulation, The art and science, Prentice Hall, 1975.
3. Thomas J. Schriber, Simulation using GPSS, John Wiley, 1991.

DESIGN AND ANALYSIS OF ALGORITHMS
(Common to CSE/CSSE/MECHT)

L	P	T	C
3	0	0	3

AIM:

The aim is to introduce the basics of algorithm design paradigms and analysis to enable designing of efficient algorithms.

OBJECTIVES:

- To introduce the basic concepts of algorithm analysis
- To introduce the design paradigms for algorithm design
- To introduce the basic complexity theory.

COURSE OUTCOMES

CO1: Understand different data structures and its applications.
CO2: Develop ability to analyze algorithms, to determine algorithm correctness and time efficiency.
CO3: Design data structures for complex computing problems.
CO4: Identify, model, solve and develop code for real life problems like shortest path, network flow, and minimum spanning using graphs
CO5: Evaluate the performance of computing solutions in terms of time and space.

UNIT I **9**

Algorithm Analysis – Time Space Tradeoff – Asymptotic Notations – Conditional asymptotic notation – Removing condition from the conditional asymptotic notation - Properties of big-Oh notation – Recurrence equations – Solving recurrence equations – Analysis of linear search.

UNIT II **9**

Divide and Conquer: General Method – Binary Search – Finding Maximum and Minimum – Merge Sort – Greedy Algorithms: General Method – Container Loading – Knapsack Problem.

UNIT III **9**

Dynamic Programming: General Method – Multistage Graphs – All-Pair shortest paths – Optimal binary search trees – 0/1 Knapsack – Traveling salesperson problem.

UNIT IV **9**

Backtracking: General Method – 8 Queens Problem – sum of subsets – graph coloring – Hamiltonian problem – knapsack problem.

UNIT V **9**

Graph Traversals – Connected Components – Spanning Trees – Biconnected components – Branch and Bound: General Methods (FIFO & LC) – 0/1 Knapsack Problem – Introduction to NP-Hard and NP-Completeness.

TUTORIAL = 15

Total = 45

TEXT BOOK:

1. Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, Computer Algorithms/ C++, Second Edition, Universities Press, 2007. (For Units II to V)

2. K.S. Easwarakumar, Object Oriented Data Structures using C++, Vikas Publishing House pvt. Ltd., 2000 (For Unit I)

REFERENCES:

1. T. H. Cormen, C. E. Leiserson, R.L.Rivest, and C. Stein, "Introduction to Algorithms", Second Edition, Prentice Hall of India Pvt. Ltd, 2003.
2. Alfred V. Aho, John E. Hopcroft and Jeffrey D. Ullman, "The Design and Analysis of Computer Algorithms", Pearson Education, 1999.

USER INTERFACE DESIGN
(Common for CSSE, CSE)

L	P	T	C
3	0	0	3

AIM:

To understand that User Interface Design is as important as Functionality Design to study the basic principles User-Centered Design

OBJECTIVES:

1. To study the basic characteristics of graphics and web interfaces
2. To study the basics of Human Computer Interaction
3. To study the basics of WIMP interfaces
4. To study the multimedia interfaces for the web
5. 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 : 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.

TOTAL QUALITY MANAGEMENT

(Common for CSE, MECH, AUTO, BIOINFO, BIOTECH, CIVIL, IT, EEE, AERO)

L	P	T	C
3	0	0	3

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.

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.

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.

3. STATISTICAL PROCESS CONTROL (SPC)

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.

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.

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: 45

TEXT BOOK

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.

PARALLEL COMPUTING

L	P	T	C
3	0	0	3

Aim

To understand concepts, algorithms, and design principles of parallel computing

Objective:

Students will demonstrate an understanding of concepts, algorithms, and design principles underlying parallel computing, develop algorithm design and implementation skills, and gain practical experience in programming large scale parallel machines

OUTCOMES:

1. An ability to apply knowledge of computing, mathematics, science, and engineering.
2. An ability to design and conduct experiments, as well as to analyze and interpret data.
3. An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs, within realistic constraints specific to the field.
4. An ability to function effectively on multi-disciplinary teams.
5. An ability to analyze a problem, and identify, formulate and use the appropriate computing and engineering requirements for obtaining its solution.

