

## COMPUTER SCIENCE AND ENGINEERING

### I SEMESTER :

COURSE CODE	THEORY/LAB	L	T	P	C
ABM1101	Mathematics-I	4	1	0	4
ABP1101	Physics	4	1	0	4
ABC1101	Chemistry	4	0	0	4
AME1103	Engineering Mechanics	4	1	0	4
AEE1136	Basic Electrical Engineering	4	1	0	4
ABP1102	<i>Physics and Chemistry Lab</i>	0	0	3	2
AME1102	<i>Engineering Drawing</i>	0	0	3	2
ACT1101	<i>PC Software Lab</i>	0	0	3	2
	<b>Total</b>	<b>20</b>	<b>4</b>	<b>9</b>	<b>26</b>

### II SEMESTER :

COURSE CODE	THEORY/LAB	L	T	P	C
AHE1101	English	4	0	0	4
ABM1102	Mathematics-II	4	1	0	4
ABM1103	Probability, Statistics and numerical Methods	4	1	0	4
ABE1101	Environmental Studies	4	0	0	4
ACT1102	Computer programming through C	4	1	0	4
AHE1102	<i>English Language lab.</i>	0	0	3	2
AMT1101	<i>Engineering Workshop</i>	0	0	3	2
ACT1103	<i>Computer programming Lab</i>	0	0	3	2
	<b>Total</b>	<b>20</b>	<b>3</b>	<b>9</b>	<b>26</b>

## III SEMESTER :

COURSE CODE	THEORY/LAB	L	T	P	C
ABM1106	Discrete Mathematical Structures	4	1	0	4
ACT1104	Computer Organization	4	1	0	4
AEC1142	Digital Logic Design	4	0	0	4
AEC1143	Electronic Devices and circuits	4	1	0	4
AHM1101	Managerial Economics and Financial Analysis	4	0	0	4
ACT1105	Data structures using C++	4	1	0	4
AEC1144	<i>Analog &amp; Digital Circuits Lab</i>	0	0	3	2
ACT1106	<i>Data structures Lab</i>	0	0	3	2
	<b>Total</b>	<b>24</b>	<b>4</b>	<b>6</b>	<b>28</b>

## IV SEMESTER :

COURSE CODE	THEORY/LAB	L	T	P	C
ACT1107	Unix & Shell Programming	4	0	0	4
ACT1108	Operating Systems	4	1	0	4
ACT1109	Database Management Systems	4	1	0	4
ACT1110	Object Oriented Programming through Java	4	1	0	4
ACS1101	Principles of Programming Languages	4	0	0	4
ACT1130	Computer Networks	4	1	0	4
ACT1111	<i>Operating System Lab</i>	0	0	3	2
ACT1112	<i>Database Management Systems lab</i>	0	0	3	2
	<b>Total</b>	<b>24</b>	<b>4</b>	<b>6</b>	<b>28</b>

## V SEMESTER :

COURSE CODE	THEORY/LAB	L	T	P	C
ACT1113	Computer Graphics	4	0	0	4
ACT1114	Formal languages and Automata Theory	4	1	0	4
ACT1131	Artificial Intelligence	4	0	0	4
ACT1115	Microprocessors and Interfacing	4	1	0	4
ACT1116	Design and Analysis of Algorithms	4	1	0	4
ACT1117	Software Engineering	4	1	0	4
ACT1118	Microprocessors and Interfacing lab	0	0	3	2
AHE1103	Advanced communication skills lab	0	0	3	2
	<b>Total</b>	<b>24</b>	<b>4</b>	<b>6</b>	<b>28</b>

## VI SEMESTER :

COURSE CODE	THEORY/LAB	L	T	P	C
ACT1119	Software Testing Methodologies	4	1	0	4
AHM1102	Management Science	4	0	0	4
ACS1102	Network Security and Cryptography	4	1	0	4
ACT1134	Web Programming	4	1	0	4
ACS1103	Compiler Design	4	1	0	4
ACT1120	Object Oriented Analysis and Design	4	0	0	4
ACS1104	Web Programming and UML lab	0	0	3	2
ACS1105	Network Security and Cryptography Lab	0	0	3	2
	<b>Total</b>	<b>24</b>	<b>4</b>	<b>6</b>	<b>28</b>

## VII SEMESTER :

COURSE CODE	THEORY/LAB	L	T	P	C
ACT1121	Embedded Systems	4	1	0	4
ACT1122	Multimedia and Application Development	4	0	0	4
ACS1106	Computer Architecture	4	1	0	4
ACS1114	Principles of Data Warehousing and Data mining	4	1	0	4
	Elective-I	4	1	0	4
ACS1107	Natural Language Processing				
ACT1124	Unix Network Programming				
ACT1133	Bio-Informatics				
ACT1135	Information Storage Systems				
AEE1140	Electrical Safety Management				
AME1135	Non-Conventional Sources of Energy				
	Elective-II	4	1	0	4
ACT1125	Information Retrieval Systems				

ACS1108	Client-Server Computing				
ACT1126	Software Project Management				
ACT1136	Digital Forensics				
AEC1132	Satellite Communication				
ACE1152	Architectural Planning of Buildings				
ACS1109	Embedded Systems lab	0	0	3	2
ACS1110	Data mining and Data Warehousing lab	0	0	3	2
ACS11MP	* Industry Oriented Mini-project	-	-	-	2
	<b>Total</b>	<b>24</b>	<b>5</b>	<b>6</b>	<b>30</b>

### VIII SEMESTER :

<b>COURSE CODE</b>	<b>THEORY/LAB</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
ACS1111	Human Computer Interaction	4	0	0	4
	Elective-III	4	1	0	4
ACT1127	Network Management Systems				
ACS1112	Artificial Neural Networks				
ACT1128	Image Processing				
ACT1137	Multi-Core Programming				
ACE1153	Green Buildings & Infrastructure				
	Elective-IV	4	1	0	4
ACT1129	Pattern Recognition				
ACT1132	Mobile Communications				
ACS1113	Virtual Reality				
ACT1138	Information Storage Security and Management				
ACH1148	Optimization Techniques				
ACS11SM	Seminar	0	0	3	2
ACS11CV	Comprehensive Viva	0	0	0	4
ACS11PW	Project Work	0	0	9	12
	<b>Total</b>	<b>12</b>	<b>2</b>	<b>12</b>	<b>30</b>

---

---

***SYLLABI FOR I SEMESTER***

---

---



## MATHEMATICS – I

(Common to all Branches)

**Course Code : ABM1101**

L	T	P	C
4	1	0	4

### AIM :

To impart the necessary fundamental principles that are essential to study the core courses of Engineering.

### OBJECTIVE :

To motivate and inculcate the logical thinking and methodical approach to solve mathematical problems

### UNIT - I

Sequences – Series – Convergence and divergence – Comparison test – Ratio test – Integral test – Alternating series, Leibniz's test  
(9.1 to 9.9, 9.12).

Rolle's theorem – Lagrange's Mean Value Theorem – Cauchy's mean value Theorem – Taylor's theorem and Maclaurin's series (all theorems without proof)  
(4.3, 4.4).

### UNIT - II

Differential equations of first order (linear, Bernoulli), Linear differential equations with constant coefficients, Method of Variation of parameters .  
(11.9, 11.10, 13.1, 13.3-13.8(i), 13.9)

### UNIT - III

Applications of Linear differential equations: orthogonal trajectories, Newton's law of cooling, Simple harmonic motion, Oscillatory electrical circuits (LC and LCR circuits).  
(12.3, 12.6, 14.2, 14.5)

### UNIT - IV

Laplace transform of elementary functions, properties, Transforms of derivatives and integrals – Unit step function – second shifting theorem, Periodic function. (21.1-21.5, 21.7-21.11)

## UNIT - V

Inverse transform — Inverse transform of Derivatives and Integrals - Convolution theorem – Application of Laplace transforms to ordinary differential equations, Unit step function, Unit impulse function.

(21.12-21.15, 21.17, 21.18)

## UNIT - VI

Partial differentiation: Total derivative, change of variables, Jacobians, Taylor's theorem for functions of two variables, maxima and minima of functions of two variables.

(5.5 – 5.9, 5.11)

## UNIT - VII

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions – solutions of first order linear (Lagrange) equation and nonlinear first order (standard type) equations.

(17.1 to 17.3, 17.5, 17.6)

## UNIT - VIII

Method of separation of variables – Classification of second order linear Partial Differential Equations, solutions of one dimensional heat equation, wave equation and two-dimensional Laplace's equation under initial and boundary conditions.

( 18.1 to 18.7)

## TEXT BOOK :

Dr.B.S.Grewal “Higher Engineering Mathematics”, 40<sup>th</sup> Edition, Khanna Publishers

## REFERENCES :

1. Kreyszig E, “Advanced Engineering Mathematics”, 8<sup>th</sup> Ed. John Wiley, Singapore (2001)
2. Greenberg M D, “Advanced Engineering Mathematics”, 2nd Ed, Pearson Education, Singapore, Indian Print (2003).





## PHYSICS

**Course Code : ABP1101**

L	T	P	C
4	1	0	4

### AIM :

To give prerequisites in understanding the advanced Physics leading to applications in engineering field.

### OBJECTIVE :

To impart the students the concept and principles in Engineering to enable them to comprehend and take up the experimental work independently.

### UNIT - I

#### VIBRATIONS & ACOUSTICS OF BUILDINGS :

- i) Overview of vibrations with emphasis on damped and forced oscillations- resonance, coupled oscillators - two coupled pendulums and normal mode solutions.

(Engineering Physics - Gaur & Gupta Chap - 33, and Unified Physics, Vol-1, S L Gupta & Sanjeev Gupta, Chap-11 (coupled oscillators)

- ii) Reverberation and Reverberation time – Sabine’s formula for reverberation time – measurement of absorption coefficient of material- Basic requirements of acoustically good hall -Factors affecting the architectural acoustics and their remedies.

(Engineering Physics - Gaur & Gupta Chap - 14)

### UNIT – II

#### PHYSICAL OPTICS :

Interference: Superposition of waves, Young’s double slit experiment, Interference in thin films by reflection, Newton’s rings experiment with necessary theory.

Diffraction: Fresnel and Fraunhofer diffraction, Diffraction at single slit and diffraction grating, determination of wavelengths of various spectral lines, resolving power of grating.

Polarization: Types of Polarizations, Brewster's law, Double refraction, Nicol Prism, Polaroid's.

(Engineering Physics - Gaur & Gupta Chap - 26, 27, 28 & 29)

### UNIT – III

#### CRYSTAL PHYSICS & SUPERCONDUCTIVITY :

i) Crystal Physics : Space lattice, basis and crystal structure, Unit cell, primitive cell, Seven crystal systems, Bravais lattices- SC, BCC, FCC crystal structures- crystal planes and Directions- Miller indices, Derivation of inter planar spacing.

(Applied Physics for Engineers - P K Palanisamy Chap - 2)

ii) Superconductivity: superconducting phenomenon, Meissner effect, Type I & Type II Super conductors, BCS theory, DC and AC Josephson effects, SQUIDS, High Temperature Super conductors- Applications.

(Applied Physics for Engineers - P K Palanisamy Chap - 9)

### UNIT – IV

#### QUANTUM MECHANICS :

Dual nature of matter, DeBroglie wave length, Time independent Schrödinger wave equation, Physical significance of wave function, particle in a potential well, rigid and non rigid walls, Tunneling effect

(Applied Physics for Engineers - P K Palanisamy Chap - 3)

### UNIT – V

#### FREE ELECTRON THEORY :

Introduction, Quantum free electron theory, Fermi-Dirac distribution and its dependence on temperature, Fermi energy, Electron scattering and resistance, motion of an electron in periodic potential, Kronig-Penney model (qualitative treatment), effective mass; classification of solids.

(Applied Physics for Engineers - P K Palanisamy Chap - 4 & 5)

### UNIT – VI

#### DIELECTRICS :

Basic definitions, relation between  $\mathbf{P}$ ,  $\mathbf{D}$  and  $\mathbf{E}$  vectors, Polarization

mechanisms, expression for electronic polarizability, Internal fields in solids, Clausius-Mosotti equation, frequency and temperature dependence of electronic polarization, Dielectric strength, Dielectric loss, Loss tangent and Dielectric breakdown, Applications.

(Applied Physics for Engineers - P K Palanisamy Chap - 6)

## **UNIT – VII**

### **LASERS AND FIBER OPTICS :**

i) Introduction, Characteristics of lasers, Induced absorption, spontaneous and stimulated emission of radiation, Population Inversion, Einstein's coefficients, Low and high power Lasers, Ruby laser, He-Ne laser, CO<sub>2</sub> and semiconductor laser, Applications of lasers.

(Applied Physics for Engineers - P K Palanisamy Chap - 10)

ii) Basic principle of propagation of light in optical fibers, Numerical aperture, acceptance angle, Derivation of Numerical aperture, Classification of optical fibers on the basis of refractive index profile, Fiber optic communication system, Applications.

(Applied Physics for Engineers - P K Palanisamy Chap - 2)

## **UNIT – VIII**

### **FUNCTIONAL MATERIALS :**

i) Bio materials, SMART materials, metallic glasses, metal matrix composites, Electrets – piezo and ferro electric materials.

(Engineering Physics by V Rajendran, Chap - 21, 24, 25, materials Science - M Armugam - Metal Matrix composites and Electrets, SMART Materials chap -11)

ii) Nanophase materials: Introduction to nano materials, types of nano materials, Fabrication Techniques: ball milling, nano lithography, CVD, carbon nano tubes (CNT's), Applications.

(Engineering Physics M R Srinivasan, Chap - 15)

**TEXT BOOKS :**

1. R.K. Gaur and S.L.Gupta, “Engineering Physics”, 8<sup>th</sup> Edition, Dhanpaat Rai, 2003.
2. P.K. Palanisamy, “Applied Physics”, 2<sup>nd</sup> Edition, Scitech Publishers, 2010.
3. M.R. Srinivasan, “Engineering Physics”, 1<sup>st</sup> Edition, New Age Publishers, 2009.
4. V. Rajendran, “Engineering Physics”, TMH, 2009.

**REFERENCES :**

1. C.Kittel, “Introduction to Solid State Physics”, 7<sup>th</sup> Edition, John Wiley, 2007.
2. M Ross, Lawrence, Shepard, J Wulff , “Structure and properties of Materials, (Volume-4, Electronic properties)”, Wiley East Publishers, 2004.
3. Avadhanulu & Kshirasagar, “Engineering Physics”, 9<sup>th</sup> Edition, S. Chand Publishers, 2008.
4. S.O. Pillai, “Solid State Physics”, New Age Publishers, 2004.
5. Sulabh. K. Kulkarni, “Nano Technology - Principles and Practices”, 2006.
6. V.Raghavan, “Material Science”, 5<sup>th</sup> Edition, PHI, 2007.
7. R.L.Singhal, “Solid State Physics”, 6<sup>th</sup> Edition, Kedarnadh, Ramnadh Publishers, 2003.
8. A. Beiser., “Perspectives in Modern Physics”, 5<sup>th</sup> Edition, McGraw Hill Publishers, 2006.
9. A.J. Dekker, “Electrical Engineering Materials”, 1<sup>st</sup> Edition, Mac Millan, 2007.
10. M. Armugam, “Material Science”, 3<sup>rd</sup> Edition, Anuradha Publishers, 2009.
11. S.L. Gupta, & Sanjeev Gupta, “Unified Physics”, Vol - 1, 16<sup>th</sup> Edition, Jaiprakash Nath & Co., 2007.



## CHEMISTRY

**Course Code : ABC1101**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>1</b>	<b>0</b>	<b>4</b>

### AIM :

The aim of the course is to provide basic chemistry background required for under graduate students of engineering.

### OBJECTIVE :

The Objective of the course is to provide an over view of chemical properties of materials which the engineers are likely to use during their professional careers.

### UNIT - I

**ELECTROMOTIVE FORCE :** Electrode potential, Nernst equation, EMF of electro chemical cell, calculation of cell potential, concentration cell, determination of  $P^H$  of solution.

**BATTERIES** - primary cell-Dry or Lachanche cell, alkaline battery; secondary cells (storage batteries or accumulators) – Lead-acid Accumulator, Nickel-cadmium battery.and lithium ion battery.

**Fuel cells** - hydrogen, oxygen fuel cell, phosphoric acid fuel cell, solid oxide fuel cells.

### UNIT - II

**CORROSION AND ITS CONTROL :** Introduction-Dry or chemical corrosion, Wet or Electrochemical corrosion-Hydrogen evolution type, oxygen absorption type, Galvanic corrosion and concentration cell corrosion, pitting, waterline, and stress corrosion; passivity; Galvanic series; factors influencing corrosion. Corrosion control-proper designing, cathodic protection, modifying the environment and using inhibitors. Protective coatings- anodic and cathodic coatings; Hot dipping-Galvanizing and Tinning, Metal cladding; Electroplating; Electro less plating; cementation or diffusion coatings.

## UNIT - III

### CHEMICAL KINETICS

Arrhenius theory-effect of temperature on reaction rates –concept of activated complex; collision theory of reaction rates; Lindeman's theory of unimolecular reactions, steady state approximation; Transition state theory.

## UNIT - IV

### BONDING IN COORDINATION COMPOUNDS

Valence bond theory- limitations, crystal field theory, ligand field theory-octahedral and tetrahedral complexes. Spectral properties of  $d^1$  ions & magnetic properties of low spin and high spin complexes. Molecular orbital theory as applied to octahedral complexes not involving pi-bonding.

## UNIT - V

### PRINCIPLES AND MECHANISMS OF ORGANIC REACTIONS

Bond fission – homolysis and heterolysis-examples. Types of reagents-electrophilic and nucleophilic reagents -examples. Concept of aromaticity, Huckel's  $(4n+2)$  rule. Introduction to mechanistic aspect of electrophilic aromatic substitution- nitration, sulphonation. Friedel-Crafts alkylation and acylation.

## UNIT - VI

### POLYMER SCIENCE AND TECHNOLOGY

Nomenclature; Types of polymerization, Mechanism of addition and condensation polymerization, Effect of polymer structure on properties. Plastics- Thermo and thermosetting plastics, constituents of a plastic. Preparation, properties and uses of polythene, PVC, Teflon, nylons-6,6, bakelite and silicones.

**RUBBER** - Natural rubber-structure-vulcanization, compounding of rubber; synthetic rubbers-Buna-Sand Buna-N.

## UNIT - VII

### SEMI CONDUCTING MATERIALS

Band theory of solids, Types-Intrinsic, extrinsic, (n-type, p-type,) non-elemental semi conducting materials- stoichiometric semi conducting compounds, defect semiconductors, controlled valency semiconductors. Preparation of semiconductors- Zone refining, Czochralski crystal pulling technique, Doping technique.

## UNIT - VIII

### CHEMISTRY OF ENGINEERING MATERIALS

**Cement** - classification; Portland cement- raw materials, manufacture of Portland cement, chemical constitution of Portland cement, setting and hardening of Portland cement.

**REFRACTORIES** - Classification and properties of refractories

**FUELS** - classification; calorific value and its determination using Bomb and Junker's gas calorimeter, theoretical calculation of calorific value-Proximate and ultimate analysis of coal; Refining of petroleum-, catalytic cracking; catalytic reforming, knocking, octane rating, improvement in anti knock characteristics, unleaded petrol; diesel engine fuels, cetane value

**LUBRICANTS** - Friction- mechanism of lubrication-Fluid film lubrication; thin or boundary lubrication and extreme pressure lubrication, classification-Lubricating oils, greases and solid lubricants.

#### TEXT BOOKS :

1. Jain & Jain, "A Text Book of Engineering Chemistry", Dhanapat Roy Publishing Company, 15<sup>th</sup> Edition, 2006.
2. Shiva Shankar, "Engineering Chemistry", Tata Mc Graw Hill, 2008.

#### REFERENCES :

1. Sashi chawala, "Engineering Chemistry", Dhanpath Rai Publications, 3<sup>rd</sup> Edition, 2010.
2. C. Parameswara Murthy, C.V. Agarwal and Andhra Naidu, "A Text Book of Engineering Chemistry", B.S. Publications, 1<sup>st</sup> Edition, 2006.
3. J.D.Lee, "Concise Inorganic Chemistry", Black Well Science Publications, 5<sup>th</sup> Edition, 2005.
4. Arun Bahl & B.S.Bahl, "Advanced Organic Chemistry", S.Chand Publications, 2010.
5. Gurudeep Raj, "Physical Chemistry", Goel Publications, 3<sup>rd</sup> Edition, 2007.
6. S.S. Dara, "Text book of Engineering Chemistry", S. Chand Publications, 11<sup>th</sup> Edition, 2006.



## ENGINEERING MECHANICS

**Course Code : AME1103**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>1</b>	<b>0</b>	<b>4</b>

### AIM & OBJECTIVES :

1. To develop logical thinking approach to engineering problems.
2. Calculation and estimation of forces developed in various engineering structures.

### UNIT - I

**SYSTEMS OF FORCES :** Introduction – parallelogram law – Forces and components - Resultant of coplanar concurrent forces - component forces in space - vector notation – moment of force – principle of moments – couples. Resultant of planar force systems and spatial concurrent force system.

### UNIT - II

**EQUILIBRIUM OF FORCE SYSTEMS :** Equilibrium – free body diagrams – Equations of equilibrium – equilibrium of planar systems – graphical methods and analytical methods for equilibrium of planar systems – equilibrium of spatial concurrent force systems.

### UNIT - III

**FRICTION:** Introduction – Theory of friction – Angle of friction – Laws of friction - static friction – Kinetic friction-friction in bodies moving up or down on an inclined plane-screw friction and screw jack.

### UNIT - IV

**CENTROIDS AND CENTERS OF GRAVITY :** Centre of gravity – centroids of area and lines – determination of centroids by integration – centroids of composite figures – theorems of Pappus.

### UNIT - V

**AREA MOMENT OF INERTIA :** Moment of inertia – polar moment of Inertia – Radius of gyration - Transfer theorem for moment of Inertia – Moment of inertia of composite areas – product of inertia – Transfer formula for product of Inertia.



**MASS MOMENT OF INERTIA :** Moment of inertia of masses – Radius of gyration – Transfer formula for mass moment of inertia – Mass moment of Inertia by Integration.

### **UNIT - VI**

**KINEMATICS :** Rectilinear motion-curve motion - Rectangular components of curve motion - Normal and Tangential components of acceleration, Radial and transverse components - Kinematics of rigid bodies - angular motion – fixed axis rotation – Definition and analysis of plane motion.

### **UNIT - VII**

**KINETICS:** Kinetics of rigid bodies – equation of plane motion – fixed axis rotation – rolling bodies (simple examples) - general plane motion (Simple examples).

### **UNIT - VIII**

**WORK ENERGY METHODS :** Work energy equations for translation – applications to particle motion – connected systems – fixed axis rotation (Simple cases)

### **TEXT BOOKS :**

1. I.B. Prasad, “Applied Mechanics”, Khanna Publishers, 19<sup>th</sup> Edition, 2009.
2. Ferdinand L. Singer, “Engineering Mechanics”, Harper Collins Publishers India, 3<sup>rd</sup> Edition, 2008.

### **REFERENCES :**

1. Irving. H. Shames, “Engineering Mechanics”, PHI Publishers, 4<sup>th</sup> Edition, 2008.
2. Timoshenko & Young, “Engineering Mechanics”, MGH Publishers, 4<sup>th</sup> Edition, 2010.
3. A.K. Tayal, “Engineering Mechanics”, Umesh Publishers, 13<sup>th</sup> Edition, 2008.
4. K.L. Kumar, “Engineering Mechanics”, TMH Publishers, 3<sup>rd</sup> Edition, 2009.



## BASIC ELECTRICAL ENGINEERING

**Course Code : AEE1136**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>1</b>	<b>0</b>	<b>4</b>

### **AIM :**

The aim of the course is to teach the Basic Fundamentals of Electrical Engineering.

### **OBJECTIVES :**

Basic Electrical Engineering is a basic fundamental course for the disciplines of CSE and IT. Hence it is introduced in I-Year –I Sem so that the students will have to understand the topics related to Electrical Applications in the later studies.

### **UNIT - I**

#### **INTRODUCTION TO ELECTRICAL ENGINEERING**

Introduction, SI units, charge & current, voltage, power & energy, circuit elements. Ohm's law, Nodes, Branches & Loops, Kirchoff's laws, series resistors and voltage division, parallel resistors and current division (simple problems).

### **UNIT - II**

#### **DC CIRCUITS**

Wye–Delta transformation, source transformation, super position, Thevenin's, Norton's, Maximum power transfer theorems (simple problems).

### **UNIT - III**

#### **MAGNETIC CIRCUITS**

Magnetic field due to Electric current, force on current carrying conductor, Electro Magnetic Induction, Direction of Induced EMF's, EMF induced in a coil, comparison of electric, magnetic circuits, self and mutual inductance.

## UNIT - IV

### AC CIRCUITS

Introduction, Capacitors, series and parallel capacitors, Inductors, series, parallel inductors, sinusoids, Phasors, phasor relationships for circuit elements, impedance, admittance, instantaneous and average power, RMS values, apparent power, power factor, complex power.

## UNIT - V

### TRANSFORMERS

Working Principle, construction, types, rating, induced EMF, ideal transformer, magnetizing and core loss current, voltage regulation, efficiency (simple problems), Auto transformer (elementary treatment only).

## UNIT - VI

### DC MACHINES

Constructional features, emf and torque, DC machine excitation, characteristics of DC motors and speed control, losses, efficiency (simple problems), (elementary treatment only).

## UNIT - VII

### AC MACHINES

**SYNCHRONOUS MACHINE:** Constructional details, EMF equation, determination of synchronous reactance, voltage regulation (simple problems), Principle of operation of a synchronous motor.

**INDUCTION MOTOR:** Constructional details, principle of operation, slip, rotor frequency, torque equation (simple problems) (Elementary treatment only).

## UNIT - VIII

### BASIC INSTRUMENTS

Introduction, classification of Instruments, operating Principles, Basic requirements for measurement, Moving Coil Permanent Magnet (PMMC) instruments, Moving Iron of Ammeters and Voltmeters (elementary treatment only).

**TEXT BOOKS :**

1. Charles k Alexander, Mathew N.O. Sadiku, “Fundamentals of Electric Circuits”, McGraw-Hill Companies. (Units 1,2,4)
2. D.P. Kothari & I.J. Nagrath, “Theory and Problems of Basic Electrical Engineering”, PHI (Units 3, 5, 6, 7, 8)

**REFERENCE :**

1. I Mckenzie Smith, “Electrical & Electronic Technology , Hughes” Pearson Education.



## PHYSICS AND CHEMISTRY LAB

Course Code : ABP1102

L	T	P	C
0	0	3	2

### AIM :

To give prerequisites to understand the advanced Physics & Chemistry leading to applications in engineering field.

### OBJECTIVES :

Training the students to understand the principles and concepts helpful in performing experiments in laboratory classes individually. To mould them to solve any technical problem in general.

### LIST OF PHYSICS EXPERIMENTS

Any **SIX** of the following experiments are to be performed during the semester

01. Determination of rigidity modulus of the material of a given wire– Torsional pendulum
02. Verification of laws of vibration of stretched string - Sonometer
03. Determination of radius of curvature of a given convex lens - Newton's rings
04. Determination of wavelength of spectral lines of a mercury spectrum - Diffraction grating
05. Study of frequency response of LCR series and parallel resonant circuits
06. Study of variation of magnetic field along a circular current carrying conductor – Stewart & Gee apparatus
07. Determination of Hall coefficient and carrier concentration - Hall effect

08. Study of I-V characteristics of a solar cell
09. Optical Fibers – Determination of numerical aperture and losses in fibers
10. Measurement of dielectric constant of material by Waveguide method

### LIST OF CHEMISTRY EXPERIMENTS

Any **SIX** of the following experiments are to be performed during the semester.

1. Preparation of standard potassium dichromate and determination of ferrous iron.
2. Determination of hardness of water by EDTA method.
3. Determination of dissolved oxygen in water.
4. Determination of chlorides in water.
5. Determination of iron-II by potentiometric method.
6. Determination of viscosity of lubricant by viscometer.
7. Determination of flash and fire points of oils.
8. Determination of percentage residue of carbon in oils.
9. Determination of calorific value of solid fuels.
10. Colorometric determination of iron in cement.

### REFERENCES :

1. J.Mendham Et.al., “Vogel’s text book of Quantitative Chemical Analysis”, 6<sup>th</sup> Edn. Pearson Education.
2. Dr. K. B. Chandrasekhar, “Chemistry practical lab manual”.
3. K.Sudha Rani, “Laboratory Manual on Engineering Chemistry”



## ENGINEERING DRAWING

Course Code : AME1102

L	T	P	C
0	0	3	2

### AIM & OBJECTIVES :

1. To make the student familiar to the drawing practices and convention
2. To familiarize the student about various engineering curves used in industry
3. To enable the student draft simple engineering components.

### LIST OF EXERCISES

- 1 Introduction to Engineering drawing & basics of Geometrical construction
- 2 Construction of parabola, ellipse, hyperbola
- 3 Construction of Involute and Cycloidal curves
- 4 Projections of points and lines inclined to one plane
- 5 Projections of lines inclined to both the planes
- 6 Projections of planes in simple positions, planes inclined to one plane
- 7 Projections of planes inclined to both the planes
- 8 Demonstration & Practice: Computer aided drafting of lines, planes and dimensioning
- 9 Projections of solids in simple positions
- 10 Projections of solids inclined to both the planes
- 11 Isometric projections
- 12 Demonstration & Practice: Computer aided drafting of solids and dimensioning.

**TEXT BOOKS :**

1. N.D. Bhatt, V.M. Panchal, “Engineering Drawing”, Charotar Publication House, 49<sup>th</sup> Edition, 2008.
2. R.B. Choudary “Engineering graphics with Auto CAD”, Anuradha Publishes
3. Trymbaka Murthy, “Computer Aided Engineering Drawing”, I.K. International, 3<sup>rd</sup> Edn. I.K. International, 2007





## PC SOFTWARE LAB

Course Code : ACT1101

L	T	P	C
0	0	3	2

### AIM :

To give basic computer knowledge for the students in software installation and hardware

### OBJECTIVE :

To make the students self reliant in maintaining their computer system

### List of Experiments :

- 1. Installation of Linux :** on the computer wherein the windows was installed. The system should be configured as dual boot with both windows and Linux.
- 2. Hardware Troubleshooting :** Identification of the problem of a PC which does not boot (due to improper assembly or defective peripherals) and fixing it to get the computer back to working condition.
- 3. Software Troubleshooting:** Identification of the problem of a malfunctioning CPU (due to some system software problems) and fixing it to get the computer back to working condition.
- 4. Connectivity Boot Camp :** Connectivity to the Local Area Network and accessibility to the Internet. TCP / IP setting.
- 5. Exposure on Internet and usage of Internet:** mail account creation and use, using search engines, interaction with people using forums.
- 6. Hands on Exposure on DOS commands -1:**  
Using help command for finding information about commands.  
Using file processing commands (move, copy, dir, mkdir, rmdir, attrib)

**7. Hands on Exposure on DOS commands -2:**

Using text processing commands (find ,findstr, etc..)

Using disk utility commands (format, chkdsk, chknfts, disk comp disk copy etc..)

**8. Hands on Exposure on Unix shell commands -1:**

Using man, info commands for finding information about commands.

Using file processing commands (ls, cp, mv, ln, mkdir, rmdir, chmod etc..)

**9. Hands on Exposure on Unix shell commands-2:**

Using text processing commands ( grep, egrep, sed etc...)

Using disk utility commands, mount commands (du,df,mount etc..)

**10. Using Vi Editor:** learning the three modes of Vi Editor-Insert Mode-command mode-Colon mode**11. Modification of CMOS settings :**

Changing of Boot device priority, putting passwords, disabling and enabling of external devices.

**12. Installation and Uninstallation of Antivirus :**

Installation of any free Antivirus like AVG , MCAFEE etc..

Uninstallation of Antivirus.

**13. Using System tools in windows:**

Disk defragmenter, system Restore ,Disk cleanup, character map

**14. Installation and configuration of printer and scanner software.**

Installation and configuration of any printer and scanner software.



---

---

***SYLLABI FOR II SEMESTER***

---

---



## ENGLISH

Course Code : AHE1101

L	T	P	C
4	0	0	4

### Reading and Writing skills

#### OBJECTIVES :

The primary objective of the course is to help students of engineering to achieve a sound foundation in communicational skills, basic grammar and vocabulary. It also enables them to become successful communicators in academic, professional and social areas of life.

The course aims to enable the students to use English effectively for the purpose of

- Understanding class room lectures in different subjects
- Reading technical and general materials
- Effective written communication in professional contexts

#### OUTCOMES :

- The learners develop adequate skills in skimming, scanning, intensive and extensive reading
- The learners also develop enough vocabulary to be clearly expressive in any group - Professional or Managerial or Social
- The learners can correspond and communicate in descriptive, analytical modes with ease.

#### COURSE WORK :

To achieve the above objectives, instruction will be imparted through relevant ESP materials, articles from newspapers, technical journals, magazines, industry materials etc. in classes and laboratory. Students will be given individual and holistic practice in LSRW skills.

## Contents :

### Reading :

- Reading with a purpose; Reading for understanding; skimming, scanning etc;
- Reading and interpreting charts and diagrams
- Vocabulary, synonyms, antonyms, prefixes, suffixes, confusables, one-word substitutes etc.

### Writing :

- common errors, articles, prepositions, tenses, concord, phrasal verbs, modals, conditionals etc. ( Remedial Grammar)
- Practice of writing- definition, description
- Paragraph writing with coherence, cohesiveness and clarity
- Essay, report and précis writing

**Reference skills :** Use of dictionary, thesaurus, library and internet materials.

## UNIT - I

1. Around the House (*Language in Use*)
2. Education on Education (*English for Engineers*)

## UNIT - II

1. On Holiday (*Language in Use*)
2. Vocabulary- synonyms, antonyms, prefixes, suffixes, confusables, one-word substitutes etc.

## UNIT - III

1. Imagining (*Language in Use*)
2. Tenses & Concord, Articles & Prepositions

## UNIT - IV

1. New Information Technology and Poverty Eradication (English for Engineers)
2. The media (Language in Use)

## UNIT - V

1. What we must Learn from the West (*English for Engineers*)
2. Paragraph writing, Note-making and Minute writing

## UNIT - VI

1. Essay writing
2. Value added Life (*English for Engineers*)

## UNIT - VII

1. Breaking the Law (*Language in Use*)
2. Key item (*English for Engineers*)

## UNIT - VIII

1. Letter and Précis writing
2. Dialogue writing

## TEXT BOOKS :

1. “Language in Use(Intermediate)”, Cambridge University Press India Pvt. Ltd.- Reprint-2008.
2. “English for Engineers”, Regional Institute of English, Bangalore, Foundation Books Pvt. Ltd, 2006.

## REFERENCES :

1. Eric H. Glendinning & Beverly Holmstorm, “Study reading- A course in reading skills for academic purposes”-CUP , 2004.
2. Liz Hamp Lyons, Ben Heasley, “Study writing”, CUP, 2004.
3. Norman Lewis, “Word Power Made Easy”, Lotus Press, 2006.
4. Michael Swan, “Practical English Usage”, Oxford University Press, 3<sup>rd</sup> Edition, 2005.
5. Murphy “Murphy’s English Grammar”, CUP, 3<sup>rd</sup> Edition, 2004.

**SUGGESTED READING :** Stories of humour, adventure, mystery and autobiographies of eminent scientists.



## MATHEMATICS – II

(Common to all Branches)

**Course Code : ABM1102**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>1</b>	<b>0</b>	<b>4</b>

### AIM :

To impart the necessary fundamental principles that are essential to study the core courses of Engineering

### OBJECTIVE :

To motivate and inculcate the logical thinking and methodical approach to solve mathematical problems

### UNIT - I

Matrices: Rank – Normal form - Echelon form – Consistency – Solution of system of simultaneous linear homogeneous and non-homogeneous equations.(Gauss Jordan)

(2.8, 2.11)

### UNIT - II

Eigen values, Eigen vectors – properties – Cayley-Hamilton Theorem (only statement) - Inverse and powers of a matrix by Cayley-Hamilton theorem – Diagonalisation of matrix. (2.14-2.17)

### UNIT - III

Quadratic forms - Linear Transformation - Orthogonal Transformation. Reduction of quadratic form to canonical form, Nature of the quadratic form.

(2.12, 2.18 , 2.19).

### UNIT - IV

Double and triple integrals, Change of order, change of variables

(7.1 – 7.3 , 7.5, 7.7).



## UNIT - V

Vector Differentiation: Differentiation of vectors, Scalar and Vector point functions. Gradient of a scalar field and directional derivatives- Divergence and curl of a Vector field and it's physical interpretation.

(8.1, 8.4 – 8.8)

## UNIT - VI

Vector Integration - Line integral – -Circulation-work done - surface and volume integrals Vector integral theorems: Green's theorem- Stoke's and Gauss's Divergence Theorem (Without proof). Verification of Green's - Stoke's and Gauss's Theorems. (8.10 – 8.17)

## UNIT - VII

Fourier series: Euler's formulae, Conditions for Fourier expansion, Change of interval, even and odd functions, half range series.

(10.1 – 10.7)

## UNIT - VIII

Fourier integral theorem – Fourier sine and cosine integrals. Fourier transforms – Fourier sine and cosine transforms – properties – Finite Fourier transforms.

(22.1 – 22.4)

## TEXT BOOK :

1. Dr.B.S.Grewal “Higher Engineering Mathematics”, 40<sup>th</sup> Edition, Khanna Publishers

## REFERENCES :

1. Kreyszig E, “Advanced Engineering Mathematics”, 8<sup>th</sup> Ed. John Wiley, Singapore (2001)
2. Greenberg M D, “Advanced Engineering Mathematics”, 2<sup>nd</sup> Ed, Pearson Education, Singapore, Indian Print (2003).



## PROBABILITY, STATISTICS AND NUMERICAL METHODS

Course Code : ABM1103

L	T	P	C
4	1	0	4

### AIM :

To acquire basic knowledge in concepts of Probability Statistics and Numerical Computation.

### OBJECTIVE :

The student shall be able to apply the methods of Probability distributions, perform Statistical analysis and draw inference in various Engineering problems and also shall be able to apply methods of Numerical Computation for real time problems.

**Pre requisites :** Basic concepts of Probability and calculus.

### UNIT - I

**RANDOM VARIABLES** - Discrete distribution - continuous distribution - expectation-moment generating function – probability generating function.  
(26.7, 26.8, 26.9, 26.10, 26.11, 26.12)

### UNIT - II

**DISTRIBUTIONS** - Binomial distribution - Poisson distribution - normal distribution - probable error – Normal approximation to Binomial distribution  
(26.13, 26.14, 26.15, 26.16, 26.17, 26.18)

### UNIT - III

**SAMPLING DISTRIBUTION** – Test of Hypothesis – test of significance for large samples – sampling distribution of the mean – central limit theorem – confidence limits for unknown mean – Test of significance for to large samples  
(27.1 to 27.12)

## UNIT - IV

**SAMPLING OF VARIABLES-SMALL SAMPLES** – Students t-distribution – significance test of a sample mean - significance test of difference between sample means – Chi square test – Goodness of fit  
(27.13, 27.14, 27.15, 27.16, 27.17, 27.18)

## UNIT - V

**SOLUTIONS OF ALGEBRAIC AND TRANSCENDENTAL EQUATION** – Bisection method – Regula Falsi – Newton Raphson method, deductions from Newton Raphson method – finite differences – differences of polynomial - other difference operators.  
(28.1, 28.2, 28.3, 29.1, 29.2, 29.4)

## UNIT - VI

**INTERPOLATION** - Newton's forward interpolation – Newton's backward interpolation – Interpolation with unequal intervals : Lagrange's interpolation - Newton's divided difference interpolation  
( 29.5, 29.8)

## UNIT - VII

**NUMERICAL DIFFERENTIATION** - derivatives using Newton's forward difference formula - derivatives using Newton's backward difference formula.

**NUMERICAL INTEGRATION** –Newton cotes formula - Trapezoidal rule – Simpson's 1/3 Rule –Simpson's 3/8 Rule – weddle's rule.  
(29.10(1,2), 29.12)

## UNIT - VIII

**NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS** - Picard's method - Solution by Taylor's series - Euler's Method – Modified Euler's method - Runge-Kutta Method.  
(31.1, 31.2, 31.3, 31.4, 31.5, 31.7)

**TEXT BOOK :**

1. Dr.B.S.Grewal, “Higher Engineering Mathematics”, 40<sup>th</sup> Edition, Khanna Publishers

**REFERENCES :**

1. Erwin Miller and John E.Freund, “Probability and Statistics for Engineers”, Prentice-Hall of India, Pearson, 16<sup>th</sup> Edition.
2. S.S .Sastry, “Introductory Methods of Numerical Analysis”, PHI, 14<sup>th</sup> Edition.



## ENVIRONMENTAL STUDIES

**Course Code : ABE1101**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>

### **AIM :**

To create awareness on environmental hazards.

### **OBJECTIVE :**

The student shall acquire knowledge regarding utilization of natural resources, and the imbalance in ecosystems, environmental pollution caused by various practices and safe guards to be taken.

### **UNIT - I**

**MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES :** Definition, Scope and Importance – Need for Public Awareness.

### **UNIT - II**

**NATURAL RESOURCES :** Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use and over – exploitation, deforestation, case studies – Timber extraction – Mining, dams and other effects on forest and tribal people – Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems -Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. - Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. – Energy resources: Growing energy needs, renewable and non-renewable energy sources use of alternate energy sources. Case studies. Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.

### UNIT - III

**ECOSYSTEMS :** Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem - Ecological succession. - Food chains, food webs and ecological pyramids. - Introduction, types, characteristic features, structure and function of the following ecosystem:

- a. Forest ecosystem
- b. Grassland ecosystem
- c. Desert ecosystem
- d. Aquatic ecosystems  
(ponds, streams, lakes, rivers, oceans, estuaries)

### UNIT - IV

**BIODIVERSITY AND ITS CONSERVATION :** Introduction - Definition: genetic, species and ecosystem diversity.- Bio-geographical classification of India - Value of biodiversity: consumptive use, productive use, social,ethical, aesthetic and option values - . Biodiversity at global, National and local levels. - . India as a megadiversity nation - Hot-spots of biodiversity - Threats to biodiversity: habitat loss, poaching of wildlife, manwildlife conflicts. - Endangered and endemic species of India - Conservation of biodiversity: In-situ and Exsitu conservation of biodiversity.

### UNIT - V

**ENVIRONMENTAL POLLUTION :** Definition, Cause, effects and control measures of :

- a. Air pollution
- b. Water pollution
- c. Soil pollution
- d. Marine pollution
- e. Noise pollution
- f. Thermal pollution
- g. Nuclear hazards

**SOLID WASTE MANAGEMENT :** Causes, effects and control measures of urban and industrial wastes. – Role of an individual in prevention of pollution. - Pollution case studies. - Disaster management: floods, earthquake, cyclone and landslides.

## UNIT - VI

**SOCIAL ISSUES AND THE ENVIRONMENT :** From Unsustainable to Sustainable development -Urban problems related to energy -Water conservation, rain water harvesting, watershed management -Resettlement and rehabilitation of people; its problems and concerns. Case Studies - Environmental ethics: Issues and possible solutions. -Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies. -Wasteland reclamation. -Consumerism and waste products. -Environment Protection Act. -Air (Prevention and Control of Pollution) Act. -Water (Prevention and control of Pollution)

Act -Wildlife Protection Act -Forest Conservation Act -Issues involved in enforcement of environmental legislation. -Public awareness.

## UNIT - VII

**HUMAN POPULATION AND THE ENVIRONMENT :** Population growth, variation among nations. Population explosion - Family Welfare Programme. -Environment and human health. -Human Rights. -Value Education. -HIV/AIDS. -Women and Child Welfare. -Role of information Technology in Environment and human health. -Case Studies.

## UNIT - VIII

**FIELD WORK :** Visit to a local area to document environmental assets River /forest grassland/hill/mountain -Visit to a local polluted site-Urban/Rural/industrial/ Agricultural Study of common plants, insects, birds. - Study of simple ecosystems-pond, river, hill slopes, etc.

## TEXT BOOKS :

- 1 Erach Bharucha, “Textbook of Environmental Studies for Undergraduate Courses”, University Press, Reprint 2005.
- 2 R. Rajagopalan, “Environmental Studies”, Oxford University Press, 2nd Edn. 2011..

## REFERENCE :

1. M. Anji Reddy, B “Textbook of Environmental Sciences and Technology”



## COMPUTER PROGRAMMING THROUGH C

**Course Code : ACT1102**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>1</b>	<b>0</b>	<b>4</b>

### **AIM :**

To give the basic idea about programming.

### **OBJECTIVE :**

To make the students capable of programming in high level computer languages as well as applications.

### **UNIT - I**

Algorithm, Flow chart, Program development steps, Basic structures of C Language, C tokens, Data types and sizes, Declaration of variables, Assigning values, Arithmetic, Relational and Logical operators, Increment and decrement operators, Conditional operator, Bitwise operators, Type conversions, Expressions, evaluation, Input output statements, blocks.

### **UNIT - II**

If and switch statements, while, do while and for statements. C programs covering all the above aspects.

### **UNIT - III**

One dimensional and two dimensional arrays, Initialization, String variables declaration, reading, writing, basics of functions, parameter passing, String handling functions.

### **UNIT - IV**

User defined functions, recursive functions, variables and storage classes, scope rules, block structure, header files, C preprocessor, Example C Programs.



## UNIT - V

Pointers and arrays: Pointers and addresses, Pointers and arrays, Pointers and function arguments, address arithmetic, character pointers and functions

## UNIT - VI

Pointers to pointers, multi-dimensional arrays, initialization of pointer arrays, command line arguments, pointers to functions, function pointers.

## UNIT - VII

Structure definition, initializing, assigning values, passing of structures as arguments, arrays of structures, pointers to structures, self reference to structures, unions, type-defs, bit fields, C program examples.

## UNIT - VIII

Console and file-I/O: Standard I/O, Formatted I/O, Opening and closing of files, I/O operations on files, command line arguments.

## TEXT BOOKS :

1. Herbert Schild, "Complete Reference Using C", 4<sup>th</sup> Edition, Tata McGraw Hill, 2009.
2. Yashawanth Kanethkar, "Let us C", 9<sup>th</sup> Edition, BPB Publishers, 2009.

## REFERENCES :

1. B.A.Fouruzan and R.F.Gilberg, "Computer Science, A structured Programming Approach using C", 3<sup>rd</sup> Edition, Thomson Publishers, 2008.
2. B.W.Kerninghan and Dennis M. Ritchie, "C Programming Language", 2nd Edition, Pearson Education, 2009.
3. Stephen G.Kochan, "Programming in C" 3<sup>rd</sup> Edition, Pearson Education, 2005.
4. N. B. Venkateswarlu, E. V. Prasad, "C & Data structures", 1<sup>st</sup> Edition, S. Chand Publications, 2002.



## ENGLISH LANGUAGE LAB

**Course Code: AHE1102**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>3</b>	<b>2</b>

The **Language Lab** focuses on the production and practice of sounds of language and familiarizes the students with the use of English in everyday situations and contexts.