UNIT I SCALABILITY AND CLUSTERING 9

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

UNIT II ENABLING TECHNOLOGIES 9

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

UNIT III SYSTEM INTERCONNECTS 9

Basics of Interconnection Networks – Network Topologies and Properties – Buses, Crossbar and Multistage Switches, Software Multithreading – Synchronization Mechanisms.

UNIT IV PARALLEL PROGRAMMING 9

Paradigms And Programmability – Parallel Programming Models – Shared Memory Programming.

UNIT V MESSAGE PASSING PROGRAMMING 9

Message Passing Paradigm – Message Passing Interface – Parallel Virtual Machine.

TOTAL : 45

TEXT BOOK

1. Kai Hwang and Zhi.Wei Xu, “Scalable Parallel Computing”, Tata McGraw-Hill, New Delhi, 2003.

REFERENCES

1. David E. Culler & Jaswinder Pal Singh, "Parallel Computing Architecture: A Hardware/Software Approach", Morgan Kaufman Publishers, 1999.
2. Michael J. Quinn, "Parallel Programming in C with MPI & OpenMP", Tata McGraw-Hill, New Delhi, 2003.
3. Kai Hwang, "Advanced Computer Architecture" Tata McGraw-Hill, New Delhi, 2003.

HIGH SPEED NETWORKS
(COMMON FOE ECE, CSE)

L	P	T	C
3	0	0	3

AIM:

To provide an understanding of the networking standards that can be adopted with the current day requirements of complex and voluminous content transfer over heterogeneous platforms.

OBJECTIVES:

- To know about the various standards adopted for handling high traffic.
- To have a primitive level performance analysis for few network constraints for various amount traffic with different networking standards.
- To get a feel of designing a High speed network setup with specialized hardware and optimization approaches like parallelism and pipelining.

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 **8**

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 **11**

TCP Flow control – TCP Congestion Control – Retransmission – Timer Management – Exponential RTO back off – KARN's Algorithm – Window management – Performance of TCP over ATM. Traffic and Congestion control in ATM – Requirements – Attributes Traffic Management 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 **8**

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

UNIT V PROTOCOLS FOR QOS SUPPORT **9**

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

TOTAL= 45 PERIODS

TEXT BOOK

1. William Stallings, “High Speed Networks and Interne”, Pearson Education, Second Edition, 2002.

REFERENCES

1. Warland, Pravin Varaiya, “High performance communication networks”, Second Edition, Jean Harcourt Asia Pvt. Ltd., 2001.

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

3. Abhijit S. Pandya, Ercan Sea, “ATM Technology for Broad Band Telecommunication Networks”, CRC Press, New York, 2004.

DIGITAL IMAGE PROCESSING

(COMMON FOR ECE, BME, MECHAT, EIE, CSE, IT)

L	P	T	C
3	0	0	3

AIM:

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

OBJECTIVES:

- To introduce basic concepts in acquiring, storage and 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

ROBOTICS
(COMMON FOR ECE, ETCE.CSE & BME)

L	P	T	C
3	0	0	3

Aim

To understand the concepts, algorithms, and design principles of Robotics field

COURSE OBJECTIVES

- To acquire the knowledge on advanced algebraic tools for the description of motion.
- To develop the ability to analyze and design the motion for articulated systems.
- To develop an ability to use software tools for analysis and design of robotics systems
- To provide the student with knowledge of the singularity issues associated with the operation of robotics systems.
- To acquire the knowledge and skills associated with robot control

OUTCOMES

CO1 : Ability to apply spatial transformation to obtain forward kinematics equation of robot manipulators.
CO2: Understand, apply and document the engineering design process.
CO3: Able to create, and interpret fundamental programming of robots and automated systems.
CO4: Identify and use variables in programming and also utilize a personal library of commands
CO5: Ability to identify and report on educational pathways and carrer apportunities in robotics and automation

1. ROBOT ORGANIZATION **9**

Coordinate transformation, kinematics and inverse kinematics. Trajectory planning and remote manipulation.

2. ROBOT HARDWARE **9**

Robot sensors. Proximity sensors. Range sensors. Visual sensors. Auditory sensors. Robot manipulators. Manipulator dynamics. Manipulator control. Wrists. End efforts. Robot grippers.

3. ROBOT AND ARTIFICIAL INTELLIGENCE **9**

Principles of AI. Basics of learning. Planning movement. Basics of knowledge representations, Robot programming languages.

4. ROBOTIC VISION SYSTEMS **9**

Principles of edge detection. Determining optical flow and shape. Image segmentation. Pattern recognition. Model directed scene analysis.

5. ROBOT CONTROL AND APPLICATION **9**

Robot control using voice and infrared. Overview of robot applications. Prosthetic devices. Robots in material handling, processing assembly and storage.

TOTAL HOURS: 45

REFERENCE BOOKS:

1. Koren,: "Robotics for Engineers", McGraw Hill International Company, Tokyo, 1995.
2. Vokopravotic, "Introduction to Robotics", Springer, 1988.
3. Rathmill K., "Robot Technology and Application", Springer, 1985.
4. Charniak and McDarmott, "Introduction to Artificial Intelligence", McGraw Hill, 1986.
5. K.S. Fu, R.C. Gonzally, C.S.G. Lee, "Robotics Control, Sensing, Vision and Intelligence", McGraw Hill Book Company, 1997.
6. Barry Leatham, Jones, "Elements of Industrial Robotics", Pittman Publishing, 1987.
7. Mikell P. Groover, Mitchell Weiss, Roger. N, Nagel, Nicholas G. Odrey, "Industrial Robotic Technology Programming and Applications", McGraw Hill Book Company, 1986

8. Bernard Hodges and Paul Hallam, “Industrial Robotics ", British Library Cataloguing Publication, 1990.

SOFTWARE QUALITY MANAGEMENT

L P T C
3 0 0 3

AIM:

To understand the principles of software development emphasizing processes and activities of quality assurance.

OBJECTIVES:

1. Defining quality assurance plans
2. Applying quality assurance tools & techniques

OUTCOMES

Learn the needs of software quality
Understand the factors affecting the SQA and requirement for SQA
Acquire knowledge of quality and the nature of software defects
Apply the quality tools and establish the steps for planning the quality
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 : 45

TEXT BOOKS

Allan C. Gillies, "Software Quality: Theory and Management", Thomson Learning, 2003. (UI : Ch 1-4 ; UV : Ch 7-8)

Stephen H. Kan, "Metrics and Models in Software Quality Engineering", Pearson Education (Singapore) Pte Ltd., 2002. (UI : Ch 3-4; UIII : Ch 5-8 ; UIV : Ch 9-11)

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".

QUANTUM COMPUTING

L P T C
3 0 0 3

AIM : To learn quantum computing concepts, computation

OBJECTIVES

Computers get smaller and smaller; limitations in the hardware restrict our ability to build faster and faster solid state computers. Quantum computers are an attempt to design more powerful computers using the principles of quantum mechanics. Quantum computers rely on quantum entanglement and quantum parallelism for their speed, unavailable under classical computation.

OUTCOMES

CO1: Design of quantum computers using quantum bits (qubits), quantum gates and quantum circuits.
CO2: Implementation of basic quantum algorithms, including Deutsch's algorithm, Shor's factoring algorithm, and the search algorithm of Grover.
CO3: Understand the quantum Fourier transform and quantum searching.
CO4: Ability to design Quantum search for structured database
CO5: Understand the trends in Quantum Computing such as Optical Photon Computers, Optical Cavity Quantum electrodynamics.

.UNIT I FUNDAMENTAL CONCEPTS 9

Global Perspectives, Quantum Bits, Quantum Computation, Quantum Algorithms, Quantum Information, Postulates of Quantum Mechanisms.

UNIT II QUANTUM COMPUTATION 9

Quantum Circuits – Quantum algorithms, Single Orbit operations, Control Operations, Measurement, Universal Quantum Gates, Simulation of Quantum Systems, Quantum Fourier transform, Phase estimation, Applications, Quantum search algorithms – Quantum counting – Speeding up the solution of NP – complete problems – Quantum Search for an unstructured database.