### OBJECTIVES :

- To make students recognise the sounds of English through Audio-Visual aids and Computer Software.
- To help them overcome their inhibitions and self-consciousness while speaking in English and to build their confidence. *The focus shall be on fluency rather than accuracy.*
- To enable them to speak English correctly with focus on stress and intonation.

### SYLLABUS :

The following course content is prescribed for the **English Language Laboratory** sessions:

1. Introduction to the Sounds of English- Vowels, Diphthongs & Consonants.
2. Introduction to Stress and Intonation.
3. Situational Dialogues / Role Play.
4. Oral Presentations- Prepared and Extempore/Speaking personally
5. 'Just A Minute' Sessions (JAM).
6. Describing things / Narration
7. Information Transfer

8. Debate
9. Telephoning Skills.
10. Giving Directions.

### **SUGGESTED SOFTWARE :**

- Cambridge Advanced Learners' English Dictionary with CD.
- The Rosetta Stone English Library
- Clarity Pronunciation Power
- Mastering English in Vocabulary, Grammar, Spellings, Composition
- Dorling Kindersley series of Grammar, Punctuation, Composition etc.
- Language in Use, Foundation Books Pvt Ltd with CD.
- Learning to Speak English - 4 CDs
- Microsoft Encarta with CD
- Murphy's English Grammar, Cambridge with CD

### **REFERENCES :**

1. Spoken English (CIEFL) in 3 volumes with 6 cassettes, OUP.
2. "English Pronouncing Dictionary" Daniel Jones Current Edition with CD.
3. R.K. Bansal and J.B. Harrison, "Spoken English", Orient Longman 2006.
4. J. Sethi, Kamlesh Sadanand & D.V. Jindal, "A Practical Course in English Pronunciation, (with two Audio cassettes)", Prentice-Hall of India Pvt. Ltd., New Delhi.
5. T.Balasubramanian (Macmillan), "A Text Book of English Phonetics for Indian Students", 18<sup>th</sup> Reprint, 2005.
6. "English Skills for Technical Students", WBSCTE with British Council, OL



## ENGINEERING WORKSHOP

**Course Code : AMT1101**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>3</b>	<b>2</b>

### AIM :

To provide hands on experience on basic Engineering and IT related skills.

### OBJECTIVES :

- \* To train the student in the basics of computer components, maintenance, software(s) installation and office tools.
- \* To demonstrate and train the students in basic professional trades.

### COMPULSORY EXERCISES :

- Identification of the peripherals of a computer, components in a CPU and its functions - Block diagram of the CPU along with the configuration of each peripheral. Disassembly and assembly of a personal computer.
- Installation of MS windows on the personal computer.
- One lamp controlled by a one-way switch and (b) Two-way switching for stair-case lamp

### ANY NINE EXERCISES FROM THE FOLLOWING :

- **Carpentry:** Making a Cross-half lap joint using wooden pieces
- **Carpentry:** Making a Mortise and Tenon joint using wooden pieces
- **Fitting:** Preparation of a V-fit between mild steel flat pieces
- **Fitting:** Preparation of a Square-fit between mild steel flat pieces

- **Foundry:** Preparation of a sand mould using a single piece pattern
- **Foundry:** Preparation of a sand mould using a split piece pattern
- **Tin-Smithy:** Preparation of a sheet metal pipe-joint using tin-smithy tools
- **Tin-Smithy:** Preparation of a sheet metal funnel using tin-smithy tools
- **Welding:** Making a Lap joint through arc welding
- **Lathe Machine:** Demonstration of turning related activities on Lathe machine
- **Black smithy:** Demonstration of Black smithy trade
- **Plumbing:** Demonstration of Plumbing trade
- **Installation of Linux** on the computer wherein the windows was installed. The system should be configured as dual boot with both windows and Linux.
- **Hardware Troubleshooting :** Identification of the problem of a PC which does not boot (due to improper assembly or defective peripherals) and fixing it to get the computer back to working condition.
- **Software Troubleshooting :** Identification of the problem of a malfunctioning CPU (due to some system software problems) and fixing it to get the computer back to working condition.
- **Connectivity Boot Camp :** Connectivity to the Local Area Network and accessibility to the Internet. TCP / IP setting.
- **Web Browsers, Surfing the Web :** Customization the web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers. Also, plug-ins like Macromedia Flash and JRE for applets should be configured.

- **Using LaTeX and / word :** Creation of project certificate. Exposure to features like:- Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Using Date and Time option in both LaTeX and / Word.
- **Creating project abstract :** Features to be covered are: Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.
- **Creating a Newsletter :** Features to be covered are : Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes and Paragraphs
- **Creating a Feedback form** - Features to be covered are: Forms, Text Fields, Inserting objects, Mail Merge in Word.
- **Excel Orientation : Introduction of Excel** as a Spreadsheet tool, Using Excel –Accessing, overview of toolbars, saving excel files, Using help and resources
- **Creating a Scheduler** - Features to be covered are: Gridlines, Format Cells, Summation, auto fill, Formatting Text
- **Calculating GPA** - Features to be covered:- Cell Referencing, Formulae in excel – average, standard deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function, LOOKUP/VLOOKUP
- **Performance Analysis** - Features to be covered:- Split cells, freeze panes, group and outline, Sorting, Boolean and logical operators, Conditional formatting

- **Power point presentation**
- Exposure to basic power point utilities and tools (PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in both LaTeX and Power point, Hyperlinks, inserting Images, Clip Art, Audio, Video, Objects, Tables, Charts) .to create basic power point presentation.



## COMPUTER PROGRAMMING LAB

**Course Code : ACT1103**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>3</b>	<b>2</b>

### AIM :

To give basic knowledge with practical orientation of programming language.

### OBJECTIVE :

To train the students to write programmes in C language for different applications.

### LIST OF PROGRAMMES :

1. To write C programs for the following
  - a) Sum of individual digits of a positive integer.
  - b) A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a c program to generate to generate the first n terms of the Fibonacci sequence.
  
- 2
  - a) To write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user
  - b) To write a C program to calculate the following sum:  
Sum= $1+x^2/2!+x^4/4!$  ————— upto given 'n' terms.
  - c) To write a c program to find the roots of a quadratic equation.
  
3. To write C programs that uses both recursive and non-recursive functions
  - i) To find the factorial of a given number.
  - ii) To find the GCD(greatest common divisor) of two given integers.
  - iii) To solve Towers of Hanoi problem.



4. The total distance traveled by vehicle in 't' seconds is given by  $\text{distance} = ut + \frac{1}{2}at^2$  where 'u' and 'a' are the initial velocity (m/sec) and acceleration ( $\text{m/sec}^2$ ). Write a C program to find the distance traveled at regular intervals of time given values of 'u' and 'a'. The program should provide the flexibility to the user to select his own time intervals and repeat the calculations for different values of 'u' and 'a'.
5. Using switch-case statement, write a C program that takes two operands and one operator from the user, performs the operation and then prints the answer. (consider operators +, -, \*, and %).
6. Write a C program to find the largest and smallest number in a list of integers.
7. Write a C program that uses functions to perform the following
  - a. Addition of Two Matrices
  - b. Multiplication of Two Matrices
8. Write a C program that uses functions to perform the following operations
  - a. To insert a sub-string in to given main string from a given position
  - b. To delete n characters from a given position in given string.
9. Write a C program to determine if the given string is a palindrome or not.
10.
  - a) Write a C program that displays the position or index in the string S where the string T begins, or -1 if S does not contain T.
  - b) Write a C program to count the lines, words and characters in a given text.
11. To write a C program
  - a) to generate Pascal's triangle
  - b) to construct a pyramid of numbers

12. To write a C program to read in two numbers,  $x$  and  $n$ , and then compute the sum of this geometric progression  $1+x+x^2+x^3+\dots+x^n$   
For example : if  $n$  is 3 and  $x$  is 5, then the program computes  $1+5+25+125$ . print  $x, n$ , the sum.  
Perform error checking. For example the formula does not make sense for negative  
Exponents – if  $n$  is less than 0. Have your program print an error message if  $n < 0$ , then go back and read in the next pair of numbers of without computing the sum. Are any values of  $x$  also illegal? If so, test for them too..
13. To write a C program
  - a) to find the 2's compliments of a binary number.
  - b) to convert a Roman numeral to its decimal equivalent
14. To write a C program that uses functions to perform the following operations
  - a. Reading a complex number
  - b. Writing a complex number
  - c. Addition of 2 complex numbers
  - d. Multiplication of 2 complex numbers  
(Note: represent complex number using a structure)
15. To write a C program
  - a) to copy the contents from one file to another.
  - b) to reverse the first  $n$  characters in a file.  
(Note: the file name and  $n$  are specified on the command line)
  - c) to find the no. of characters, no. of words, no. of lines in a given file.
16. To implement the algorithms for the below given iterative methods using C to find one root of the equation  $f(x)=x \sin x + \cos x=0$ 
  - a) Bisection
  - b) False Position
  - c) Newton-Raphson
  - d) Successive approximation

17. To write C programs to implement the Lagrange interpolation
18. To implement the Newton- Gregory forward interpolation using C language.
19. To implement in C the linear regression algorithm.
20. To implement in C the polynomial regression algorithm.

### **TEXT BOOKS :**

1. P. Dey & M. Ghosh, "Programming in C", Oxford Univ. Press
2. E. Balaguruswamy, "C and Data Structures", TMH publications
3. P. Padmanabham, "C Programming and Data Structures", 3<sup>rd</sup> Edition, BS publications.
4. M.K. Jain, S.R.K. Iyengar & R.K. Jain, "Numerical Methods for Scientific and Engineering Computation", New Age International Publishers.
5. Aitkinson & Han, "Elementary Numerical Analysis", Wiley India, 3<sup>rd</sup> Edition 2006.





---

---

***SYLLABI FOR III SEMESTER***

---

---



## DISCRETE MATHEMATICAL STRUCTURES (Common to CSE & IT)

**Course Code: ABM1106**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>1</b>	<b>0</b>	<b>4</b>

### **AIM:**

To acquire basic knowledge in some concepts of discrete mathematical structures.

### **OBJECTIVE:**

The student shall be able to learn logical thinking and be able to apply enumerating techniques. The student shall be able to use graph theoretic techniques.

### **UNIT- I**

**MATHEMATICAL LOGIC-I:** Statements and notations, connectives, Well formed formulas, tautologies, equivalence of formulas, Duality law, Tautological Implications, other connectives, Normal forms, Rules of inference, consistency of premises and Indirect method of proof. (1-1, 1-2.1 to 1-2.4, 1-2.6 to 1-2.11, 1-2.14, 1-3.1 to 1-3.4, 1-4.2, 1-4.3 of [1])

### **UNIT- II**

**MATHEMATICAL LOGIC-II:** Predicates, the statement function, variables and quantifiers, predicate formula, free and bound variables, universe of discourse, inference theory of the predicate calculus, Automatic theorem proving.

(1-5.1 to 1-5.4, 1-6.1 to 1-6.4, 1-4.4 of [1])

### **UNIT- III**

**RELATIONS:** Relations, properties of binary relations in a set, Relation matrix and Graph of a relation, partition and covering of a set, equivalence relations, partial ordering, partially ordered set, lattices : Definition and examples, properties of lattices.

(2-3.1 to 2-3.5, 2-3.8, 2-3.9, 4-1.1, 4-1.2 of [1])

## UNIT- IV

**ALGEBRAIC STRUCTURES:** Algebraic systems : Definition and examples, Semi groups and monoids: Definitions and examples, Homomorphism of Semi groups and Monoids, Groups: Definitions, and examples, Subgroups and Homomorphisms, (3-1.1, 3-2.1, 3-2.2, 3-5.1, 3-5.2 of [1] )

## UNIT- V

**COMBINATORICS-I:** Basics of counting, Combinations and permutations, Enumeration of Combinations and permutations , Enumerating Combinations and permutations with repetitions, Enumerating permutations with constrained repetitions, Binomial coefficients, The binomial and Multinomial theorems, The principle of inclusion-exclusion (2.1-2.8 of [2])

## UNIT- VI

**COMBINATORICS-II:** Generating Functions of sequences, Calculating coefficients of generating functions, Recurrence relations, Solving Recurrence relations by substitution and generating functions, the method of characteristic roots, (3.1-3.5 of [2])

## UNIT- VII

**GRAPH THEORY I:** Basic concepts, Isomorphism and Subgraphs, Trees and their properties, spanning trees.(5.1-5.4 of [2])

## UNIT- VIII

**GRAPH THEORY II:** Directed Trees, Binary Trees, Planar graphs, Euler's formula, Multigraphs and Euler Circuits, (5.5-5.9 of [2])

## TEXT BOOKS:

- [1] J.P Tremblay R.Manohar, "Discrete Mathematical Structures with Applications to Computer Science", Tata McGraw-Hill Publishing Company Limited, 1997
- [2] J.L. Mott, A. Kandel, T.P. Baker, "Discrete Mathematics for Computer Scientists & Mathematicians", Prentice Hall of India Pvt Limited, New Delhi Second Edition.



---

**REFERENCE BOOK:**

Kenneth Bogart, Clifford Stein and Robert L. Drysdale, “Discrete Mathematics of Computer Science” Springer International Edition, 2006.



## COMPUTER ORGANIZATION

(Common to ECE, CSE, IT)

**Course Code: ACT1104**

L	T	P	C
4	1	0	4

### AIM:

To give detailed information about the structure of computers and internal organization of different units regarding memory I/O devices registers.

### OBJECTIVE:

Student will get an idea about the internal organization of the computer system and its internal operations.

### UNIT-I

**BASIC STRUCTURE OF COMPUTERS:** Computer Types, Functional unit, Basic operational concepts, Bus structures, Software, Performance, multiprocessors and multi computers, Multicore processors, Data Representation. Fixed Point Representation & Arithmetic, Error Detection codes.

### UNIT-II

**REGISTER TRANSFER LANGUAGE AND MICRO OPERATIONS:** Register Transfer language, Register Transfer Bus and memory transfers, Arithmetic Micro-operations, logic micro operations, shift micro operations, Arithmetic logic shift unit. Instruction codes. Computer Registers Computer instructions – Instruction cycle.

Memory – Reference Instructions. Input – Output and Interrupt. STACK organization. Instruction formats. Addressing modes. DATA Transfer and manipulation. Program control. Reduced Instruction set computer.

### UNIT-III

**MICRO PROGRAMMED CONTROL:** Control memory, Address sequencing, microprogram example, design of control unit Hard wired control. Microprogrammed control

### UNIT-IV

**COMPUTER ARITHMETIC:** Addition and subtraction, multiplication Algorithms, Division Algorithms, Floating – Point Representation, Floating – point Arithmetic operations, Decimal Arithmetic unit Decimal Arithmetic operations.

### UNIT-V

**THE MEMORY SYSTEM:** Basic concepts, semiconductor RAM memories, Read-only memories Cache memories performance considerations, Virtual memories secondary storage. Introduction to RAID, Hierarchical memory features.

### UNIT-VI

**INPUT-OUTPUT ORGANIZATION:** Peripheral Devices, Input-Output Interface, Asynchronous data transfer Modes of Transfer, Priority Interrupt, Direct memory Access, Input –Output Processor (IOP) Serial communication; Introduction to peripheral component, Interconnect (PCI) bus. Introduction to standard serial communication protocols like RS232, USB, IEEE1394.

### UNIT-VII

**PIPELINE AND VECTOR PROCESSING:** Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline Vector Processing, Array Processors.

### UNIT-VIII

**MULTI PROCESSORS:** Characteristics or Multiprocessors, Interconnection Structures, Interprocessor Arbitration. InterProcessor Communication and Synchronization Cache Coherence. Shared Memory Multiprocessors.

**TEXT BOOKS:**

1. Carl Hamacher, Zvonks Vranesic, SafeaZaky, “Computer Organization”, 5<sup>th</sup> Edition, McGraw Hill, 2009.
2. M.Moris Mano, “Computer Systems Architecture”, 3<sup>rd</sup> Edition, Pearson Education, 2006.

**REFERENCES:**

1. William Stallings, “Computer Organization and Architecture”, 6<sup>th</sup> Edition, Pearson Education 2006.
2. Andrew S. Tanenbaum, “Structured Computer Organization”, 5<sup>th</sup> Edition, PHI, Pearson Education, 2006.
3. Sivaraama Dandamudi, “Fundamentals of Computer Organization and Design, Springer Int. Edition, Springer, 2009.
4. John L. Hennessy and David A. Patterson, “Computer Architecture a Quantitative Approach”, 4<sup>th</sup> Edition Elsevier, 2009.
5. Joseph D. Dumas II, “Computer Architecture, Fundamentals and Principles of Computer Design”, 1<sup>st</sup> Edition, BS Publication, 2010.
6. John P. Hayes, “Computer Architecture and Organization”, 3<sup>rd</sup> Edition, Tata McGraw hill, 2009.



## DIGITAL LOGIC DESIGN

**Course Code:**AEC1142

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>

### AIM:

To provide necessary Digital fundamentals required for the construction of different circuits that required for computer science research and development.

### OBJECTIVE:

The student shall be able to deal with digital logic, counters, sequential circuits, combinational circuits etc.

### UNIT – I

**BINARY SYSTEMS:** Digital Systems, Binary Numbers, Number base conversions, Octal and Hexadecimal Numbers, complements, Signed binary numbers, Binary codes, Binary Storage and Registers, Binary logic.

### UNIT - II

**BOOLEAN ALGEBRA AND LOGIC GATES:** Basic Definitions, Axiomatic definition of Boolean Algebra, Basic theorems and properties of Boolean algebra, Boolean functions, canonical and standard forms, other logic operations, Digital logic gates, integrated circuits.

### UNIT - III

**GATE – LEVEL MINIMIZATION:** The map method, Four-variable map, Five-Variable map, Product of sums simplification, Don't-care conditions, NAND and NOR implementation, other Two-level implementations, Exclusive – OR function.

### UNIT - IV

**COMBINATIONAL LOGIC:** Combinational Circuits, Analysis procedure, Design procedure, Binary Adder-Subtractor, Decimal Adder, Binary multiplier, Magnitude comparator, Decoders, Encoders, Multiplexers.

## UNIT - V

**SYNCHRONOUS SEQUENTIAL LOGIC:** Sequential circuits, latches, Flip-Flops, Analysis of clocked sequential circuits, State Reduction and Assignment, Design Procedure.

## UNIT - VI

Registers, shift Registers, Ripple counters, synchronous counters, Other counters.

## UNIT - VII

Introduction, Random-Access Memory, Memory Decoding, Error Detection and correction, Read-only memory, Programmable logic Array, Programmable Array logic, Sequential Programmable Devices.

## UNIT - VIII

Asynchronous Sequential Logic : Introduction, Analysis Procedure, Circuits with Latches, Design Procedure, Reduction of state and Flow Tables, Race-Free state Assignment Hazards, Design Example.

### TEXT BOOKS:

1. M.Morris Mano, “Digital Design”, 3<sup>rd</sup> Edition, Pearson Education, 2009.
2. Roth, “Fundamentals of Logic Design”, 5<sup>th</sup> Edition, Thomson Publishers, 2008.

### REFERENCES:

1. Donald Leach, Albert Paul Malvino, “Digital Principles & Applications”, 5<sup>th</sup> Edition, by TMH, 2003.
2. Zvi. Kohavi, “Switching and Finite Automata Theory”, 1<sup>st</sup> Edition Tata McGraw Hill, 2006.
3. C.V.S. Rao, “Switching and Logic Design”, 1<sup>st</sup> Edition Pearson Education, 2008.
4. Donald D.Givone, “Digital Principles and Design”, 1<sup>st</sup> Edition, Tata McGraw Hill, 2006.
5. M. Rafiquzzaman, Fundamentals of Digital Logic & Micro Computer Design”, 5<sup>th</sup> Edition, John Wiley, 2007.

## ELECTRONIC DEVICES AND CIRCUITS

Course Code: AEC1143

L	T	P	C
4	1	0	4

### AIM & OBJECTIVE:

To introduce the basic design concepts of low frequency & high frequency amplifiers & oscillators circuits using various transmissions for different applications.

### Unit – I

**DIODE CHARACTERISTICS:** Introduction to semiconductor materials, V-I Characteristics of diode, Zener Diode Characteristics, Zener Diode as Voltage Regulator, Tunnel diode, LED.

### UNIT-II

**RECTIFIERS AND FILTERS:** Introduction, Half wave rectifier, Full wave rectifier, Advantages of full wave rectifier over Half Wave rectifier, Inductor filter, C- Filter, LC- Filter,  $\pi$ - filter .

### UNIT-III

**TRANSISTOR CHARACTERISTICS:** Construction, current components, input & output Characteristics of transistor in CB, CE, CC configurations, Relations between  $\alpha$ ,  $\beta$ ,  $\beta$ .

### UNIT-IV

**FET CHARACTERISTICS:** Introduction, JFET Characteristics (qualitative and quantitative discussion), MOSFET Characteristics (Enhancement and depletion), V-I Characteristics of UJT .

### UNIT-V

**BIASING AND STABILITY:** Introduction, need for biasing, criteria for fixing the operating point, thermal run away, thermal stability, stabilization techniques.

## UNIT-VI

**SMALL SIGNAL AMPLIFIERS:** h-parameter representation of a transistor, Analysis of single stage transistor amplifier using h-parameters, comparison of transistor configurations in terms of  $A_v$ ,  $A_i$ ,  $R_i$ ,  $R_o$ .

## UNIT-VII

**NEGATIVE FEEDBACK AMPLIFIERS:** Concept of feedback, classification of feedback amplifiers, general characteristics of negative feedback amplifiers, effect of negative feedback on input and output characteristics.

## UNIT-VIII

**OSCILLATORS:** Introduction, condition for oscillations, RC Phase shift oscillator with Transistor, Wein bridge oscillator, Hartley and Collpits oscillators.

## TEXT BOOKS:

1. Millman Jacob , Halkias C Christos, “Integrated Electronics”, Tata Mcgrawhill publications.
2. Boylestad.Robert, “Electronic Devices And Circuits Theory”, PHI publications.

## REFERENCE BOOKS:

1. Sanjeev Gupta, “Electronic Devices And Circuits”, Dhanpat Rai publications.
2. Lal Kishore, “Electronic Devices & Circuits Vol I”, BSP publications.
3. Bhaskarram Murthy, K.Raja Rajeswari, “Electronic Devices And Circuits”
4. Raju GSN, “Electronic Devices And Circuits”, IK International.





## MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

**Course Code: AHM1101**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>1</b>	<b>0</b>	<b>4</b>

### **OBJECTIVE:**

To explain the basic principles of managerial economics, accounting practices and financial management techniques for effective business decision making and to promote entrepreneurial abilities among budding engineers

### **OUTCOME:**

To understand the economic environment and to give an idea on various accounting and

financial management techniques for effective utilization of economic resources

### **UNIT I**

**INTRODUCTION TO MANAGERIAL ECONOMICS:** Definition, Nature and Scope of Managerial Economics, Demand Analysis, Demand Determinants, Law of Demand and its exceptions

### **UNIT II**

**ELASTICITY OF DEMAND AND DEMAND FORECASTING:** Definition, Types, Measurement and Significance of Elasticity of Demand. Demand Forecasting, Factors governing demand forecasting, Methods of demand forecasting (Survey method, Statistical method, Expert opinion method, Test marketing, Controlled experiment, Judgmental approach)

### **UNIT III**

**THEORY OF PRODUCTION AND COST ANALYSIS:** Production Function – Isoquants and Isocosts, Laws of returns, Internal and External Economies of Scale

**COST ANALYSIS:** Types of Costs, Break Even Analysis (BEA) – Determination of Break Even Point (Simple numerical problems) – managerial significance and limitations of BEA

#### UNIT IV

**INTRODUCTION TO MARKETS:** Market Structures: Types of competition, features of perfect competition, monopoly and monopolistic competition, price output determination in case of perfect competition and monopoly

#### UNIT V

**FORMS OF BUSINESS ORGANIZATIONS:** Features of Business, Advantages, Limitations of Sole Proprietorship, Partnership and Joint Stock Company

#### UNIT VI

**INTRODUCTION TO FINANCIAL ACCOUNTING:** Accounting: Principles, concepts, conventions, double entry book keeping, Journal, Ledger, Trial Balance, Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments, international financial reporting standards (simple numerical problems)

#### UNIT VII

**FINANCIAL ANALYSIS THROUGH RATIOS:** Introduction, Advantages and limitations, Computation, Analysis and Interpretation of Liquidity ratios, Activity ratios, Solvency ratios and Profitability ratios (simple numerical problems)

#### UNIT VIII

**BUDGETING AND CAPITAL BUDGETING:** Introduction to Budgeting: Production budget, Flexible budget and Cash budget  
Definition, nature and scope of capital budgeting, features of capital budgeting proposals, methods of capital budgeting: Traditional and discounted methods (simple numerical problems)

---

## TEXT BOOKS

1. Aryasri, “Managerial Economics and Financial Analysis”, Tata McGraw Hill, 3/e,2009
2. Siddiqui and Siddiqui, “Managerial Economics and Financial Analysis”, New Age Publishers, 1/e, 2005

## REFERENCE BOOKS

1. R L Varshney and K L Maheswari, “Managerial Economics”, Sultan Chand & Sons
2. D Ragnunath Reddy & M V Narasimha Chary, “Managerial Economics and Financial Analysis”, SciTech Publications
3. Dwivedi, “Managerial Economics”, Vikas Publishers
4. P K Sharma and Shashi K Gupta, “Management Accounting”, Kalyani Publishers
5. S P Jain and K L Narang, “Financial Accounting”, Kalyani Publishers
6. Bhattacharya, “Management Accounting”, Pearson Education
7. P L Mehta, “Managerial Economics”, Sultan Chand & Sons



## DATA STRUCTURES USING C++

**Course Code:ACT1105**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>1</b>	<b>0</b>	<b>4</b>

### **AIM:**

To deliver the programming Techniques which are advanced for solving the problems regarding memory locations and also object oriented features.

### **OBJECTIVE:**

Student can get the grip on advanced programming and gets the knowledge to solve the problems regarding large data structures like stack, queue and heap, and gets good grip on pointers.

### **UNIT-I**

Different strategies for problem solving , need for OOP, overview of OOP principles –Encapsulation, inheritance, polymorphism .C++ Class Overview- Class Definition, Objects, Class Members, Access Control, Class Scope, Constructors and destructors, Inline functions, static class members, this pointer, friend function, dynamic memory allocation and deallocation (new and delete).

### **UNIT-II**

**POLYMORPHISM AND INHERITANCE:** Function Overloading, Operator Overloading, Generic Programming- Function and class templates, Inheritance basics, base and derived classes, inheritance types, base class access control, virtual base class, function overriding, runtime polymorphism using virtual functions, abstract class.

### **UNIT-III**

Streams, libraries and error handling-stream classes hierarchy, console I/O, formatted I/O,file streams and string streams, exception handling mechanism , standard template library.

### **UNIT-IV**

Searching and sorting- linear and binary search methods, sorting-bubble sort, selection sort, insertion sort, quick sort, merge sort.

## UNIT-V

Introduction to data structures, singly linked lists, doubly linked lists, circular list, representing stacks and queues in C++ using arrays and linked lists, infix to post fix conversion, postfix expression evaluation.

## UNIT-VI

Trees-binary trees, terminology, representation, insertion, deletion, searching, traversals, Binary search trees, definition, ADT, implementation, operations-searching, insertion and deletion, Balanced search trees- AVL trees, definition, height of an AVL tree, representation, operations-insertion, deletion and searching.

## UNIT-VII

Priority Queues – Definition, ADT, Realizing a Priority Queue using Heaps, Definition, insertion, Deletion, Application-Heap Sort, Leftist Trees.

## UNIT-VIII

Graphs- terminology, representation, traversal( BFS and DFS) , minimal spanning trees, Kruskal’s algorithm, prim’s algorithm.

## TEXT BOOKS:

1. S.Sahni, “Data structures , Algorithms and Applications in C++”, 2<sup>nd</sup> edition, University Press(India) pvt ltd., 2005.
2. Langsam, M.J. Augenstein, A. M. Tanenbaum, “Data Structures Using C and C++”, 2<sup>nd</sup> edition, PHI Education, 2008.

## REFERENCE BOOKS:

1. Mark Allen Weiss, “Data structures and Algorithm analysis in C++”, 2<sup>nd</sup> edition, Pearson Education, 2010.
2. Herbert Schildt, “C++ The Complete Refernce”, 4<sup>th</sup> Edition, Tata McGrwaw Hill, 2009.
3. Ashok N.Kamthane, “Object Oriented Programming with ANSI & Turbo C++”, 1<sup>st</sup> Edition, Palgrave Publisher, 2010.
4. Barkakali Nagajyoti, “Object Oriented Programming using C++”, 1<sup>st</sup> Edition, PHI, 2008.
5. Vijayalakshmi Pai.A.G, “Data Structures and Algorithms Concepts, Techniques and applications”, Tata McGraw Hill, 2010.



## ANALOG & DIGITAL CIRCUITS LAB

Course Code: AEC1144

L	T	P	C
0	0	3	2

### AIM & OBJECTIVE:

To design & implement various analog and digital electronic circuits such as amplifiers, oscillators, combinational and sequential circuits.

#### Part- A

1. PN Junction diode characteristics.
2. Zener Diode Characteristics.
3. Rectifiers without filters (Full wave & half wave).
4. Transistor CE characteristics.
5. FET Characteristics.
6. CE Amplifier.
7. FET Amplifier.
8. RC Phase shift oscillator.

#### Part –B

1. Study of Logic Gates using Discrete Components.
2. Half Adder and Full Adder.
3. Encoder and Decoder.
4. Multiplexer and Demultiplexer.
5. Study of Flip-flops.
6. Asynchronous Counter.
7. Synchronous Counter.
8. Registers.

Note: Any FIVE experiments from PART –A and FIVE experiments from Part- B are to be conducted.



## DATA STRUCTURES LAB

**Course Code: ACT1106**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>3</b>	<b>2</b>

### **AIM:**

Same as the Data Structures using C++, but student will be taught practically.

### **OBJECTIVE:**

gets the practical knowledge to solve the problem regarding memory locations practically so that the student will be benefited in the usage of pointers.

1. Write C++ programs that use both recursive and non recursive functions to perform the following searching operations for a Key value in a given list of integers :
  - i) Linear search
  - ii) Binary search
2. Write C++ programs that implement the following sorting methods to sort a given list of integers in ascending order:
  - i) Bubble sort
  - ii) Quick sort
3. Write C++ programs that implement the following sorting methods to sort a given list of integers in ascending order:
  - i) Insertion sort
  - ii) Merge sort
4. Write C++ programs that implement stack (its operations) using
  - i) Arrays
  - ii) Singly linked list
5. Write C++ programs that implement Queue (its operations) using
  - i) Arrays
  - ii) Singly linked list
6. Write a C++ program to implement Circular queue
7. Write a C++ program that uses Stack operations to perform the following:

- i) Converting infix expression into postfix expression
- ii) Evaluating the postfix expression
8. Write a C++ program to perform the following operations on singly linked list to implement priority queue on student records.
  - i) Creation ii) Insertion iii) Deletion iv) Traversal v) Reversal
9. Write a C++ program to perform the following operations on circular doubly linked list.
  - i) Creation ii) Insertion iii) Deletion iv) Traversal in both ways
10. Write a C++ program to implement binary trees
  - i) Creating a Binary Tree of integers
  - ii) Insertion, searching
  - iii) Traversing the above binary tree in preorder, inorder and postorder.
11. Write a C++ program to perform the following operations:
  - i) Insert an element into a binary search tree.
  - ii) Delete an element from a binary search tree.
  - iii) Search for a key element in a binary search tree.
12. Write C++ programs for the implementation of bfs and dfs for a given graph.
13. Write C++ programs for the implementation of Prim's algorithm for shortest paths between every pair of nodes in the graph.
14. Write a C++ program to implement Kruskal's algorithm to generate a minimum cost spanning tree.





---

---

***SYLLABI FOR IV SEMESTER***

---

---



## UNIX AND SHELL PROGRAMMING

**Course Code:ACT1107**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>

### **AIM:**

An Introduction to UNIX Environment, through explanation of shell programming, as well as some system programming concepts.

### **OBJECTIVE:**

Student will get knowledge about unix environment. UNIX is the powerful O.S. which will be used on 90% of servers, hence while working in industry this knowledge should be helpful.

### **UNIT -I**

**INTRODUCTION TO UNIX:** Architecture of Unix, Features of Unix , Unix Commands – PATH, man, echo, printf, script, passwd, uname, who, date, stty, pwd, cd, mkdir, rmdir, ls, cp, mv, rm, cat, more, wc, lp, od, tar, gzip.

### **UNIT -II**

**UNIX UTILITIES:** Introduction to unix file system, vi editor, file handling utilities, security by file permissions, process utilities, disk utilities, networking commands, unlink, du, df, mount, umount, find, unmask, ulimit, ps, w, finger, arp, ftp, telnet, rlogin. Text processing utilities and backup utilities , detailed commands to be covered are tail, head , sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, pg, comm, cmp, diff, tr, awk, cpio

### **UNIT -III**

**INTRODUCTION TO SHELLS:** Unix Session, Standard Streams, Redirection, Pipes, Tee Command, Command Execution, Command-Line Editing, Quotes, Command Substitution, Job Control, Aliases, Variables, Predefined Variables, Options, Shell/Environment Customization.

**FILTERS:** Filters and Pipes, Concatenating files, Display Beginning and End of files, Cut and Paste, Sorting, Translating Characters, Files with Duplicate Lines, Count characters, Words or Lines, Comparing Files.

#### UNIT -IV

**GREP:** Operation, grep Family, Searching for File Content.

**SED:** Scripts, Operation, Addresses, commands, Applications, grep and sed.

#### UNIT -V

**AWK:** Execution, Fields and Records, Scripts, Operations, Patterns, Actions, Associative Arrays, String Functions, String Functions, Mathematical Functions, User – Defined Functions, Using System commands in awk, Applications, awk and grep, sed and awk.

#### UNIT -VI

**INTERACTIVE KORN SHELL:** Korn Shell Features, Two Special Files, Variables, Output, Input, Exit Status of a Command, eval Command, Environmental Variables, Options, Startup Scripts, Command History, Command Execution Process.

**KORN SHELL PROGRAMMING:** Basic Script concepts, Expressions, Decisions: Making Selections, Repetition, special Parameters and Variables, changing Positional Parameters, Argument Validation, Debugging Scripts, Script Examples.

#### UNIT -VII

**INTERACTIVE C SHELL:** C shell features, Two Special Files, Variables, Output, Input, Exit Status of a Command, eval Command, Environmental Variables, On-Off Variables, Startup and Shutdown Scripts, Command History, Command Execution Scripts.

**C SHELL PROGRAMMING:** Basic Script concepts, Expressions, Decisions: Making Selections, Repetition, special Parameters and Variables, changing Positional Parameters, Argument Validation, Debugging Scripts, Script Examples.

## UNIT -VIII

**FILE MANAGEMENT:** File Structures, System Calls for File Management – create, open, close, read, write, lseek, link, symlink, unlink, stat, fstat, lstat, chmod, chown, Directory API – opendir, readdir, closedir, mkdir, rmdir, umask.

### TEXT BOOKS:

1. Behrouz A. Forouzan, Richard F. Gilbery, “Unix and Shell Programming”, 1<sup>st</sup> Edition, Cengage Learning India, 2008.
2. Sumitabha Das, “Your Unix the Ultimate Guide”, 2<sup>nd</sup> Edition. TMH, 2010.

### REFERENCES:

1. Graham Glass, King Ables, “Unix for Programmers and Users”, 3<sup>rd</sup> edition, Pearson Education, 2009.
2. Brain W.Kernighan, Rob Pike, “Unix programming Environment”, 1<sup>st</sup> Edition, PHI. Learning Private Limited, Pearson Education, 2009.
3. Kenneth Rosen, Host, Klee, Farber, Rosinski, “The Complete Reference Unix”, 2<sup>nd</sup> Edition, TMH, 2007.
4. Yashwanth Kanitkar, “Unix Shell Programming”, 1<sup>st</sup> Edition, BPB Publisher, 2010.



## OPERATING SYSTEMS

**Course Code:ACT1108**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>1</b>	<b>0</b>	<b>4</b>

### **AIM:**

Gives the idea about the CPU scheduling and memory scheduling and how they implemented using respective algorithms.

### **OBJECTIVE:**

Student may have the idea about resource sharing, multitasking, multiprocessing etc.

### **UNIT-I**

Computer System and Operating System Overview: Overview of computer operating systems operating systems functions protection and security distributed systems special purpose systems operating systems structures and systems calls operating systems generation.

### **UNIT-II**

Process Management – Process concepts threads, scheduling-criteria algorithms, their evaluation, Thread scheduling, case studies UNIX, Linux, Windows.

### **UNIT-III**

**CONCURRENCY:** Process synchronization, the critical- section problem, Peterson’s Solution, synchronization Hardware, semaphores, classic problems of synchronization, monitors, Synchronization examples, atomic ransactions. Case studies UNIX, Linux, Windows.

### **UNIT-IV**

**MEMORY MANAGEMENT:** Swapping, contiguous memory allocation, paging, structure of the page table ,segmentation, virtual memory, demand paging, page-Replacement algorithms, case studies UNIX, Linux, Windows.

## UNIT-V

Principles of deadlock – system model, deadlock characterization, deadlock prevention, detection and Avoidance, recovery form deadlock, I/O systems, Hardware, application interface, kernel I/O subsystem, Transforming I/O requests Hardware operation, STREAMS, performance.

## UNIT-VI

File system Interface - the concept of a file, Access Methods, Directory structure, File system mounting, file sharing, protection.

File System implementation- File system structure, file system implementation, directory implementation, directory implementation, allocation methods, free-space management, efficiency and performance, case studies. UNIX, Linux, Windows.

## UNIT-VII

Mass-storage structure overview of Mass-storage structure, Disk structure, disk attachment disk scheduling, swap-space management, RAID structure, stable-storage implementation, Tertiary storage structure.

## UNIT-VIII

**PROTECTION:** Protection, Goals of Protection, Principles of Protection, Domain of protection Access Matrix, Implementation of Access Matrix, Access control, Revocation of Access Rights, Capability- Based systems, Language – Based Protection,

Security- The Security problem, program threats, system and network threats cryptography as a security tool, user authentication, implementing security defenses, firewalling to protect systems and networks, computer –security classifications, case studies UNIX, Linux, Windows

## TEXT BOOKS:

1. Abraham Silberchatz, Peter B. Galvin, Greg Gagne, “Operating System Concepts”, 7<sup>th</sup> Edition, John Wiley & Sons, 2006.
2. D.M.Dhamdhare, “Operating systems - A Concept Based Approach”, 2<sup>nd</sup> Edition, TMH, 2010.

**REFERENCES:**

1. William Stallings, “Operating Systems’ – Internal and Design Principles”, 6<sup>th</sup> Edition, Pearson education/PHI, 2009.
2. Charles Crowley, “Operating Systems - A Design Approach”, 1<sup>st</sup> Edition, TMH, 2009.
3. Andrew S Tanenbaum, “Modern Operating Systems”, 3<sup>rd</sup> Edition Pearson, PHI, 2008.





## DATABASE MANAGEMENT SYSTEMS

**Course Code:ACT1109**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>1</b>	<b>0</b>	<b>4</b>

### **AIM:**

To make the student confident in maintaining huge amount of data by creating tables, and accessing them.

### **OBJECTIVE:**

Student can get the capability of maintenance of huge amount of data along with reducing of redundancy in data.

### **UNIT-I**

Data base System Applications, data base System VS file System – View of Data – Data Abstraction – Instances and Schemas – data Models – the ER Model – Relational Model – Other Models – Database Languages – DDL – DML – database Access for applications Programs – data base Users and Administrator – Transaction Management – data base System Structure – Storage Manager – the Query Processor

### **UNIT-II**

History of Data base Systems, Data base design and ER diagrams – Beyond ER Design Entities, Attributes and Entity sets – Relationships and Relationship sets – Additional features of ER Model – Concept Design with the ER Model – Conceptual Design for Large enterprises.

### **UNIT-III**

Introduction to the Relational Model – Integrity Constraint Over relations – Enforcing Integrity constraints – Querying relational data – Logical data base Design – Introduction to Views – Destroying /altering Tables and Views, Relational Algebra – Selection and projection set operations – renaming – Joins – Division – Examples of Relational Algebra Relational calculus – Tuple relational Calculus – Domain relational calculus – Expressive Power of Algebra and calculus.

## UNIT-IV

Form of Basic SQL Query – Examples of Basic SQL Queries – Introduction to Nested Queries – Correlated Nested Queries Set – Comparison Operators – Aggregative Operators – NULL values – Comparison using Null values – Logical connectivity's – AND, OR and NOT – Impact on SQL Constructs – Outer Joins – Disallowing NULL values – Complex Integrity Constraints in SQL Triggers and Active Data bases.

## UNIT-V

Schema refinement – Problems Caused by redundancy – Decompositions – Problem related to decomposition – reasoning about FDS – FIRST, SECOND, THIRD Normal forms – BCNF – Lossless join Decomposition – Dependency preserving Decomposition – Schema refinement in Data base Design – Multi valued Dependencies – FORTH Normal Form.

## UNIT-VI

Transaction Concept- Transaction State- Implementation of Atomicity and Durability – Concurrent – Executions – Serializability- Recoverability – Implementation of Isolation – Testing for serializability- Lock – Based Protocols – Timestamp Based Protocols- Validation- Based Protocols – Multiple Granularity.

## UNIT-VII

Recovery and Atomicity – Log – Based Recovery – Recovery with Concurrent Transactions – Buffer Management – Failure with loss of nonvolatile storage-Advance Recovery systems- Remote Backup systems.

## UNIT-VIII

Data on External Storage – File Organization and Indexing – Cluster Indexes, Primary and Secondary Indexes – Index data Structures – Hash Based Indexing – Tree base Indexing – Comparison of File Organizations – Indexes and Performance Tuning- Intuitions for tree Indexes – Indexed Sequential Access Methods (ISAM) – B+ Trees: A Dynamic Index Structure.

---

**TEXT BOOKS:**

1. Raghurama Krishnan, Johannes Gehrke, “Data base Management Systems”, 3<sup>rd</sup> Edition, TATA McGrawHill, 2008.
2. Silberschatz, Korth, “Data Base System Concepts”, 5<sup>th</sup> Edition, McGraw Hill, 2010.

**REFERENCES:**

1. Peter Rob & Carlos Coronel, “Data base Systems design, Implementation, and Management”, 7<sup>th</sup> Edition, Pearson Education, 2000.
2. Elmasri Navrate, “Fundamentals of Database Systems”, 5<sup>th</sup> Edition, Pearson Education, 2007.
3. C.J.Date, “Introduction to Database Systems”, 7<sup>th</sup> Edition, Pearson Education, 2002.



## OBJECT ORIENTED PROGRAMMING THROUGH JAVA

Course Code:ACT1110

L	T	P	C
4	1	0	4

### AIM:

To make the student confident in object oriented programming and also in developing network, and multi threaded user interface programs.

### OBJECTIVE:

Student will get the capability of developing applications using GUI with the help of JAVA concepts.

### UNIT-I

Object oriented thinking :- Need for oop paradigm, A way of viewing world – Agents, responsibility, messages, methods, classes and instances, class hierarchies (Inheritance), method binding, overriding and exceptions, summary of oop concepts, coping with complexity, abstraction mechanisms.

### UNIT-II

Java Basics History of Java, Java buzzwords, data types, variables, scope and life time of variables, arrays, operators, expressions, control statements, type conversion and costing, simple java program, classes and objects – concepts of classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion, string handling.

### UNIT-III

Inheritance – Hierarchical abstractions, Base class object, subclass, subtype, substitutability, forms of inheritance- specialization, specification, construction, extension, limitation, combination, benefits of inheritance, costs of inheritance. Member access rules, super uses, using final with inheritance, polymorphism- method overriding, abstract classes.

## UNIT-IV

**PACKAGES AND INTERFACES:** Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages, differences between classes and interfaces, defining an interface, implementing interface, applying interfaces, variables in interface and extending interfaces, Exploring packages java .io ( Character streams, Byte streams), Files, Directories, randomaccessfiles), java.util (collections (vectors, hashmap, treemap, lists, sets,)), calendar, regex(pattern matching), date, scanner)

## UNIT -V

**EXCEPTION HANDLING AND MULTITHREADING:** Concepts of exception handling, benefits of exception handling, Termination or resumptive models, exception hierarchy, usage of try, catch, throw, throws and finally, built in exceptions, creating own exception sub classes. Differences between multi threading and multitasking, thread life cycle, creating threads, synchronizing threads, daemon threads, thread groups.

## UNIT -VI

**EVENT HANDLING :** Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes, inner classes. The AWT class hierarchy, user interface components- labels, button, canvas, scrollbars, text components, check box, check box groups, choices, lists panels – scrollpane, dialogs, menubar, graphics, layout manager – layout manager types – boarder, grid, flow, card and grib bag.

## UNIT -VII

**APPLETS:** Concepts of Applets, differences between applets and applications, life cycle of an applet, types of applets, creating applets, passing parameters to applets.

**SWING:** Introduction, limitations of AWT, MVC architecture, components, containers, exploring swing- JApplet, JFrame and JComponent, Icons and Labels, text fields, buttons – The JButton class, Check boxes, Radio buttons, Combo boxes, Tabbed Panes, Scroll Panes, Trees, and Tables.

## UNIT -VIII

**NETWORKING:** Basics of network programming, addresses, ports, sockets, simple client server program, multiple clients, Java .net package.

### TEXT BOOKS:

1. Herbert schildt, “Java the Complete Reference”, 7<sup>th</sup> Editon, TMH, 2010.
2. T. Budd, “An Introduction to OOP”, 3<sup>rd</sup> Edition, Pearson Education, 2009.

### REFERENCES:

1. J.Nino and F.A. Hosch, “An Introduction to Programming and OO design using Java”, 1<sup>st</sup> Edition, John Wiley & Sons, 2002
2. Y. Daniel Liang, “Introduction to Java Programming”, 7<sup>th</sup> Edition, Pearson Education, 2010.
3. R.A. Johnson, “An introduction to Java Programming and Object Oriented Application Development”, 1<sup>st</sup> Edition, Course Technology, 2009.
4. Cay.S.Horstmann and Gary Cornell, “Core Java 2 Fundamentals”, Vol 1, 8<sup>th</sup> Edition, Pearson Education, 2008.
5. Cay.S.Horstmann and Gary Cornell, “Core Java 2 Fundamentals”, Vol 2, 8<sup>th</sup> Edition, Pearson Education, 2008.
6. P. Radha Krishna, “Object Oriented Programming through Java”, 1<sup>st</sup> Edition, University Press, 2008.
7. Iver Horton, “Beginning in Java 2 JDK”, 5<sup>th</sup> edition, Wrox Publications, 2009.



## PRINCIPLES OF PROGRAMMING LANGUAGES

**Course Code: ACS1101**

L	T	P	C
4	0	0	4

### **AIM:**

To study the features of various programming languages.

### **OBJECTIVE:**

To enable the students to learn about various constructs and their respective comparisons in different high-level languages so that he can choose suitable programming language for solving a particular problem.