UNIT III QUANTUM COMPUTERS 9

Guiding Principles, Conditions for Quantum Computation, Harmonic Oscillator Quantum Computer, Optical Photon Quantum Computer – Optical cavity Quantum electrodynamics, Ion traps, Nuclear Magnetic resonance.

UNIT IV QUANTUM INFORMATIONS 9

Quantum noise and Quantum Operations – Classical Noise and Markov Processes, Quantum Operations, Examples of Quantum noise and Quantum Operations – Applications of Quantum operations, Limitations of the Quantum operations formalism, Distance Measures for Quantum information.

UNIT V QUANTUM ERROR CORRECTION 9

Introduction, Shor code, Theory of Quantum Error –Correction, Constructing Quantum Codes, Stabilizer codes, Fault – Tolerant Quantum Computation, Entropy and information – Shannon Entropy, Basic properties of Entropy, Von Neumann, Strong Sub Additivity, Data Compression, Entanglement as a physical resource.

TOTAL : 45

TEXT BOOK

Micheal A. Nielsen. & Issac L. Chiang, "Quantum Computation and Quantum Information", Cambridge University Press, Fint South Asian edition, 2002.

KNOWLEDGE BASED DECISION SUPPORT SYSTEM

L P T C
3 0 0 3

AIM:

To understand the knowledge based decision support system

OBJECTIVES:

- To familiarize decision support systems and their characteristics
- To learn the technologies related to decision support systems
- To study about Intelligent DSS and applications of DSS

OUTCOMES:

- Management Support systems
- Business Intelligence
- Collaborative computing technologies
- Intelligent decision support system

UNIT I INTRODUCTION 9

Decision making, Systems, Modeling, and support – Introduction and Definition – Systems – Models – Modeling process – Decision making: The intelligence phase – The design phase - The choice phase – Evaluation: The implementation phase –Alternative Decision – Making models – Decision support systems – Decision makers - Case applications.

UNIT II DECISION SUPPORT SYSTEM DEVELOPMENT 9

Decision Support System Development**:** Introduction - Life cycle – Methodologies – prototype – Technology Levels and Tools – Development platforms – Tool selection – Developing DSS
Enterprise systems: Concepts and Definition – Evolution of information systems – Information needs – Characteristics and capabilities – Comparing and Integrating EIS and DSS – EIS data access, Data Warehouse, OLAP, Multidimensional analysis, Presentation and the web – Including soft information enterprise on systems - Organizational DSS – supply and value chains and decision support – supply chain problems and solutions – computerized systems MRP, ERP, SCM – frontline decision support systems.

UNIT III KNOWLEDGE MANAGEMENT 9

Introduction – Organizational learning and memory – Knowledge management –Development –methods, Technologies, and Tools – success –Knowledge management and Artificial intelligence – Electronic document management.

Knowledge acquisition and validation: Knowledge engineering – Scope – Acquisition methods - Interviews – Tracking methods – Observation and other methods – Grid analysis – Machine Learning: Rule induction, case-based reasoning – Neural computing – Intelligent agents – Selection of an appropriate knowledge acquisition methods – Multiple experts – Validation and verification of the knowledge base – Analysis, coding, documenting, and diagramming – Numeric and documented knowledge acquisition – Knowledge acquisition and the Internet/Intranets.

Knowledge representation: Introduction – Representation in logic and other schemas – Semantic networks – Production rules – Frames – Multiple knowledge representation – Experimental knowledge representations - Representing uncertainty.

UNIT IV INTELLIGENT SYSTEM DEVELOPMENT 9

Inference Techniques: Reasoning in artificial intelligence – Inference with rules: The Inference tree – Inference with frames – Model-based and case-based reasoning - Explanation and Meta knowledge – Inference with uncertainty – Representing uncertainty – Probabilities and related approaches – Theory of certainty – Approximate reasoning using fuzzy logic.

Intelligent Systems Development: Prototyping: Project Initialization – System analysis and design – Software classification: Building expert systems with tools – Shells and environments – Software selection – Hardware – Rapid prototyping and a demonstration prototype - System development –Implementation – Post implementation.

UNIT V MANAGEMENT SUPPORT SYSTEMS 9

Implementing and integrating management support systems – Implementation: The major issues - Strategies – System integration – Generic models MSS, DSS, ES – Integrating EIS, DSS and ES, and global integration – Intelligent DSS – Intelligent modeling and model management – Examples of integrated systems – Problems and issues in integration.