### **UNIT -I**

**PRELIMINARY CONCEPTS:** Reasons for studying, concepts of programming languages, Programming domains, Language Evaluation Criteria, influences on Language design, Language categories, Programming Paradigms – Imperative, Object Oriented, functional Programming, Logic Programming. Programming Language Implementation – Compilation and Virtual Machines, programming environments.

### **UNIT -II**

**SYNTAX AND SEMANTICS:** General Problem of describing Syntax and Semantics, formal methods of describing syntax - BNF, EBNF for common programming languages features, parse trees, ambiguous grammars, attribute grammars, denotational semantics and axiomatic semantics for common programming language features.

### **UNIT -III**

**DATA TYPES:** Introduction, primitive, character, user defined, array, associative, record, union, pointer and reference types, design and implementation uses related to these types. Names, Variable, concept of binding, type checking, strong typing, type compatibility, named constants, variable initialization.

## UNIT -IV

**EXPRESSIONS AND STATEMENTS:** Arithmetic relational and Boolean expressions, Short circuit evaluation mixed mode assignment, Assignment Statements, Control Structures – Statement Level, Compound Statements, Selection, Iteration, Unconditional Statements, guarded commands.

## UNIT-V

**SUBPROGRAMS AND BLOCKS:** Fundamentals of sub-programs, Scope and lifetime of variable, static and dynamic scope, Design issues of subprograms and operations, local referencing environments, parameter passing methods, overloaded sub-programs, generic sub-programs, parameters that are sub-program names, design issues for functions user defined overloaded operators, co routines

## UNIT -VI

**ABSTRACT DATA TYPES:** Abstractions and encapsulation, introductions to data abstraction, design issues, language examples, C++ parameterized ADT, object oriented programming in small talk, C++, Java, C#, Ada 95

Concurrency: Subprogram level concurrency, semaphores, monitors, message passing, Java threads, C# threads.

## UNIT -VII

Exception handling:

Exceptions, exception Propagation, Exception handler in Ada, C++ and Java.

Logic Programming Language:

Introduction and overview of logic programming, basic elements of prolog, application of logic programming.

## UNIT -VIII

**FUNCTIONAL PROGRAMMING LANGUAGES:** Introduction, fundamentals of FPL, LISP, ML, Haskell, application of Functional Programming Languages and comparison of functional and imperative Languages.



---

**TEXT BOOKS :**

1. Robert .W. Sebesta, “Concepts of Programming Languages”, 6<sup>th</sup> Edition, Pearson Education.
2. Louden, “Programming Languages”, Second Edition, Thomson.

**REFERENCES:**

1. Ghezzi, “Programming languages, 3<sup>rd</sup> Edition, John Wiley
2. Pratt and Zelkowitz, “Programming Languages Design and Implementation”, Fourth Edition PHI/Pearson Education
3. Watt, Wiley Dreamtech, “Programming languages”
4. LISP Patric Henry Winston and Paul Horn Pearson Education.
5. Programming in PROLOG Clocksin, Springer.



## COMPUTER NETWORKS

**Course Code: ACT1130**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>1</b>	<b>0</b>	<b>4</b>

### **AIM:**

To teach the fundamentals of connectivity and communication of computers.

### **OBJECTIVE:**

To give exposure on different issues involved in setting up different types of networks of computers.

### **UNIT - I**

**INTRODUCTION:** OSI, TCP/IP and other networks models, Examples of Networks: Arpanet, Internet, Network Topologies WAN, LAN, MAN, Networking equipment, Switches, hubs, routers, gateways)

### **UNIT - II**

**PHYSICAL LAYER:** Transmission media copper, twisted pair wireless, switching and encoding, asynchronous communications; ATM, Optical fiber, Encoding and decoding

### **UNIT - III**

**DATA LINK LAYER:** Design issues, framing, error detection and correction, CRC, Elementary Protocol-stop and wait, Sliding Window, Slip, Data link layer , HDLC, Data link layer in Internet.

### **UNIT - IV**

**MEDIUM ACCESS SUB LAYER:** ALOHA, MAC addresses, Carrier sense multiple access. IEEE 802.X Standard Ethernet, wireless LANS. Bridges

### **UNIT - V**

**NETWORK LAYER:** Virtual circuit and Datagram subnets-Routing algorithm shortest path routing, flooding, Hierarchical routing, Broad cast, Multi cast, distance vector routing, Introduction to IP V6.

## UNIT – VI

**DYNAMIC ROUTING:** Broadcast routing, Routing for mobility, Congestion, Control Algorithms – General Principles – of Congestion prevention policies. Internet working: The Network layer in the internet, ATM network protocols, IP over ATM.

## UNIT –VII

**TRANSPORT LAYER:** Transport Services, Connection management, TCP and UDP protocols; ATM AAL Layer Protocol.(topics of Tanumbam)

## UNIT – VIII

**APPLICATION LAYER:** Domain name system, SNMP, Electronic Mail; the World WEB, Multi Media,

## TEXT BOOKS:

1. Andrew S Tanenbaum, “Computer Networks”, 4<sup>th</sup> Edition. Pearson Education/PHI
2. Behrouz A. Forouzan, “Data Communications and Networking”, 3<sup>rd</sup> Edition TMH.
3. S.Keshav, “An Engineering Approach to Computer Networks”, 2<sup>nd</sup> Edition, Pearson Education

## REFERENCES:

1. W.A. Shay, “Understanding communications and Networks”, 3<sup>rd</sup> Edition, Thomson
2. Douglas E Comer, “Computer networks and Internets”, 4<sup>th</sup> Edition, Pearson Education
3. Douglas E Comer, David L.Stevens, “Internetworking with TCP/IP”, 3<sup>rd</sup> Edition.



## OPERATING SYSTEM LAB

**Course Code: ACT1111**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>3</b>	<b>2</b>

### AIM:

To provide necessary operating system concepts like Disk scheduling paging, deadlock avoidance and concurrency techniques.

### OBJECTIVE:

- ◆ To provide an understanding of the design aspects of operating system

Recommended Systems/Software Requirements:

- ◆ Intel based desktop PC with minimum of 166 MHZ or faster processor with atleast 64 MB RAM and 100 MB free disk space JDK kit

### Part – A

1. Simulate the following unix commands:
  - a) mv                      b) cp                      c) ls                      (Use system calls)
2. Simulate the following CPU scheduling algorithms
  - a) Round Robin b) SJF                      c) FCFS d) Priority
3. Simulate all file allocation strategies
  - a) Sequential    b) Indexed                      c) Linked
4. Simulate Bankers Algorithm for Dead Lock Avoidance
5. Simulate Bankers Algorithm for Dead Lock Prevention
6. Simulate all page replacement algorithms
  - a) FIFO                      b) LRU                      c) LFU

## Part – B

### 1. (USING JAVA.MATH CLASS)

- a) Write a Java program that prints all real solutions to the quadratic equation  $ax^2 + bx + c = 0$ . Read in a,b, c and use the quadratic formula. If the discriminant  $b^2-4ac$  is negative, display a message stating that there are no real solutions.
  - b) The Fibonacci sequence is defined by the following rule: The first two values in the sequence are 1 and 1. Every subsequent value is the sum of the two values preceding it. Write a Java program that uses both recursive and non recursive functions to print the nth value in the Fibonacci sequence.
2.
    - a) Write a Java program that prompts the user for an integer and then prints out all prime numbers up to that integer.
    - b) Write a Java program to multiply two given matrices.
    - c) Write a Java Program that reads a line of integers, and then displays each integer, and the sum of all the integers (Use StringTokenizer class of java.util)

### 3. (USING JAVA.LANG.FILEINPUTSTREAM AND FILE OUTPUT STREAM)

- a) Write a Java program that reads a file name from the user, then displays information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file in bytes.
- b) Write a Java program that reads a file and displays the file on the screen, with a line number before each line.
- c) Write a Java program that displays the number of characters, lines and words in a text file.

### 4. WRITE A JAVA PROGRAM THAT:

- a. Implements stack ADT.
- b. Converts infix expression into Postfix form
- c. Evaluates the postfix expression

5. **(PACKAGES):** Design a package to contain the class Student that contains data members such as name, roll number and another package contains the interface Sports which contains some sports information. Import these two packages in a package called Report which process both Student and Sport and give the report.
6. a) Write a java program to create an abstract class named Shape that contains an empty method named numberOfSides (). Provide three classes named Trapezoid, Triangle and Hexagon such that each one of the classes extends the class Shape. Each one of the classes contains only the method numberOfSides () that shows the number of sides in the given geometrical figures.
- b) Write a Java program that checks whether a given string is a palindrome or not. Ex: MADAM is a palindrome.
- c) Write a Java program for sorting a given list of names in ascending order.
7. **(EXCEPTION HANDLING AND MULTITHREADING)**
- a). Write a program that reads two numbers from the user to perform integer division into Num1 and Num2 variables. The division of Num1 and Num2 is displayed if they are integers. If Num1 or Num2 were not an integer, the program would throw a NumberFormatException. If Num2 were Zero, the program would throw an ArithmeticException.
- b). Create a user defined exception.
- c). Write a Java program that correctly implements producer consumer problem using the concept of multithreading.
8. **(USING JAVA.AWT,\*)**
- a). Write a java program that simulates a traffic light. The program lets the user select one of three lights: red, yellow, or green. When a radio button is selected, the light is turned on, and only one light can be on at a time No light is on when the program starts.

- b). Write an applet program that simulates a digital clock.

## 9. (APPLETS AND EVENTHANDLING)

- a) Develop an applet that displays a simple message.
- b) Develop an applet that receives an integer in one text field, and computes its factorial Value and returns it in another text field, when the button named “Compute” is clicked.
- c) Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -, \*, % operations. Add a text field to display the result.

## 10. (SWINGS AND EVENT HANDLING)

- a). Suppose that a table named Table.txt is stored in a text file. The first line in the file is the header, and the remaining lines correspond to rows in the table. The elements are separated by commas. Write a java program to display the table using Jtable component.
- b). Write a Java program for handling mouse events.

## 11. (SOCKET PROGRAMMING)

Write a Java program that implements a simple client/server application. The client sends data to a server. The server receives the data, uses it to produce a result, and then sends the result back to the client. The client displays the result on the console. For ex: The data sent from the client is the radius of a circle, and the result produced by the server is the area of the circle. (Use java.net)



## DATABASE MANAGEMENT SYSTEMS LAB

**Course Code: ACT1112**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>3</b>	<b>2</b>

### AIM:

To teach the student logical database design and querying the database using SQL & PL/SQL.

### OBJECTIVE:

Student will get knowledge of creating and maintaining tables of a database using SQL, handling all types of Queries, and writing all kinds of programming scripts in PL/SQL, transaction managements, creation of stored procedures, functions, cursors & triggers.

### RECOMMENDED SYSTEMS/SOFTWARE REQUIREMENTS:

♣ Intel based desktop PC

♣ Mysql /Oracle latest version Recommended

- 1) Creation, altering and dropping of tables and inserting rows into a table (use constraints while creating tables) examples using SELECT command.
- 2) Queries (along with sub Queries) using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION, INTERSET, Constraints.  
Example:- Select the roll number and name of the student who secured fourth rank in the class.
- 3) Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.
- 4) Queries using Conversion functions (to\_char, to\_number and to\_date), string functions (Concatenation, lpad, rpad, ltrim, rtrim, lower, upper, initcap, length, substr and instr), date functions



(Sysdate, next\_day, add\_months, last\_day, months\_between, least, greatest, trunc, round, to\_char, to\_date)

- 5)
  - i) Creation of simple PL/SQL program which includes declaration section, executable section and exception – Handling section (Ex. Student marks can be selected from the table and printed for those who secured first class and an exception can be raised if no records were found)
  - ii) Insert data into student table and use COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block.
- 6) Develop a program that includes the features NESTED IF, CASE and CASE expression. The program can be extended using the NULLIF and COALESCE functions.
- 7) Program development using WHILE LOOPS, numeric FOR LOOPS, nested loops using ERROR Handling, BUILT –IN Exceptions, user defined Exceptions, RAISE- APPLICATION ERROR.
- 8) Programs development using creation of procedures, passing parameters IN and OUT of PROCEDURES.
- 9) Program development using creation of stored functions, invoke functions in SQL Statements and write complex functions.
- 10) Program development using creation of package specification, package bodies, private objects, package variables and cursors and calling stored packages.
- 11) Develop programs using features parameters in a CURSOR, FOR UPDATE CURSOR, WHERE CURRENT of clause and CURSOR variables.
- 12) Develop Programs using BEFORE and AFTER Triggers, Row and Statement Triggers and INSTEAD OF Triggers

**TEXT BOOKS :**

- 1). ORACLE PL/SQL by example. Benjamin Rosenzweig, Elena Silvestrova, Pearson education 3rd Edition
- 2). ORACLE DATA BASE LOG PL/SQL Programming SCOTT URMAN, Tata Mc-Graw Hill.
- 3). SQL & PL/SQL for Oracle 10g, Black Book, Dr.P.S. Deshpande.



---

---

***SYLLABI FOR V SEMESTER***

---

---



## COMPUTER GRAPHICS

**Course Code: ACT1113**

L	T	P	C
4	0	0	4

### AIM:

To familiarise the student with concepts of computer graphics.

### OBJECTIVE:

To acquaint the student with transformations and various algorithms of computer graphics.

### UNIT-I

Introduction, Application areas of Computer Graphics, overview of graphics systems, video-display devices, raster-scan systems, random scan systems, graphics monitors and work stations and input devices.

### UNIT-II

**OUTPUT PRIMITIVES** : Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms

### UNIT-III

**2-D GEOMETRICAL TRANSFORMS** : Translation, scaling, rotation, reflection and shear transformations, matrix geneous coordinates, composite transforms, transformations between coordinate systems.

### UNIT-IV

**2-D VIEWING** : The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland –Hodgeman polygon clipping algorithm

### UNIT-V

**3-D OBJECT REPRESENTATION** : Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and B-Spline surfaces. Basic illumination models, polygon rendering methods.

## UNIT-VI

**3-D GEOMETRIC TRANSFORMATIONS :** Translation, rotation, scaling, reflection and shear transformations, composite transformations.

**3-D VIEWING:** Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping.

## UNIT-VII

**VISIBLE SURFACE DETECTION METHODS :** Classification, back-face detection, depth-buffer, scan-line, depth sorting, BSP-tree methods, area sub-division and octree methods

## UNIT-VIII

**COMPUTER ANIMATION:** Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame systems, motion specifications.

### TEXT BOOKS:

1. Donald Hearn and M.Pauline Baker :Computer Graphics C version, 1<sup>st</sup> Edition Pearson Education, 2009.
2. Foley, VanDam, Feiner and Hughes : Computer Graphics Principles & practice, 2<sup>nd</sup> Edition, Pearson Education, 2009.

### REFERENCES:

1. Donald Hearn and M.Pauline Baker, “Computer Graphics”, 2<sup>nd</sup> Edition, PHI/Pearson Education, 2008.
2. Zhigand xiang, Roy Plastock, “Computer Graphics-Schaum’s outlines”, 2<sup>nd</sup> Edition, Tata Mc- Graw Hill Edition, 2007.
3. David F Rogers, “Procedural elements for Computer Graphics”, 2<sup>nd</sup> Edition, Tata Mc Graw Hill, 2008.
4. Neuman and Sproul, “Principles of Interactive Computer Graphics”, 2<sup>nd</sup> Edition, TMH, 2008.
5. Shalini Govil, Pai, “Principles of Computer Graphics”, Springer International Edition, 2005.
6. Steven Harrington, “Computer Graphics - A Programming Approach”, 1<sup>st</sup> Edition TMH, 2010.



## FORMAL LANGUAGES AND AUTOMATA THEORY

**Course Code: ACT1114**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>1</b>	<b>0</b>	<b>4</b>

### AIM:

The purpose of this course is to acquaint the student with an overview of the theoretical foundations of computer science from the perspective of formal languages

### OBJECTIVE:

- Explain deterministic and non-deterministic machines.
- Comprehend the hierarchy of problems arising in the computer sciences.

### UNIT-I

**FUNDAMENTALS :** Basic concepts, Formal languages, Strings, Alphabet, Language, Operations, Finite state machine, definitions, finite automaton model, acceptance of strings, and languages, deterministic finite automaton and non deterministic finite automaton, transition diagrams and Language recognizers.(proof's not required).

### UNIT-II

**FINITE AUTOMATA:** NFA with  $\epsilon$ -transitions - Significance, acceptance of languages. Conversions and Equivalence : Equivalence between NFA with and without  $\epsilon$ -transitions, NFA to DFA conversion, minimisation of FSM, equivalence between two FSM's, Finite Automata with output-Moore and Melay machines.

### UNIT-III

**REGULAR LANGUAGES :** Regular sets, regular expressions, identity rules, Constructing finite Automata for a given regular expressions, Conversion of Finite Automata to Regular expressions. Pumping lemma of regular sets, closure properties of regular sets (proofs not required).

## UNIT-IV

**GRAMMAR FORMALISM :** Regular grammars-right linear and left linear grammars, equivalence between regular linear grammar and FA, inter conversion, Context free grammar, derivation trees, sentential forms. Right most and leftmost derivation of strings.

## UNIT-V

**CONTEXT FREE GRAMMARS :** Ambiguity in context free grammars. Minimisation of Context Free Grammars. Chomsky normal form, Greibach normal form, Pumping Lemma for Context Free Languages. Enumeration of properties of CFL (proofs omitted).

## UNIT-VI

**PUSH DOWN AUTOMATA :** Push down automata, definition, model, acceptance of CFL, Acceptance by final state and acceptance by empty state and its equivalence. Equivalence of CFL and PDA, interconversion. (Proofs not required). Introduction to DCFL and DPDA.

## UNIT-VII

**TURING MACHINE:** Turing Machine, definition, model, design of TM, Computable functions, recursively enumerable languages. Church's hypothesis, counter machine, types of Turing machines (proofs not required).

## UNIT-VIII

**COMPUTABILITY THEORY :** Chomsky hierarchy of languages, linear bounded automata and context sensitive language, decidability of problems, Universal Turing Machine, Post's Correspondence problem, Turing reducibility, graph theory introduction.

## TEXT BOOKS:

1. Hopcroft H.E. and Ullman J. D, "Introduction to Automata Theory Languages and Computation", 3<sup>rd</sup> Edition, Pearson Education, 2002. ( Units: 1 to 8 )



## REFERENCES:

1. Daniel I.A. Cohen, “Introduction to Computer Theory”, 2<sup>nd</sup> edition, John Wiley Publication, 2000
2. Mishra and Chandrashekar, “Theory of Computer Science – Automata Languages and Computation”, 3<sup>rd</sup> Edition, PHI,2007.
3. John C Martin, “Introduction to Languages and the Theory of Computation”, 3<sup>rd</sup> Edition, TMH ,2007.
4. Sipser, “Introduction to Theory of Computation”, 2<sup>nd</sup> Edition, Thomson,2007
5. J.E.Hopcraft and JefferyD.Ulman, “Introduction to Automata Theory, Languages & Computation”, 2<sup>nd</sup> Edition, Narosa Publishing Company, 2003.
6. Sunitha, “Formal Languages and Automata Theory”, 1<sup>st</sup> Edition, TMH, 2010.
7. kumar, “Theory of Automata Languages and Computations”, 1<sup>st</sup> Edition, TMH, 2010.

## WEB REFERENCES:

<http://www.nptel.iitm.ac.in/courses/Webcourse-contents/IIT-%20Guwahati/afl/index.htm>



## ARTIFICIAL INTELLIGENCE

**Course Code: ACT1131**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>

### **AIM:**

To become acquainted with the various aspects of AI.

### **OBJECTIVE:**

To understand various concepts of AI such as searching, knowledge representation, logic, planning, uncertainty, probabilistic reasoning, learning.

### **UNIT-I**

**INTRODUCTION:** AI problems, foundation of AI and history of intelligent agents: Agents and Environments, the concept of rationality, the nature of environments, structure of agents, problem solving agents, problem formulation.

### **UNIT-II**

**SEARCHING:** Searching for solutions, uninformed search strategies- Breadth first search, depth first search, Search with partial information (Heuristic search) Greedy best first search , A\*search. Game Playing: Adversarial search, Games, minimax algorithm, optimal decisions in multiplayer games, Alpha Beta pruning, Evaluation functions, cutting of search.

### **UNIT-III**

Knowledge Representation, Knowledge Based agents, the Wumpus world, logic, propositional logic, Resolution patterns in propositional logic, Resolution, Forward and Backward chaining.

### **UNIT-IV**

First order logic. Inference in first order logic, propositional vs first order inference, unification and lifts, forward chaining, backward chaining, resolution

## UNIT-V

**PLANNING :** Classical planning problem, Language of planning problems, Expressiveness and extension, planning with state-space search, Forward state space search, Backward state space search, Heuristics for state space search. Planning search, planning with state space search, partial order planning graphs.

## UNIT-VI

**UNCERTAINTY :** Acting under uncertainty, Basic probability notation, axioms of probability, Inference using Full joint distributions, Baye's Rule and its use. Probabilistic Reasoning: Representing knowledge in an uncertain domain, the semantics of Bayesian Networks, Efficient representation of conditional distributions. Exact inference in Bayesian networks.

## UNIT-VII

**PROBABILISTIC REASONING OVER TIME:** Time and Uncertainty, Inference in Temporal models, Hidden Markov models, Kalman Filters, Dynamic Bayesian Networks, Speech Recognition.

## UNIT-VIII

**LEARNING :** Forms of learning, Induction learning, Learning Decision trees, statistical learning methods, learning with complex data, learning with hidden variables-the EM algorithm, instance based learning, neural networks.

## TEXT BOOKS:

1. Stuart Russell, Peter Norvig, "Artificial Intelligence-A Modern Approach", 2<sup>nd</sup> Edition PHI/Pearson Education , 2003. ( Units: 1 to 8 )

## REFERENCE BOOKS:

1. Patrick Henry Winston, "Artificial Intelligence", 3<sup>rd</sup> Edition, Pearson Edition, 2001.
2. E.Rich and K.Knight, "Artificial Intelligence", 3<sup>rd</sup> Edition, TMH, 2008.

3. Patterson, “Artificial Intelligence and Expert Systems”, 2<sup>nd</sup> Edition, PHI, 2008.
4. Giarrantana/Riley, Thomson, “Expert systems-Principles and Programming”, 4<sup>th</sup> Edition, Thomson, 2007.
5. Ivan Bratika, “PROLOG Programming for Artificial Intelligence”, 3<sup>rd</sup> Edition, Pearson Education, 2003.

#### **WEB REFERENCE :**

[http://www.nptel.iitm.ac.in/courses/Webcourse-contents/IIT%20Kharagpur/Artificial%20intelligence/New\\_index1.html](http://www.nptel.iitm.ac.in/courses/Webcourse-contents/IIT%20Kharagpur/Artificial%20intelligence/New_index1.html)



## MICROPROCESSORS AND INTERFACING

**Course Code: ACT1115**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>1</b>	<b>0</b>	<b>4</b>

### **AIM:**

To give an exposure on different microprocessors and their programming.

### **OBJECTIVE:**

The student shall be able to learn features of different microprocessors, and programming and simulation in IDE. This syllabus focuses on processors with Harvard architecture with an efficient instruction set

### **UNIT-I**

Introduction to Classic 8051 family Architecture. Address and data bus with multiplexed I/O pins. Registers Examples with arithmetic and Boolean instruction set. Applications using Timers Counters and I/O programming for external logic sensing and control. Interrupts and its programming. This is an example of Von Neumann Architecture.

### **UNIT-II**

Introduction to Harvard architecture. Advantages of separate address and data busses providing faster and efficient programming. Built in Flash with two wire programming reducing CPU size. Provision of peripherals and flash ROM, EEPROM, and a large special function register work space for application oriented embedded systems.

Introduction to PIC family Architecture and instruction set. Introduction to the RISC instruction set and its usage with example programs using Integrated development environment MPLAB simulation.

### **UNIT-III:**

#### **PERIPHERAL SYSTEMS IN PIC 16F877A PROCESSOR.**

- Digital Input and Output Programming,
- Timers and Counters
- Capture Control and PWM

- (d) Analog to Digital Converters and their Programming
- (e) Simple data acquisition systems and programming.

#### **UNIT-IV**

Introduction to Atmega processor family architecture using typical Atmega 8535 processor. Features in the peripherals provided, Introduction to its large instruction set. Using IDU Atmel Studio for programming and simulation.

#### **UNIT-V**

### **PERIPHERAL SYSTEMS IN ATMEGA 8535**

- (a) Digital Input and Output Programming
- (b) Timers and Counters wave form generation.
- (c) Capture Control and PWM
- (d) Analog to Digital Converters and their Programming
- (e) Simple data acquisition programming.

#### **UNIT-VI**

### **SERIAL COMMUNICATION BUSES**

- (a) USART, with addressable feature
- (b) SPI bus
- (c) 12c two wire bus
- (d) Introduction to USB bus

#### **UNIT-VII**

Application design using an embedded system. Interrupts, and interrupt processing. Interrupt vectors, and their application programming. Interrupt processing in PIC and Atmega processor families. Interrupt latency. Processing multiple interrupts.

Logical steps to design a program to meet an objective. Examples in robotics, Motor control, display control, data acquisition etc. preferably with illustrative examples.

#### **UNIT-VIII**

Processor simulation and debugging using integrated development environment. The use of IDU gives a comprehensive glimpse of all

processor activities to enable the programmer to watch events. Such a program makes it easy to find errors in the program logic and correct it. A brief introduction to In-circuit debugging of an assembly level program.

### **TEXT BOOKS:**

1. Bendapudy Kanta Rao, “Embedded Systems”, Prentice Hall India, 1<sup>st</sup> Edition, 2011.

### **REFERENCES:**

1. Ajay V Deshmukh, “Microcontrollers”, 4<sup>th</sup> Edition, TMH, 2010.
2. Kenneth J Ayala, “The 8051 Micro Controller”, 3<sup>rd</sup> Edition, Thomson Publishers, 2009.
3. Raj Kamal, “Embedded Sytesms”, 2<sup>nd</sup> Edition, TMH, 2008.
4. Raj Kamal, “Microcontrollers”, 1<sup>st</sup> Edition, Pearson Education, 2009.
5. Ali Mazidi Mohammed Gillispie, Mazide Janice, “The 8051 Microcontroller and Embedded Systems”, 2<sup>nd</sup> Edition, Pearson Education, 2009.



## DESIGN AND ANALYSIS OF ALGORITHMS

Course Code:ACT1116

L	T	P	C
4	1	0	4

### AIM:

To make this student familiarise the student with design and analysis concepts of algorithms.

### OBJECTIVE:

To make this student acquainted with various analysis techniques and with various design techniques like divide and conquer, greedy method, back tracking etc.

### UNIT -I

**INTRODUCTION :** Algorithm, Psuedo code for expressing algorithms, Performance Analysis-Space complexity, Time complexity, Asymptotic Notation- Big oh notation, Omega notation, Theta notation and Little oh notation, Probabilistic analysis, Amortized analysis.

### UNIT-II

Disjoint Sets- disjoint set operations, union and find algorithms, spanning trees, connected components and biconnected components.

### UNIT-III

**DIVIDE AND CONQUER:** General method , applications-Binary search, Quick sort, Merge sort, Strassen's matrix multiplication.

### UNIT-IV

**GREEDY METHOD:** General method, applications-Job sequencing with dead lines, 0/1 knapsack problem, Minimum cost spanning trees, Single source shortest path problem.

### UNIT-V

**DYNAMIC PROGRAMMING:** General method, applications-Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem, All pairs shortest path problem, Travelling sales person problem, Reliability design.



## UNIT-VI

**BACKTRACKING:** General method, applications-n-queen problem, sum of subsets problem, graph coloring, Hamiltonian cycles.

## UNIT-VII

**BRANCH AND BOUND:** General method, applications - Travelling sales person problem, 0/1 knapsack problem- LC Branch and Bound solution, FIFO Branch and Bound solution.

## UNIT-VIII

**NP-HARD AND NP-COMPLETE PROBLEMS:** Basic concepts, non deterministic algorithms, NP - Hard and NPComplete classes, Cook's theorem.

## TEXT BOOKS:

1. Ellis Horowitz, Satraj Sahni and Rajasekharam, "Fundamentals of Computer Algorithms", 3<sup>rd</sup> Edition, PHI/, Pearson Education, 2009.
2. M.T.Goodrich and R.Tomassia, "Algorithm Design Foundations, Analysis and Internet examples", John Wiley and Sons, 2008.

## REFERENCES:

1. T.H.Cormen, C.E.Leiserson, R.L.Rivest and C.Stein, "Introduction to Algorithms", 3<sup>rd</sup> Edition, PHI/ Pearson Education, 2009.
2. R.C.T.Lee, S.S.Tseng, R.C.Chang and T.Tsai, "Introduction to Design and Analysis of Algorithms - A Strategic Approach", 2<sup>nd</sup> Edition, Tata Mc Graw Hill, 2009.
3. Allen Weiss, "Data Structures and Algorithm Analysis in C++", 2<sup>nd</sup> Edition, Pearson education, 2009.
4. Aho, Ullman and Hopcroft, "Design and Analysis of Algorithms", 3<sup>rd</sup> Edition, Pearson education, 2008.
5. Richard Johnson baugh and Marcus Schaefer, "Algorithms", 1st Edition, Pearson Education, 2007.



## SOFTWARE ENGINEERING

**Course Code: ACT1117**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>1</b>	<b>0</b>	<b>4</b>

### AIM :

- ❖ To provide an understanding of the various processes software engineers may employ in developing contemporary software systems
- ❖ To examine all phases of the software development life cycle, from initial planning through implementation and maintenance.
- ❖ To develop an understanding of the tools and techniques employed in contemporary software engineering.

### OBJECTIVE:

- ❖ To demonstrate the skills required to analyse, design, test and maintain software systems
- ❖ To demonstrate an appreciation of good practices in software engineering
- ❖ To demonstrate the application of software quality concepts

### UNIT-I

**INTRODUCTION TO SOFTWARE ENGINEERING:** The evolving role of software, Changing Nature of Software, Software myths.

**A GENERIC VIEW OF PROCESS:** Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), Process patterns, process assessment, personal and team process models.

### UNIT-II

**PROCESS MODELS:** The waterfall model, Incremental process models, Evolutionary process models, The Unified process.

**SOFTWARE REQUIREMENTS:** Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document.

### UNIT-III

**REQUIREMENTS ENGINEERING PROCESS:** Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.

**System models:** Context Models, Behavioral models, Data models, Object models, structured methods.

### UNIT-IV

**DESIGN ENGINEERING :** Design process and Design quality, Design concepts, the design model.

**CREATING AN ARCHITECTURAL DESIGN:** Software architecture, Data design, Architectural styles and patterns, Architectural Design.

### UNIT-V

**OBJECT-ORIENTED DESIGN :** Objects and object classes, An Object-Oriented design process, Design evolution.

**PERFORMING USER INTERFACE DESIGN:** Golden rules, User interface analysis and design, interface analysis, interface design steps, Design evaluation.

### UNIT-VI

**TESTING STRATEGIES :** A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging.

**PRODUCT METRICS :** Software Quality, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance.

### UNIT-VII

**METRICS FOR PROCESS AND PRODUCTS :** Software Measurement, Metrics for software quality.

**RISK MANAGEMENT :** Reactive vs. Proactive Risk strategies, software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM Plan.

## UNIT-VIII

**QUALITY MANAGEMENT:** Quality concepts, Software quality assurance, Software Reviews, Formal technical reviews, Statistical Software quality Assurance, Software reliability, The ISO 9000 quality standards.

### TEXT BOOKS:

1. Roger S. Pressman, “Software Engineering, A Practitioner’s Approach”, 7<sup>th</sup> Edition, TMH, 2008. ( Units : 1,4,6,7,8 )
2. Sommerville, “Software Engineering”, 7<sup>th</sup> Edition, Pearson Education, 2008.( Units : 2,3,5)

### REFERENCE BOOKS:

1. K.K. Agarwal & Yogesh Singh, “Software Engineering”, 3<sup>rd</sup> Edition, New Age International Publishers, 2008.
1. James F. Peters, Witold Pedrycz, “Software Engineering, an Engineering Approach”, 1<sup>st</sup> Edition, John Wiley Publications, 2007.
2. Shely Cashman Rosenblatt, “Systems Analysis and Design”, 1<sup>st</sup> Edition, Thomson Publications, 2010.
3. Waman S Jawadekar, “Software Engineering Principles and Practice”, 1<sup>st</sup> Edition, TMH, 2006.

### WEB REFERENCES:

[http://www.nptel.iitm.ac.in/courses/Webcourse-contents/IIT%20Kharagpur/Soft%20Engg/New\\_index1.html](http://www.nptel.iitm.ac.in/courses/Webcourse-contents/IIT%20Kharagpur/Soft%20Engg/New_index1.html)



## MICROPROCESSORS AND INTERFACING LAB

Course code: ACT1118

L	T	P	C
0	0	3	2

1. Exposure to Integrated development Environment, for the processors. What it is and how to simulate and run any Embedded program. All the exercises are first simulated and debugged using one of the IDE programs. The learning process becomes easy and rewarding for all students. Using these programs, the following exercises are suggested:

### 1. STUDY OF TYPICAL PROGRAMS:

- ❖ Multi precision Addition, Subtraction, and Multiplication.
  - ❖ Handling Fractional numbers
  - ❖ BCD-Binary Conversion examples
  - ❖ ASCII to BCD conversion
  - ❖ Binary to ASCII conversion
2. Input Output control programming. The advantage of Tristate ports in PIC and ATMEL processors. Individual pin control, and drive capability. Using the I/O the following programs are run:
    - ❖ Sensing external input signals.
    - ❖ Controlling the external switching, for DC motors, Steppers
    - ❖ Clock generation and timing using Timers ad Counters
    - ❖ Pulse width control,
    - ❖ Capture control of external events
  3. Analog to Digital Converters its programming usage in fast data acquisition. Use multiplexed analog channels and their configuration.. Learn about acquisition speed, interrupt driven data converting.

#### **4. PROGRAMMING USING BUILT IN TIMERS**

- ❖ As Event Timers
- ❖ As Counters
- ❖ Frequency Generation
- ❖ Simple programs to generate FSK

#### **5. CAPTURE CONTROL AND ITS APPLICATION EXAMPLES**

- ❖ Measurement of pulse width using I/O
- ❖ Measurement of Duty cycle, power factor etc
- ❖ Measurement of velocity or speed
- ❖ Sensing touch

#### **6. SERIAL COMMUNICATION METHODS**

- ❖ USART and its programming
- ❖ SPI bus and its programming

#### **7. WAVE FORM GENERATION USING PWM METHODS**

- ❖ Generation of Sine wave
- ❖ Generation of FSK



## ADVANCED COMMUNICATION SKILLS LAB

**CODE: AHE1103**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>3</b>	<b>2</b>

### INTRODUCTION

The introduction of English Language Lab is considered essential at III/ IV B.Tech year level. At this stage the students need to prepare themselves for their careers which may require them to listen to, read, speak and write in English both for their professional and interpersonal communication in the globalised context. This is an integrated theory and lab course to enable students use ‘good’ English and perform the following:

- Gathering ideas and information: organizing ideas relevantly and coherently.
- Engaging in debates.
- Participating in group discussions.
- Facing interviews.
- Writing project/research/technical reports
- Making oral presentations.
- Writing formal letters and essays.
- Transferring information from non-verbal to verbal texts and vice versa.
- Taking part in social and professional communication.

### Objectives:

The Lab focuses on using computer-aided multimedia instruction for language development to meet the following targets:

- To improve the students’ accuracy and fluency in English through a well-developed vocabulary, and enable them listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts.

- To enable them communicate their ideas relevantly and coherently in writing.

**TEXT BOOK: LANGUAGE IN USE (Upper-Intermediate)**  
*by Adrian Doff and Christopher Jones, Cambridge University Publications.*

### UNIT-I

- Reading and Listening comprehension – reading for facts, guessing meanings from context, scanning, skimming, inference, critical reading
- (Lesson 2: Communicating)

### UNIT-II

- Vocabulary building, Creativity & Innovation, Using Advertisements and Music, Case studies
- Decision-Making, Time Management, Positive Thinking
- (Lesson 4: Sports and Games, Lesson 8: In The Market-Place)

### UNIT-III

- Cross-Cultural Communication- Problems of Language, Lack of Language equivalency/difficulties in using English.
- Non-Verbal Communication across different Cultures.
- (Lesson 13: Right and Wrong)

### UNIT-IV

- Literary reviews- reviewing the choicest genres like science fiction, autobiographies, travelogues, modern poetry etc.

### UNIT-V

- Group Discussion – dynamics of group discussion , Lateral thinking, Brainstorming and Negotiation skills  
( Lesson 10: Life, the universe and everything & Lesson 16: World Affairs)

### UNIT-VI

- Resume writing – structure and presentation, planning, defining the career objective



- Interview Skills – concept and process, pre-interview planning, opening strategies, answering-strategies, interview through tele and video-conferencing

## UNIT-VII

- Writing essays for competitive examinations
- Media writing-writing headlines, analyzing newspaper articles
- Analytical writing

## UNIT-VIII

- Technical Report writing – Types of formats and styles, subject matter – organization, clarity, coherence and style, planning, data-collection, tools, analysis.- Progress and Project Reports.

## RECOMMENDED BOOKS:

### COMMUNICATIONS SKILLS

1. M. Ashraf Rizvi, “Effective Technical Communication”, Tata McGraw-Hill Publishing Company Ltd., 2005.
2. Bhanu Ranjan, “An Approach to Communication Skills”, DhanpatRai &Co, 2010.
3. Raymond V. Lesikar, Marie E. Flatley, “Basic Business Communication: Skills for Empowering The Internet Generation”, 11<sup>th</sup> Edition, Tata McGraw-Hill. 2006.
4. Stephen Bailey, “Academic Writing- A Practical guide for students”, Routledge Falmer, London & New York, 2004.
5. Dr A. Ramakrishna Rao, Dr G.Natanam & Prof S.A. Sankaranarayanan, “English Language Communication : A Reader cum Lab Manual”, Anuradha Publications, Chennai, 2006.
6. Dr. Shalini Verma, “Body Language- Your Success Mantra”, S. Chand, 2006.
7. Barron’s, “DELTA’s key to the Next Generation TOEFL Test: Advanced Skill Practice”, New Age International (P) Ltd., Publishers, New Delh, Books on TOEFL/GRE/GMAT/CAT, 2011.
8. “IELTS series with CDs”, CUP, 2010.

9. Daniel G. Riordan & Steven E. Pauley, “Technical Report Writing Today”, Biztantra Publishers, 2005.
10. Andrea J. Rutherford, “Basic Communication Skills for Technology”, 2nd Edition, Pearson Education, 2007.
11. Sunita Mishra & C. Muralikrishna, “Communication Skills for Engineers”, Pearson Education, 2007.
12. Jolene Gear & Robert Gear, “Cambridge Preparation for the TOEFL” Test, 2010.
13. Meenakshi Raman & Sangeeta Sharma, “Technical Communication”, OUP, 2010.
14. Nick Ceremilla & Elizabeth Lee, “Cambridge English for the Media”, CUP, 2010

### **GENERAL READING**

1. A Reader’s Digest Selection, “Classic Short Stories” (India Today group), 2004.
2. Saros Cowasjee, “More Stories from the Raj and After”, HarperCollins Publishers India, 1986.
3. Girish Karnad, “Hayavadana”, OUP 1976.
4. A.P.J. Abdul Kalam “Wings of Fire”, Universities Press, 1999.
5. Bernard Shaw, “Apple Cart/Arms and the Man”, Orient Longman, 2010.
6. Khalil Gibran, “The Prophet” - Rajapal & Sons, 2008.



---

---

***COURSE STRUCTURE &  
SYLLABI FOR VI SEMESTER***

---

---



## SOFTWARE TESTING METHODOLOGIES

**Course code: ACT1119**

L	T	P	C
4	1	0	4

### **Aim:**

To teach the different testing techniques that are used in testing a software.

### **Objective:**

To understand the Risk Management in software testing. To understand the testing planes and policies that are adopted for different fields like client/server computing, Data warehouse.

### **UNIT-I**

**CREATING AN ENVIRONMENT SUPPORTIVE OF SOFTWARE TESTING:** Minimizing Risks, Writing Policy for Software Testing, Economics of Testing, Building a structural Approach to Software Testing and Developing a Test Strategy.

**BUILDING THE SOFTWARE TESTING PROCESS:** Software Testing Guidelines, Workbench Concept, Customizing the Software Testing process, Process Preparation Checklist.

### **UNIT-II**

**OVERVIEW OF THE SOFTWARE TESTING PROCESS:** Advantages of Following Process, The Cost of Computer testing, The Seven-Step Software Testing Process, Workbench Skills.

**STEP 1: ORGANIZING FOR TESTING:** Objective, Workbench, Input, Do Procedures (Task 1-5), Check Procedures, Output.

### **UNIT-III**

**DEVELOPING THE TEST PLAN :** Overview, Objective, Concerns, Workbench, Input, Do Procedures (Task 1-6), Check Procedures, Output, and Guidelines.

## UNIT-IV

**VERIFICATION TESTING :** Overview, Objective, Concerns, Workbench, Input, Do Procedures (Task 1-3), check Procedures, Output, and Guidelines.

## UNIT-V

**VALIDATION TESTING:** Overview, Objective, Concerns, Workbench, Input, Do procedures (Task 1-3), Check Procedures, Output, Guidelines.

**ANALYZING AND REPORTING TEST RESULTS:** Overview, Concerns, Workbench, Input, Do Procedures (Task 1-3), Check Procedures, Output, Guidelines.

## UNIT-VI

**ACCEPTANCE AND OPERATIONAL TESTING :** Overview, Objective, Concerns, Workbench, Input Procedures (Task 1-3), Check Procedures, Output, Guidelines. (491-525) Post Implementation Analysis: Overview, Concerns, Workbench, Input Procedures (Task 1-7), Check Procedures, Output, and Guidelines.

## UNIT-VII

**TESTING CLIENT/SERVER SYSTEMS:** Overview, Concerns, Workbench, Input, Do Procedures (Task 1-3), Check Procedures, Output, Guidelines.

**TESTING SOFTWARE SYSTEM SECURITY:** Overview, Objective, Concerns, Background on Testing a multiplatform environment, Workbench, Input, Do Procedures (Task 1-6), Check Procedures, Output, Guidelines.

## UNIT-VIII

**TESTING A DATA WAREHOUSE:** Overview, Concerns, Workbench, Input, Do Procedures (Task 1-3), Check Procedures, Output, Guidelines.

**TESTING WEB-BASED SYSTEMS:** Overview, Concerns, Workbench, Input, Do Procedures (Task 1-4), Check Procedures, Output, Guidelines.

**TEXT BOOKS:**

- 1) William E. Perry, “Effective Methods for Software Testing (Includes Complete Guidelines and Checklists)”, 3<sup>rd</sup> Edition, Wiley India, 2006.( Units : 1 to 8 )

**REFERENCES:**

- 1) Elfriede Dustin, “Effective Software testing (50 specific ways to improve Your Testing)”, 1<sup>st</sup> Edition, Pearson Education, 2006.
- 2) Boris Beizer, “Software Testing Technique”, 2<sup>nd</sup> Edition, DreamTech Press, 2009.
- 3) K.V.K.K. Prasad, “Software Testing Tools”, 1<sup>st</sup> Edition, Dream Tech Press, 2007.



## MANAGEMENT SCIENCE

**Course Code: AHM 1102**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>

### AIM:

To understand the management processes and evolve management levels for effective decision making

### OBJECTIVE :

To familiarize with the process of management and to provide basic insights to select contemporary management practices.

### UNIT-I

**INTRODUCTION TO MANAGEMENT :** Concepts of Management and Organization – Nature, Importance and Functions of Management, Taylor’s Scientific Management Theory, Fayol’s Principles of Management, Mayo’s Hawthorne experiments, Maslow’s Theory of human needs, Douglas Mc Gregor’s Theory X and Theory Y, Herzberg’s Two factor Theory of motivation, Systems approach to Management, Leadership styles

### UNIT-II

**DESIGNING ORGANIZATIONAL STRUCTURES:** Basic concepts related to Organization, Departmentation and Decentralization, Types of mechanistic and organic structure of organization (Line Organization, Line and staff Organization, Functional Organization, Committee Organization, Matrix Organization, Virtual Organization, Cellular Organization, Team Structure, Boundaryless Organization, Inverted Pyramid Structure, Lean and Flat Organization Structure) and their merits, demerits and suitability

### UNIT-III

**OPERATIONS MANAGEMENT :** Principles and Types of Plant Layout, Methods of Production (Job, Batch and Mass Production), Work Study, Basic procedure involved in Method Study and Work



Measurement, Statistical Quality Control: R chart, P chart, C chart (Simple numerical problems)

#### **UNIT-IV**

**MATERIALS MANAGEMENT** : Objectives, Need for Inventory control, EOQ, ABC & VED Analysis, Purchase Procedure, Stores Management and Stores Records (simple numerical problems) Just in Time System (JIT).

#### **UNIT-V**

**MARKETING MANAGEMENT** : Functions of Marketing, Marketing mix, marketing strategies based on product life cycle, Channels of distribution, Consumer behavior and Customer relationship management

#### **UNIT-VI**

**HUMAN RESOURCES MANAGEMENT** : Concepts of HRM, HRD and Personnel Management and Industrial Relations (PMIR ), HRM vs. PMIR, Basic functions of HR Manager : Manpower planning, Recruitment, Selection, Training and Development, Placement, Performance Appraisal, Job Evaluation and Merit Rating Grievance handling and Welfare Administration

Introduction to Social Security Laws: Payment of Gratuity Act (1972), Employees Provident Fund & Miscellaneous Provisions Act (1958), Employees State Insurance Act (1948)

#### **UNIT-VII**

**PROJECT MANAGEMENT (PERT / CPM)** : Network Analysis, Programme Evaluation and Review Technique (PERT), Critical Path Method (CPM), Identifying critical path, probability of completing the project within given time, project cost analysis, project crashing (simple numerical problems)

#### **Unit-VIII**

**STRATEGIC MANAGEMENT** : Mission, Goals, Objectives, Policy, Strategy, Programmes, Elements of Corporate Planning Process, Environmental Scanning, Steps in strategy formulation and implementation, value Chain Analysis, SWOT Analysis

Corporate social responsibility, business ethics and corporate governance

### **TEXT BOOKS:**

1. A R Aryasri, “Management Science”, 4<sup>th</sup> Edition, Tata McGraw Hill, 2010.
2. O P Khanna, “Industrial Engineering and Management”, 2<sup>nd</sup> Edition, Dhanpat Rai Publishers, 2008.

### **REFERENCES:**

1. Azhar Kazmi, “Strategic Management & Business Policy”, 3<sup>rd</sup> Edition, Tata McGraw Hill, 2010.
2. SD Sharma, “Operations Research” 15<sup>th</sup> Edition, Kedarnath Ramnath & Co, 2008.
3. Philip Kotler, Keller, Koshy & Jha, “Marketing Management”, 13<sup>th</sup> Edition, Pearson Education, 2009.
4. CB Matoria & SV Gankar, “Personnel Management”, 28<sup>th</sup> Edition, Himalaya Publishing, 2008.
5. BS Goel, “Production & Operations Management”, 20<sup>th</sup> Edition, Pragati Prakasan, 2008.
6. Srinivasan R, “Strategic Management”, 3<sup>rd</sup> Edition, Eastern Economy, 2009.  
LM Prasad, “Principles & Practices of Management”, 7<sup>th</sup> Edition, S. Chand & Sons, 2007.