Impacts of Management Support Systems – Introduction – overview – Organizational structure and related areas – MSS support to business process reengineering – Personnel management issues – Impact on individuals – Productivity, quality, and competitiveness – decision making and the manager manager's job – Issues of legality, privacy, and ethics – Intelligent systems and employment levels – Internet communication – other societal impacts – managerial implications and social responsibilities –

TOTAL : 45

TEXT BOOK

Efrain Turban, Jay E.Aronson, "Decision Support Systems and Intelligent Systems" 6th Edition, Pearson Education, 2001.

REFERENCES

Ganesh Natarajan, Sandhya Shekhar, "Knowledge management – Enabling Business Growth", Tata McGraw-Hill, 2002.

George M.Marakas, "Decision Support System", Prentice Hall, India, 2003.

Efrem A.Mallach, "Decision Support and Data Warehouse Systems", Tata McGraw-Hill, 2002.

CLOUD COMPUTING

L P T 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.

COURSE OUTCOMES

CO1: Understand the layers and types of Cloud Computing
CO2: Understand the IaaS, PaaS and SaaS
CO3: Analyze various scheduling techniques for virtual machines in cloud infrastructure
CO4: Implement private/public/hybrid Cloud infrastructure
CO5: Implement policy management system for Cloud Computing
CO6: 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.

REFERENCE BOOK

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

VISUAL PROGRAMMING
(Common to CSE/CSSE/IT)

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3	0	0	3

AIM:

To introduce windows programming and to cover visual C++ in detail.

OBJECTIVES:

1. To introduce event driven programming
2. To develop and display a window
3. To illustrate the working of message loop

OUTCOMES:

Design Webpage using Visual Basic Controls with Data base Connectivity ODBC and DAO.
Identify the recourses for drawing, painting and sorting without using MFC
Analyze and Evaluate the concepts of windows programming using MFC (VC++) and Active X
Apply the general idea about the different Active X Controls and Dialog boxes.
Evaluate ODBC and DAO database connectivity‘s for webpage design using VC++

UNIT I WINDOWS PROGRAMMING 9

Windows environment – a simple windows program – windows and messages – creating the window – displaying the window – message loop – the window procedure – message processing – text output – painting and repainting – introduction to GDI – device context – basic drawing – child window controls

UNIT II VISUAL C++ PROGRAMMING – INTRODUCTION 9

Application Framework – MFC library – Visual C++ Components – Event Handling – Mapping modes – colors – fonts – modal and modeless dialog – windows common controls – bitmaps

UNIT III THE DOCUMENT AND VIEW ARCHITECTURE 9

Menus – Keyboard accelerators – rich edit control – toolbars – status bars – reusable frame window base class – separating document from its view – reading and writing SDI and MDI documents – splitter window and multiple views – creating DLLs – dialog based applications

UNIT IV ACTIVEX AND OBJECT LINKING AND EMBEDDING (OLE) 9

ActiveX controls Vs. Ordinary Windows Controls – Installing ActiveX controls – Calendar Control – ActiveX control container programming – create ActiveX control at runtime – Component Object Model (COM) – containment and aggregation Vs. inheritance – OLE drag and drop – OLE embedded component and containers – sample applications

UNIT V ADVANCED CONCEPTS 9

Database Management with Microsoft ODBC – Structured Query Language – MFC ODBC classes – sample database applications – filter and sort strings – DAO concepts – displaying database records in scrolling view – Threading – VC++ Networking issues – Winsock – WinInet – building a web client – Internet Information Server – ISAPI server extension – chat application – playing and multimedia (sound and video) files

TOTAL : 45

TEXT BOOKS

1. Charles Petzold, “Windows Programming”, Microsoft press, 1996 (Unit I – Chapter 1-9)
2. David J.Kruglinski, George Shepherd and Scot Wingo, “Programming Visual C++”, Microsoft press, 1999 (Unit II – V)

REFERENCE

1. Steve Holtzner, “Visual C++ 6 Programming”, Wiley Dreamtech India Pvt. Ltd., 2003.