## NETWORK SECURITY AND CRYPTOGRAPHY

**Course Code: ACS1102**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>1</b>	<b>0</b>	<b>4</b>

### **Aim:**

To understand the principles of encryption algorithms; conventional and public key cryptography. To have a detailed knowledge about authentication, hash functions and application level security mechanisms.

### **Objective:**

To know the methods of conventional encryption.

To understand the concepts of public key encryption and number theory

To understand authentication and Hash functions.

To know the network security tools and applications.

To understand the system level security used.

### **UNIT-I**

Introduction: Attacks, Services and Mechanisms, Security attacks, Security services, A Model for Internetwork security. Classical Techniques: Conventional Encryption model, Steganography, Conventional Encryption Principles, Conventional encryption algorithms, cipher block modes of operation, location of encryption devices.

### **UNIT-II**

Number theory: Prime and Relatively prime numbers, Modular arithmetic, Fermat's and Euler's theorems, Testing for primality, Euclid's Algorithm, the Chinese remainder theorem, Discrete logarithms, key distribution Approaches of Message Authentication, Security of Hash Functions and MACs – MD5 message Digest algorithm, Secure Hash Algorithm–RIPEMD and HMAC

### UNIT-III

Public key cryptography principles, public key cryptography algorithms, Digital signatures, digital Certificates, Certificate Authority and Key Management, Diffie-Hellman key Exchange, Kerberos, X.509 Directory Authentication Service.

### UNIT-IV

Email privacy: Pretty Good Privacy (PGP) and S/MIME.

### UNIT-V

IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management.

### UNIT-VI

Web Security Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET).

### UNIT-VII

Basic concepts of SNMP, SNMPv1 Community facility and SNMPv3. Intruders, Viruses and related threats.

### UNIT-VIII

Firewall Design principles, Trusted Systems. Intrusion Detection Systems.

### TEXT BOOKS:

1. William Stallings : Network Security Essentials (Applications and Standards) , 3<sup>rd</sup> Edition, Pearson Education, 2008.( Units : 1 to 8 )

### REFERENCES:

1. Ryan Russell, Dan Kaminsky, Rain Forest Puppy, Joe Grand, David Ahmad, Hal Flynn Ido Dubrawsky, Steve W.Manzuik and Ryan Permech: Hack Proofing your network , 2<sup>nd</sup> Edition, Wiley Dreamtech, 2002.
2. Eric Maiwald, Fundamentals of Network Security, 1<sup>st</sup> Edition, Dreamtech Press, 2003.

3. Charlie Kaufman, Radia Perlman and Mike Speciner, “Network Security - Private Communication in a Public World”, 2<sup>nd</sup> Edition, Pearson/PHI, 2002.
4. Stallings, “Cryptography and Network Security”, 3<sup>rd</sup> Edition, PHI, Pearson, 2006.
5. Whitman, “Principles of Information Security”, 3<sup>rd</sup> Edition, Thomson, 2009.
6. Robert Bragg, Mark Rhodes, “Network Security: The Complete Reference”, 1<sup>st</sup> Edition, TMH, 2004.
7. Buchmann, “ Introduction to Cryptography”, 2<sup>nd</sup> Edition, Springer, 2004.



## WEB PROGRAMMING

**Course code: ACT1134**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>1</b>	<b>0</b>	<b>4</b>

### **AIM:**

To highlight the features of different technologies involved in Web Technology and various Scripting Languages.

### **OBJECTIVES:**

This course will provide an introduction to various Scripting Languages. Students will be provided with an up-to-date survey of developments in Web Technologies and are trained in the techniques required for supporting real-time Software development.

### **UNIT-I**

**INTRODUCTION:** History of the Internet and World Wide Web – HTML 4 protocols – HTTP, SMTP, POP3, MIME, IMAP. Basic Tags of HTML, Creating Links, Tables, Frames, Forms, Form Tags.

### **UNIT-II**

**DOCUMENT OBJECT MODEL :** Concept and Importance of Document Object Model, Cascading Style Sheet (CSS). Java script: Introduction, documents, forms, statements, functions, objects, event and event handling; Dynamic HTML with Java Script.

### **UNIT-III**

**XML: INTRODUCTION :** Features of XML, Document type definition, XML Schemas, Presenting XML, Using XML Processors: DOM, SAX.

### **UNIT-IV**

**JAVA BEANS :** Introduction to Java Beans, Advantages of Java Beans, JDK Introspection, Using Bound properties, Bean Info Interface, Constrained properties Persistence, Customisation, Java Beans API, Introduction to EJB's .

## UNIT-V

**WEB SERVERS AND SERVLETS:** Tomcat web server, Introduction to Servlets: Lifecycle of a Servlet, JSDK, The Servlet API, The javax.servelet Package, Reading Servlet parameters, Reading Initialization parameters. The javax.servelet HTTP package, Handling Http Request & Responses, Using Cookies-Session Tracking, Security Issues.

## UNIT-VI

**INTRODUCTION TO JSP:** Features of JSP Pages, the Problem with Servlet. The Anatomy of a JSP Page, JSP Processing. JSP Application Design with MVC Set-up and JSP Environment: Installing the Java Software Development Kit, Tomcat Server & Testing Tomcat.

## UNIT-VII

**JSP APPLICATION DEVELOPMENT:** Generating Dynamic Content, Using Scripting Elements Implicit JSP Objects, Conditional Processing – Displaying Values Using an Expression to Set an Attribute, Declaring Variables and Methods, Error Handling and Debugging Sharing Data between JSP pages, Requests, and Users Passing Control and Data between Pages – Sharing Session and Application Data – Memory Usage Considerations.

## UNIT-VIII

**DATABASE ACCESS :** Database Programming using JDBC, Studying Javax.sql.\* package, Accessing a Database from a JSP Page, Application – Specific Database Actions, Deploying JAVA Beans in a JSP Page, Introduction to struts framework.

## TEXT BOOKS:

1. Dietel and Nieto, “Internet and World Wide Web – How to Program (Units: 1,2,3)”, 3<sup>rd</sup> Edition PHI/Pearson Education, 2003.
2. Patrick Naughton and Herbert Schildt, “The Complete Reference Java 2”, 5<sup>th</sup> Edition, TMH, 2007. ( Units : 4,5)
3. Hans Bergsten, “Java Server Pages”, 3<sup>rd</sup> Edition, O’Reilly publication, 2008.(Units : 6,7,8 )

**REFERENCE BOOKS:**

1. Raj Kamal, “Internet & Web Technologies”, 8<sup>th</sup> Edition, Tata McGraw-Hill, 2007.
2. Chris Bates, “Web Programming, Building Internet Applications”, 2<sup>nd</sup> Edition WILEY Dreamtech, 2008.
3. Xavier. C, “Web Technology and Design”, 1<sup>st</sup> Edition, New Age International, 2011.
4. Sebesta, “Programming World Wide Web”, 4<sup>th</sup> Edition, Pearson Education, 2008.
5. Marty Hall and Larry Brown, “Core Servlets and Java Server Pages Volume 1: Core Technologies”, 2<sup>nd</sup> Edition, Pearson Education, 2007.
6. Bill siggelko, “Jakarta Struts Cookbook”, 1<sup>st</sup> Edition, O’Reilly Publication, 2007.
7. Murach, “Murach’s Beginning Java jdk 5”, 1<sup>st</sup> Edition, S P D, 2007.
8. Wang Katila, “An introduction to Web Design and Programming”, 1<sup>st</sup> Edition, Thomson, 2008.
9. Knuckles, “Web Applications Technologies Concepts and Real World Design”, John Wiley, 2008.
10. Bai Ekedaw, “ Web Warrior Guide to Web Programming”, Thomas Publication, 2010.
11. Jon Duckett, “Beginning Web Programming with HTML”, XHTML, 2<sup>nd</sup> Edition, Wrox Publication, 2008.
12. Pekowsky, “Java Server Pages”, 2<sup>nd</sup> Edition, Pearson Education, 2008.





## COMPILER DESIGN

**Course Code: ACS1103**

L	T	P	C
4	1	0	4

### AIM:

To make the student understand the functioning and development of compilers.

### OBJECTIVE:

This course demonstrates different methods and techniques which are already used in different translators. These are more helpful to the learners who want to develop new translators.

### UNIT-I

Overview of Compilation: Phases of Compilation – Lexical Analysis, Regular Grammar and regular expression for common programming language features, pass and phases of translation, interpretation, bootstrapping, data structures in compilation, compiler construction tools- LEX lexical analyzer generator.

### UNIT-II

Syntax Analysis: The role of the parser, Context free grammars, Top down parsing : Top down parsing-Backtracking, LL(1), recursive descent parsing, Predictive parsing, Preprocessing steps required for predictive parsing

### UNIT-III

Bottom up parsing: Shift Reduce parsing, LR and LALR parsing, Error recovery in parsing, handling ambiguous grammar, YACC-automatic parser generator.

### UNIT-IV

Semantic analysis: Intermediate forms of source programs- abstract syntax tree, polish notation and three address codes. Attributed grammars, Syntax directed translation, Conversion of popular programming languages.

Language constructs to intermediate code forms, Type checker.

### **UNIT-V**

Symbol Tables: Symbol table format, organization for block structures languages, hashing, tree structures representation of scope information. Block structures and non block structure storage allocation: static, runtime stack and heap storage allocation, storage allocation for arrays, strings and records.

### **UNIT-VI**

Code optimization: Consideration for optimization, Scope of optimization, local optimization, loop optimization, frequency reduction, folding, DAG representation.

### **UNIT-VII**

Data flow analysis: Flow graph, data flow equation, global optimization, redundant sub expression elimination, Induction variable elements, Live variable analysis, Copy propagation.

### **UNIT-VIII**

Object Code generation: Object code forms, machine dependent code optimization, register allocation and assignment generic code generation algorithms, DAG for register allocation.

### **TEXT BOOKS:**

1. A.V.Aho, J.D.Ullman Ravisethi : Principles of compiler design, 2<sup>nd</sup> Edition, Pearson Education, 2008. ( Units : 1 to 8 )

### **REFERENCES:**

1. John R.Levine, Tony Mason, Doug Brown, “Lex and Yacc”, 2<sup>nd</sup> Edition, O’Reilly, 2005.
2. Andrew N.Appel, “Modern Compiler Implementation in C”, 2<sup>nd</sup> Edition, Cambridge University Press, 2007.
3. Dick Grune, Henry E.Bal, Cariel T.H.Jacobs, “Modern Compiler Design”, 1<sup>st</sup> Edition, Wiley Dreamtech , 2003.
4. Cooper & Linda, “Engineering a Compiler”, 3<sup>rd</sup> Edition, Elsevier, 2003.

5. Liden, Thomson : Compiler Construction, 2<sup>nd</sup> Edition, Thomson, 2007.
6. Raghavan : Principles of compile of compiler design, 1<sup>st</sup> Edition, TMH, 2009.

#### **WEB REFERENCES:**

<http://www.nptel.iitm.ac.in/courses/Webcourse-contents/IIT-KANPUR/compiler-desing/ui/About-Faculty.html>

## OBJECT ORIENTED ANALYSIS AND DESIGN

Course code: ACT1120

L	T	P	C
4	0	0	4

### AIM:

To understand the basics of object oriented systems and the systems development life cycle and design methods.

### OBJECTIVE:

To provide an overview of object oriented systems development and its importance. To know about unified modeling language and concepts of system modeling.

### UNIT-I

**AN OVERVIEW OF OBJECT ORIENTED SYSTEMS DEVELOPMENT :** Introduction, Two Orthogonal Views of the Software, Object Oriented Systems Development Methodology, Why an Object Orientation?(Ali Bahrami).

**WHY WE MODEL:** The Importance of Modeling, Principles of Modeling, Object Oriented Modeling

**INTRODUCING THE UML:** An overview of the UML, A Conceptual Model of the UML, Architecture, Software Development Life Cycle

### UNIT-II

**BASIC STRUCTURAL MODELING:** Classes, Relationships, common Mechanisms, and diagrams, class diagrams.

### UNIT-III

**ADVANCED STRUCTURAL MODELING:** Advanced classes, advanced relationships, Interfaces, Types and Roles, Packages, Object Diagrams.

### UNIT-IV

**BASIC BEHAVIORAL MODELING:** Interactions, Interaction diagrams, Usecases, Usecase diagrams, Activity Diagrams.

## UNIT-V

**ADVANCED BEHAVIORAL MODELING:** Events and signals, state machines, processes and Threads, time and space, state chart diagrams.

## UNIT-VI

**ARCHITECTURAL MODELING I:** Component, Deployment, Component diagrams and Deployment diagrams

## UNIT-VII

**ARCHITECTURAL MODELINGII:** Patterns and Frameworks, Collaborations, Systems and Models.

## UNIT-VIII

**CASE STUDY:** Bank ATM Application

### TEXT BOOKS:

1. Grady Booch, James Rumbaugh, Ivar Jacobson, “The Unified Modeling Language User Guide (Units :1)”, Edition, Pearson Education, 2006.
2. Ali Baharami, “Object Oriented Systems Development Using the Unified Modeling Language (Units : 2 to 8 )”, 1<sup>st</sup> Edition, TMH, 2000.

### REFERENCE BOOKS:

1. Meilir Page-Jones, “Fundamentals of Object Oriented Design in UML”, 1<sup>st</sup> Edition, Pearson Education, 2006.
2. Pascal Roques, “Modeling Software Systems Using UML2”, 1<sup>st</sup> Edition, WILEY Dreamtech, 2007.
3. Atul Kahate, “Object Oriented Analysis & Design”, 1<sup>st</sup> Edition, TMH, 2007.
4. Mark Priestley, “Practical Object-Oriented Design with UML”, 2<sup>nd</sup> Edition, TMH, 2005.
5. Craig Larman, “Applying UML and Patterns: An introduction to Object – Oriented Analysis and Design and Unified Process”, 3<sup>rd</sup> Edition, Pearson Education, 2007.



## WEB PROGRAMMING AND UML LAB

**Course Code: ACS1104**

L	T	P	C
0	0	3	2

### OBJECTIVE :

To create a fully functional website with mvc architecture. To Develop an online Book store. (Ex amazon .com).

### HARDWARE AND SOFTWARE REQUIRED :

1. A working computer system with either Windows or Linux
2. A web browser either IE or firefox
3. Tomcat web server and Apache web server
4. XML editor like Altova Xml-spy [www.Altova.com/XMLSpy – free ] , Stylusstudio , etc.,
5. A database either Mysql or Oracle
6. JVM(Java virtual machine) must be installed on your system
7. BDK(Bean development kit) must also be installed

### WEEK-1

Design the following static web pages required for an online book store web site.

#### 1) HOME PAGE:

The static home page must contain three **frames**.

Top frame : Logo and the college name and links to Home page, Login page, Registration page,

Catalogue page and Cart page (the description of these pages will be given below).

Left frame : At least four links for navigation, which will display the catalogue of respective links.

For e.g.: When you click the link “CSE” the catalogue for CSE Books should be displayed in the Right frame.

Right frame: The *pages to the links in the left frame must be loaded here*. Initially this page contains description of the web site.

Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
CSE ECE EEE CIVIL	Description of the website			

## 2) LOGIN PAGE:

This page looks like below:




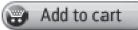

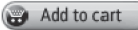


Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
CSE ECE EEE CIVIL	Login : <input type="text"/> Password: <input type="password"/> <input type="submit" value="Submit"/> <input type="submit" value="Reset"/>			

## 3) CATALOGUE PAGE:

The catalogue page should contain the details of all the books available in the web site in a table.

The details should contain the following:

1. Snap shot of Cover Page.
2. Author Name.
3. Publisher.
4. Price.
5. Add to cart button.

Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
CSE		Book : XML Bible Author : Winston Publication : Wiely	\$ 40.5	
ECE				
EEE		Book : AI Author : S.Russel Publication : Princeton hall	\$ 63	
CIVIL				
		Book : Java 2 Author : Watson Publication : BPB publications	\$ 35.5	
		Book : HTML in 24 hours Author : Sam Peter Publication : Sam publication	\$ 50	

Note: Week 2 contains the remaining pages and their description.

## WEEK-2

### 4) CART PAGE:

The cart page contains the details about the books which are added to the cart.

The cart page should look like this:

Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
CSE	Book name	Price	Quantity	Amount
ECE	Java 2	\$ 35.5	2	\$ 70
EEE	XML bible	\$ 40.5	1	\$ 40.5
CIVIL			Total amount-	\$130.5



## 5) REGISTRATION PAGE:

Create a “*registration form*” with the following fields

- 1) Name (Text field)
- 2) Password (password field)
- 3) E-mail id (text field)
- 4) Phone number (text field)
- 5) Sex (radio button)
- 6) Date of birth (3 select boxes)
- 7) Languages known (check boxes – English, Telugu, Hindi, Tamil)
- 8) Address (text area)

## WEEK 3

### VALIDATION:

Write *JavaScript* to validate the following fields of the above registration page.

1. Name (Name should contains alphabets and the length should not be less than 6 characters).
2. Password (Password should not be less than 6 characters length).
3. E-mail id (should not contain any invalid and must follow the standard pattern name@domain.com)
4. Phone number (Phone number should contain 10 digits only).  
Note : You can also validate the login page with these parameters.

## WEEK-4

Design a web page using **CSS (Cascading Style Sheets)** which includes the following:

- 1) Use different font, styles:  
In the style definition you define how each selector should work (font, color etc.).  
Then, in the body of your pages, you refer to these selectors to activate the styles.  
For example:

```

<HTML>
<HEAD>
<style type="text/css">
B.headline {color:red; font-size:22px; font-family:arial; text-
decoration:underline}
</style>
</HEAD>
<BODY>
<b>This is normal bold</b><br>
Selector {cursor:value}
For example:
<html>
<head>
<style type="text/css">
.xlink {cursor:crosshair}
.hlink{cursor:help}
</style>
</head>
<body>
<b>
<a href="mypage.htm" class="xlink">CROSS LINK</a>
<br>
<a href="mypage.htm" class="hlink">HELP LINK</a>
</b>
</body>
</html>
<b class="headline">This is headline style bold</b>
</BODY>
</HTML>

```

- 2) Set a background image for both the page and single elements on the page. You can define the background image for the page like this:

```
BODY {background-image:url(myimage.gif);}
```

- 3) Control the repetition of the image with the background-repeat property.

As background-repeat: repeat

Tile the image until the entire page is filled, just like an ordinary background image in plain HTML.

- 4) Define styles for links as

A:link

A:visited

A:active

A:hover

Example:

```
<style type="text/css">
```

```
A:link {text-decoration: none }
```

```
A:visited {text-decoration: none }
```

```
A:active {text-decoration: none }
```

```
A:hover {text-decoration: underline; color: red; }
```

```
</style>
```

- 5) Work with layers:

For example:

LAYER 1 ON TOP:

```
<div style="position:relative; font-size:50px; z-index:2;">LAYER  
1</div>
```

```
<div style="position:relative; top:-50; left:5; color:red; font-
```

size:80px; z-  
div>

index:1">LAYER 2</

LAYER 2 ON TOP:

```
<div style="position:relative; font-size:50px; z-index:3;">LAYER  
1</div>
```

```
<div style="position:relative; top:-50; left:5; color:red; font-  
size:80px; z-  
index:4">LAYER 2</div>
```

6) Add a customized cursor:

Selector { cursor:value }

For example:

```
<html>  
<head>  
<style type="text/css">  
.xlink { cursor:crosshair }  
.hlink { cursor:help }  
</style>  
</head>  
<body>  
<b>  
<a href="mypage.htm" class="xlink">CROSS LINK</a>  
<br>  
<a href="mypage.htm" class="hlink">HELP LINK</a>  
</b>  
</body>  
</html>
```

## WEEK-5

Write an XML file which will display the Book information which includes the following:

- 1) Title of the book
- 2) Author Name
- 3) ISBN number
- 4) Publisher name
- 5) Edition
- 6) Price

Write a Document Type Definition (DTD) to validate the above XML file.

Display the XML file as follows.

The contents should be displayed in a table. The header of the table should be in color GREY. And the Author names column should be displayed in one color and should be capitalized and in bold. Use your own colors for remaining columns.

Use XML schemas XSL and CSS for the above purpose.

Note: Give at least for 4 books. It should be valid syntactically.

Hint: You can use some xml editors like XML-spy.

## WEEK-6

VISUAL BEANS:

Create a simple visual bean with a area filled with a color.

The shape of the area depends on the property shape. If it is set to true then the shape of the area is Square and it is Circle, if it is false.

The color of the area should be changed dynamically for every mouse click. The color should also be changed if we change the color in the “property window”.

## WEEK-7

- 1) Install TOMCAT web server and APACHE. While installation assign port number 4040 to TOMCAT and 8080 to APACHE.

Make sure that these ports are available i.e., no other process is using this port.

- 2) Access the above developed static web pages for books web site, using these servers by putting the web pages developed in week-1 and week-2 in the document root. Access the pages by using the urls : <http://localhost:4040/rama/books.html> (for tomcat) <http://localhost:8080/books.html> (for Apache)

## WEEK-8

### USER AUTHENTICATION :

Assume four users user1,user2,user3 and user4 having the passwords pwd1,pwd2,pwd3 and pwd4 respectively. Write a servlet for doing the following.

1. Create a Cookie and add these four user id's and passwords to this Cookie.
2. Read the user id and passwords entered in the Login form (week1) and authenticate with the values (user id and passwords) available in the cookies.

If he is a valid user(i.e., user-name and password match) you should welcome him by name(user-name) else you should display “ You are not an authenticated user “.

Use init-parameters to do this. Store the user-names and passwords in the webinf.xml and access them in the servlet by using the getInitParameters() method.

## WEEK-9

Install a database(Mysql or Oracle).

Create a table which should contain at least the following fields: name, password, email-id, phone number(these should hold the data from the registration form).

Practice ‘JDBC’ connectivity.

Write a java program/servlet/JSP to connect to that database and extract data from the tables and display them. Experiment with various SQL queries.

Insert the details of the users who register with the web site, whenever a new user clicks the submit button in the registration page (week2).

### **WEEK-10**

Write a JSP which does the following job:

Insert the details of the 3 or 4 users who register with the web site (week9) by using registration form. Authenticate the user when he submits the login form using the user name and password from the database ( similar to week8 instead of cookies).

### **WEEK-11**

#### **MINI-PROJECT-I: ONLINE BOOKSHOP EXAMPLE**

Following the model of amazon.com or bn.com, design and implement an online bookstore.

### **WEEK-12**

#### **MINI-PROJECT-II: AN AUCTION APPLICATION**

Several commerce models exist and are the basis for a number of companies like eBay.com, priceline.com etc. Design and implement an auction application that provides auctioning services. It should clearly model the various auctioneers, the bidding process, auctioning etc.

### **WEEK-13**

#### **MINI-PROJECT -III: A GRAPHICS EDITOR**

Design and implement a Java class collection that supports the construction of graph editing applications, i.e., applications that include the ability to draw structured and unstructured diagrams.

E.g.,

The goal of the GEF project is to build a graph editing library that can be used to construct many, high-quality graph editing applications.

Some of GEF's features are:

A simple, concrete design that makes the framework easy to understand and extend.

Node-Port-Edge graph model that is powerful enough for the vast majority of connected graph applications.

Model-View-Controller design based on the Swing Java UI library makes GEF able to act as a UI to existing data structures, and also minimizing learning time for developers familiar with Swing.

High-quality user interactions for moving, resizing, reshaping, etc. GEF also supports several novel interactions such as the broom alignment tool and section-action-buttons.

Generic properties sheet based on JavaBeans introspection.

XML-based file formats based on the PGML standard.





## NETWORK SECURITY AND CRYPTOGRAPHY LAB

**Course Code: ACS1105**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>3</b>	<b>2</b>

### **AIM:**

To understand the principles of encryption algorithms; conventional and public key cryptography practically.

### **OBJECTIVE:**

To know the methods of conventional encryption.

To understand the concepts of public key encryption and number theory

To understand authentication

The following programs should be implemented preferably on platform using C

### **LANGUAGE (FOR 1-5) AND OTHER STANDARD UTILITIES AVAILABLE WITH UNIX SYSTEMS (FOR 6-8) :-**

1. Implement the encryption and decryption of 8-bit data using Simplified DES Algorithm (created by Prof. Edward Schaefer) in C
2. Write a program to break the above DES coding
3. Implement Linear Congruential Algorithm to generate 5 pseudo-random numbers in C
4. Implement Rabin-Miller Primality Testing Algorithm in C
5. Implement the Euclid Algorithm to generate the GCD of an array of 10 integers in C
6. Implement RSA algorithm for encryption and decryption in C
7. Configure a mail agent to support Digital Certificates, send a mail and verify the correctness of this system using the configured parameters.

8. Configure SSH (Secure Shell) and send/receive a file on this connection to verify the correctness of this system using the configured parameters.
9. Configure a firewall to block the following for 5 minutes and verify the correctness of this system using the configured parameters:
  - (a) Two neighborhood IP addresses on your LAN
  - (b) All ICMP requests
  - (c) All TCP SYN Packets



---

---

***COURSE STRUCTURE &  
SYLLABI FOR VII SEMESTER***

---

---



## EMBEDDED SYSTEMS

(Common to CSE & IT)

**Course Code: ACT1121**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>1</b>	<b>0</b>	<b>4</b>

### AIM :

To provide the student with a basic understanding of the principles of Embedded Systems and their practical applications.

### OBJECTIVE :

1. To acquaint the student with a number of Embedded System architectures
2. To help the student become conversant with an integrated development environment (IDE) for development, simulation and debugging of programmes.

### UNIT-I

**THE ARM INSTRUCTION SET ARCHITECTURE :** The bus structure and the peripherals. Memory organization, Processor initialization [startup code], Load store instruction set, Assembly programming using Assemblers. Linkers, Loaders and Debuggers.

### UNIT-II

**ARM/THUMB ARCHITECTURE :** Program structure to Supervisor, Kernel, and User modes. Peripherals and their control: GPIO, Timers, Counters, PWM, ADC and serial communication application examples in assembly code.

### UNIT-III

**APPLICATION CODING EXAMPLES:** Measurement and control of time, frequency velocity acceleration, power control, gesture and touch monitoring.

## UNIT-IV

Modern communication protocols starting with addressable USART, SPI bus, I2C bus and USB; their characteristics protocols and usage in high speed communication.

## UNIT-V

Introduction to MIPS processor architecture in PIC 32 bit family, CPU architecture and a detailed introduction to peripherals, GPIO, timers, capture control and PWM features. Instruction set usage with application examples.

( <http://ww1.microchip.com/downloads/en/DeviceDoc/61146B.pdf> )

## UNIT-VI

Simulation and debugging of programs using MPLAB Integrated Development Environment. Interrupts, modes and vectored interrupt priority processing using the many shadow registers. Challenges in development of intelligent programs.

## UNIT-VII

Introduction to RTOS and its need in real time applications: in industry, particularly in robots, automobiles and gesture identification.

## UNIT-VIII

Introduction to In Circuit Emulation techniques using JTAG. Watching CPU activity, and techniques of in circuit flash programming.

## TEXT BOOKS:

1. B.Kanta Rao, “Embedded Systems”, 1<sup>st</sup> Edition, PHI Learning Private Limited, 2011. (Units 1, 3, 7)
2. Trevor Martin, “Introduction to the LPC2000”, 1<sup>st</sup> Edition, Hitex (UK) Ltd, 2005. (Units 1, 2, 4)
3. Lucio Di Jasio, “Programming 32-bit Microcontrollers in C Exploring the PIC 32”, 1<sup>st</sup> Edition, Newnes, 2008. (Units 6,8)

## REFERENCE BOOKS:

1. A.N.Sloss, D.Symes and C. Wright, “RM system’s Developer Guide, Designing and Optimizing system software”, 1<sup>st</sup> Edition,

Morgann Kaufmann Publishers, 2004.

2. Steve Furber, “ARM system on Chip Architecture”, 2<sup>nd</sup> Edition, Adison Wesley Publishers, 2000.
3. David Seal, “ARM Architecture reference Manual”, 2<sup>nd</sup> Edition, Adison Wesley Publishers, 2001.

### **Web Reference Books:**

1. <http://ww1.microchip.com/downloads/en/DeviceDoc/61146B.pdf> (Unit 5)



## MULTIMEDIA AND APPLICATION DEVELOPMENT

(Common to CSE & IT)

**Course Code:ACT1122**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>

### AIM :

To introduce core concepts of multimedia to the students and to make them capable of developing multimedia application using FLASH CS 5.

### OBJECTIVES :

- To give an overview of different multimedia data formats and their internal storage mechanism.
- To enable the students to understand different issues of multimedia communication.
- To make the students capable of developing multimedia applications in FLASH CS5 using Action script 3.0.

### UNIT-I

**INTRODUCTION TO MULTIMEDIA:** What is Multimedia? Multimedia and Hypermedia, World Wide Web, Overview of Multimedia Software Tools. Graphics and Image Data Representations: Graphics/Image Data Types, Popular File Formats.

**ACTION SCRIPT 3.0 CORE CONCEPTS:** Tools for writing action script code, Flash client runtime environments, compilation, just in time compilation, classes and objects, creating a program, packages, defining a class, variable and values, constructor parameters and arguments.

### UNIT-II

**COLOR IN IMAGE AND VIDEO:** color science, color models in images, color models in video.

**ACTION SCRIPT 3.0 CONDITIONALS, LOOPS AND FUNCTIONS:** conditionals, loops, Boolean logic. Functions: package-level functions, nested functions, source-file-level functions, accessing definitions from within a function, functions as values.



### UNIT-III

#### **FUNDAMENTAL CONCEPTS IN VIDEO AND DIGITAL**

**AUDIO:** Types of video signals, analog video, digital video, digitization of sound, MIDI, quantization and transmission of audio.

#### **ACTION SCRIPT 3.0 DATA TYPES AND TYPE CHECKING:**

Data types and type annotations, untyped variables, parameters, return values, strict modes three special cases, warnings for missing type annotations, detecting reference errors at compile time, casting, conversion to primitive types, default variable values, null and undefined.

### UNIT-IV

**MULTIMEDIA DATA COMPRESSION :** Lossless compression algorithms: Run-Length Coding, Variable Length Coding, and Dictionary Based Coding. Lossy compression algorithms: Quantization, Transform Coding, Wavelet-Based Coding.

**ACTION SCRIPT 3.0 INHERITANCE :** A primer on inheritance, overriding instance methods, constructor methods in sub classes, preventing classes from being extended and methods from being overridden.

### UNIT-V

**BASICS OF VIDEO COMPRESSION :** Introduction to Video Compression, Video Compression with Motion Compensation, Search for Motion Vectors

**ACTION SCRIPT 3.0 INTERFACES :** The case for interfaces, interfaces and multiple data type classes, interface syntax and use, another multiple type example.

### UNIT-VI

**VIDEO CODING :** Overview of MPEG-1, MPEG-2 and MPEG-4. Motion compensation in MPEG-1, MPEG-2 Profiles, Object-based Visual Coding in MPEG-4, Synthetic Object Coding in MPEG-4, MPEG-4 Object types, Profile and Levels.

**ACTION SCRIPT 3.0 ARRAYS :** What is an array?, the anatomy of an array, creating an array, using single dimensional and multi dimensional arrays.

## UNIT-VII

**MULTIMEDIA NETWORKS :** Basics of Multimedia Networks, Quality of Multimedia Data Transmission.

### **ACTION SCRIPT 3.0 EVENTS AND EVENT HANDLING :**

Action script event basics, accessing the target Object, Accessing the object that registered the listener, preventing default event behavior, Event Listener priority, Event listeners and memory management.

## UNIT-VIII

**MULTIMEDIA COMMUNICATION :** Multimedia over IP, Multimedia over ATM Networks, Transport of MPEG-4, Media-on-Demand (MOD).

**ACTION SCRIPT 3.0 :** The exception handling cycle, handling multiple types of exceptions, exception bubbling, The finally block, nested exceptions.

### **TEXT BOOKS:**

1. Ze-Nian Li and Mark S.Drew, “Fundamentals of Multimedia”, 1<sup>st</sup> Edition, PHI/Pearson Education, 2004.
2. Colin Moock, “Essential Action Script 3.0”, 1<sup>st</sup> Edition, SPD O’Reilly, 2007.

### **REFERENCE BOOKS:**

1. Nigel Chapman and Jenny Chapman, “Digital Multimedia”, 3<sup>rd</sup> Edition, Wiley Dreamtech, 2009.
2. Steve Heath, “Multimedia and communications technology”, 2<sup>nd</sup> Edition, Elsevier(Focal Press), 1999.
3. Steinmetz, Ralf, Nahrstedt, “Multimedia Applications”, 1<sup>st</sup> Edition, Springer, 2004.
4. Weixel, “Multimedia Basics”, 2<sup>nd</sup> Edition, Thomson Press, 2006.



## COMPUTER ARCHITECTURE

**Course Code: ACS1106**

L	T	P	C
4	1	0	4

### AIM:

To teach the student advanced computer concepts and provide an understanding of various computer technologies.

### OBJECTIVE:

To provide a quantitative approach to the science of computer architecture, organisation and design.

### UNIT-I

Fundamentals of Computer design, Technology trends, cost, measuring and reporting performance, quantitative principles of computer design.

### UNIT-II

Instruction set principles and examples, classifying instruction set, memory addressing, type and size of operands, addressing modes for signal processing, operations in the instruction set, instructions for control flow, encoding an instruction set, the role of compiler

### UNIT-III

Instruction level parallelism (ILP), overcoming data hazards, reducing branch costs, high performance instruction delivery; hardware based speculation, limitation of ILP

### UNIT-IV

ILP software approach, compiler techniques, static branch protection, VLIW approach, H/W support for more ILP at compile time, H/W versus S/W Solutions

### UNIT-V

Memory hierarchy design; cache performance, reducing cache miss penalty and miss rate, virtual memory, protection and examples of VM.

## UNIT-VI

Multiprocessors and thread level parallelism, symmetric shared memory architectures, distributed shared memory, synchronization, multi threading.

## UNIT-VII

Storage systems- Types, Buses, RAID, errors and failures, bench marking a storage device, designing an I/O system.

## UNIT-VIII

Inter connection networks and clusters; interconnection network media, practical issues in inter connecting networks, examples, designing a cluster.

## TEXT BOOK:

1. John L. Hennessy & David A. Patterson, “Computer Architecture A quantitative approach”, Morgan Kaufmann, 3<sup>rd</sup> Edition, An Imprint of Elsevier, 2011.

## REFERENCE BOOKS:

1. Kai Hwang and A. Briggs, “Computer Architecture and parallel Processing”, 1<sup>st</sup> Edition , International Edition McGraw Hill, 2004.
2. Dezso Sima, Terence Fountain, Peter Kacsuk, “Advanced Computer Architectures”, 1<sup>st</sup> Edition, Pearson, 2005.
3. David E. Culler, Jaswinder Pal Singh, “Parallel Computer Architecture A Hardware / Software Approach”, 2<sup>nd</sup> Edition, Princeton, 2005.



## PRINCIPLES OF DATA WAREHOUSING AND DATA MINING

**Course code: ACS1114**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>1</b>	<b>0</b>	<b>4</b>

### **AIM:**

To introduce the student to various data warehousing and data mining techniques

### **OBJECTIVE:**

To make the student capable of applying data mining and data warehousing techniques

### **UNIT-I**

**INTRODUCTION :** Data mining-On what kinds of Data, what kinds of patterns can be mined, which technologies are used, which kinds of applications are targeted, Major issues in Data Mining.

### **UNIT-II**

**DATA PREPROCESSING :** An Overview, Data Cleaning, Data Integration, Data Reduction, Data Transformation and Data Discretization.

### **UNIT-III**

**DATA WAREHOUSE AND OLAP TECHNOLOGY :** Data Warehouse: Basic concepts, Data Warehouse Modeling: Data Cube and OLAP, Data Warehouse design and usage, Data Warehouse Implementation.

### **UNIT-IV**

**DATA GENERALIZATION AND DATA CUBE COMPUTATION:** Data generalization by Attribute-Oriented Induction, Data Cube Computation: Preliminary concepts, Data Cube Computation methods, Multidimensional Data Analysis in Cube space.

### **UNIT-V**

**MINING FREQUENT PATTERNS, ASSOCIATION AND**

**CORRELATIONS :** Basic Concepts, Efficient and Scalable Frequent Item set Mining Methods, Which patterns Are interesting?-Pattern Evaluation methods.

### UNIT-VI

**CLASSIFICATION: Basic concepts :** Classification by Decision Tree Induction, Bayesian Classification, Rule-Based Classification.

### UNIT-VII

**CLASSIFICATION: Advanced concepts :** Support Vector Machines, Classification using frequent patterns.

### UNIT-VIII

**CLUSTERANALYSIS: Basic Concepts:** Cluster analysis, Partitioning Methods, Hierarchical Methods, Density-Based Methods, Grid-Based Methods, Outlier and Outlier Analysis.

### TEXT BOOKS:

- 1 Jiawei Han & Micheline Kamber, “Data Mining – Concepts and Techniques”, 3<sup>rd</sup> Edition, Morgan Kaufmann Publishers, 2008.
- 2 Margaret H Dunham, “Data Mining Introductory and Advanced Topics”, 6<sup>th</sup> Edition, Pearson Education, 2009.

### REFERENCE BOOKS:

1. Arun K Pujari, “Data Mining Techniques” , 1<sup>st</sup> Edition, University Press, 2005.
2. Pang- Ning Tan, Michael Steinbach, Vipin Kumar, “Introduction to Data Mining” , 1<sup>st</sup> Edition, Pearson Education,2009.
3. Sam Aanhory & Dennis Murray, “Data Warehousing in the Real World” , 1<sup>st</sup> Edition, Pearson Edn Asia,2008.
4. Paulraj Ponnaiah, “Data Warehousing Fundamentals” , 1<sup>st</sup> Edition, Wiley student Edition,2007.
5. Ralph Kimball, “The Data Warehouse Life Cycle Tool Kit” , 2<sup>nd</sup> Edition, Wiley student Edition, 2005.



# NATURAL LANGUAGE PROCESSING

(ELECTIVE-I)

**Course Code: ACS1107**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>1</b>	<b>0</b>	<b>4</b>

## AIM:

To lay out the mathematical and linguistic foundations for Natural Language Processing.

## OBJECTIVE:

To introduce statistical methods and models to process natural languages.

## UNIT-1

**INTRODUCTION :** Rationalist and Empiricist Approaches to Language, Scientific Content, Questions that linguistics should answer , Non-categorical phenomena in language , Language and cognition as probabilistic phenomena, The Ambiguity of Language: Why NLP Is Difficult, Dirty Hands, Lexical resources, Word counts, Zipf's laws, Collocations, Concordances.

## UNIT-II

**MATHEMATICAL FOUNDATIONS :** Elementary Probability Theory, Probability spaces, Conditional probability and independence, Bayes' theorem, Random variables, Expectation and variance, Notation, Joint and conditional distributions, Determining, Standard distributions, Bayesian statistics, Essential Information Theory, Entropy, Joint entropy and conditional entropy, Mutual information, The noisy channel model, Relative entropy or Kullback-Leibler divergence, The relation to language: Cross entropy , The entropy of English, Perplexity.

## UNIT-III

**LINGUISTIC ESSENTIALS :** Parts of Speech and Morphology, Nouns pronouns , Words that accompany nouns: Determiners and adjectives , Verbs, Other parts of speech, Phrase Structure , Phrase

structures, Dependency: Arguments and adjuncts, X' theory, Phrase structure ambiguity, Semantics and pragmatics.

#### UNIT-IV

**WORDS COLLOCATIONS :** Frequency, Mean and Variance, Hypothesis Testing, The t-test, Hypothesis testing of differences, Pearson's chi-square test, Likelihood ratios, Mutual Information, The Notion of Collocation.

#### UNIT-V

#### **STATISTICAL INFERENCE: N -GRAM MODELS OVER**

**SPARSE DATA BINS:** Forming Equivalence Classes, Reliability vs. discrimination , n-gram models, Statistical Estimators, Maximum Likelihood Estimation, Laplace's law, Lidstone's law and the Jeffreys-Perks law , Held out estimation, Cross-validation (deleted estimation), Good-Turing estimation, Briefly noted, Combining Estimators , Simple linear interpolation, Katz's backing-off, General linear interpolation, Briefly noted Language models for Austen.

#### UNIT-VI

**WORD SENSE DISAMBIGUATION :** Methodological Preliminaries, Supervised and unsupervised learning, Pseudo words, Upper and lower bounds on performance, Supervised Disambiguation, Bayesian classification, An information-theoretic approach, Dictionary-Based Disambiguation, Disambiguation based on sense definitions, Thesaurus-based disambiguation, Disambiguation based on translations in a second-language corpus, One sense per discourse, one sense per collocation, Unsupervised Disambiguation, What is a Word Sense?

#### UNIT-VII

**LEXICAL ACQUISITION :** Evaluation Measures, Verb Sub categorization, Attachment ambiguity, General remarks on PP attachment, Selection Preferences, Semantic, Vector space model, Probabilistic measures, The Role of Lexical Acquisition in Statistical NLP.

#### UNIT-VIII

**MARKOV MODELS :** Markov Models, Hidden Markov Models,



Why use, General form of an HMM, The Three Fundamental Questions for HMMs, Finding the probability of an observation, Finding the best state sequence, The third problem: Parameter estimation, Implementation, Properties and Variants, Implementation, Variants, Multiple input observations, Initialization of parameter values.

### **TEXT BOOK:**

1. Christopher D. Manning and Heinrich Schutze, “Foundations of Statistical Natural Language Processing”, 1<sup>st</sup> Edition, MIT Press, 1999.

### **REFERENCE BOOKS:**

1. Dan Jurafsky and James H. Martin, “Speech and Language Processing”, 2<sup>nd</sup> Edition, Prentice Hall, 2008.
2. Manu Konchady, “Text Mining Application Programming”, 1<sup>st</sup> Edition, Delmar Cengage, 2006.



# UNIX NETWORK PROGRAMMING

(ELECTIVE-I)

(Common to CSE & IT)

**Course Code: ACT1124**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>1</b>	<b>0</b>	<b>4</b>

## AIM:

To teach the students how to write programs that communicate with other programs across a computer network.

## OBJECTIVE:

The students shall be able to write their own network programs in UNIX, e.g. client and server programs using TCP sockets, UDP sockets, and all types of IPC.

## UNIT-I

**INTRODUCTION TO NETWORK PROGRAMMING:** OSI model, Unix standards, TCP and UDP, TCP connection establishment and termination, Buffer sizes and limitations, Standard Internet services, Protocol usage by common internet applications.

## UNIT-II

**SOCKETS :** Address structures, Value – result arguments, Byte ordering and manipulation functions and related functions. Elementary TCP sockets – *socket*, *connect*, *bind*, *listen*, *accept*, *fork* and *exec* functions, concurrent servers, *close* function and related functions.

## UNIT-III

**TCP CLIENT SERVER EXAMPLE:** Introduction, TCPEcho server and client functions, Normal startup and Termination, Signal handling, Server process termination, Crashing and Rebooting of server host, Shutdown of server host.

## UNIT-IV

**I/O MULTIPLEXING :** I/O Models, *select* function, Batch input, *shutdown* function, *poll* function, TCP Echo server.

## UNIT-V

**ELEMENTARY UDPSOCKETS :** Introduction, *recvfrom* and *sendto* functions, UDP Echo server and client functions, Lost datagrams, , Lack of flow control with UDP, determining outgoing interface with UDP, TCP and UDP echo server using *select*.

## UNIT-VI

**ELEMENTARY NAME AND ADDRESS CONVERSIONS:** DNS, *gethostbyname* function, Resolver option, *gethostbyname2* function and IPV6 support, *uname* function, *getserverbyname* and *getservbyport* functions, other networking information.

## UNIT-VII

**IPC :** Introduction, File and record locking, Pipes, FIFOs, streams and messages, Name spaces, system V IPC, Message queues, Semaphores, Shared memory.

## UNIT-VIII

**REMOTE LOGIN:** Terminal line disciplines, Pseudo-Terminals, Terminal modes, Control Terminals, rlogin Overview, RPC Transparency Issues.

## TEXT BOOKS:

1. W.Richard Stevens, Bill Fenner, Andrew M. Rudoff “UNIX Network Programming, The sockets Networking API”, Volume 1, 3<sup>rd</sup> Edition, Pearson Edn. Asia, 2004.
2. W.Richard Stevens, “UNIX Network Programming”, 1<sup>st</sup> Edition, PHI. 1995.

## REFERENCE BOOKS:

1. T Chan, “UNIX Systems Programming using C++”, 1<sup>st</sup> Edition, PHI, 2010.
2. Graham Glass, King abls, “UNIX for Programmers and Users”, 3<sup>rd</sup> Edition, Pearson Education, 2010.
3. M. J. Rochkind, “Advanced UNIX Programming”, 2<sup>nd</sup> Edition, Pearson Education, 2008.



## BIO-INFORMATICS

(ELECTIVE-I)

(Common to CSE & IT)

**Course Code: ACT1133**

L	T	P	C
4	1	0	4

Pre-requisite: None

### AIM:

To teach students concepts of Bio-informatics and its applications in engineering field.

### OBJECTIVE:

To provide conceptual understanding of protein and Genome IS, alignment techniques and database searching, analysis.

### UNIT-I

**INTRODUCTION:** Definitions, Sequencing, Biological sequence/ structure, Genome Projects, Pattern recognition and prediction, Folding problem, Sequence Analysis, Homology and Analogy.

### UNIT-II

**PROTEIN INFORMATION RESOURCES:** Biological databases, Primary sequence databases, Protein Sequence databases, Secondary databases, Protein pattern databases, and Structure classification databases.

### UNIT-III

**GENOME INFORMATION RESOURCES:** DNA sequence databases, specialized genomic resources

### UNIT-IV

**DNA SEQUENCE ANALYSIS:** Importance of DNA analysis, Gene structure and DNA sequences, Features of DNA sequence analysis, EST (Expressed Sequence Tag) searches, Gene hunting, Profile of a cell, EST analysis, Effects of EST data on DNA databases.

## UNIT-V

**PAIR WISE ALIGNMENT TECHNIQUES :** Database searching, Alphabets and complexity, Algorithm and programs, Comparing two sequences, sub-sequences, Identity and similarity, The Dotplot, Local and global similarity, different alignment techniques, Dynamic Programming, Pair wise database searching.

## UNIT-VI

**MULTIPLE SEQUENCE ALIGNMENT :** Definition and Goal, The consensus, computational complexity, Manual methods, Simultaneous methods, Progressive methods, Databases of Multiple alignments and searching.

## UNIT-VII

**SECONDARY DATABASE SEARCHING :** Importance and need of secondary database searches, secondary database structure and building a sequence search protocol.

## UNIT-VIII

**ANALYSIS PACKAGES :** Analysis package structure, commercial databases, commercial software, comprehensive packages, packages specializing in DNA analysis, Intranet Packages, Internet Packages.

### TEXT BOOKS:

1. T K Attwood & D J Parry-Smith Addison, "Introduction to Bioinformatics", 1<sup>st</sup> Edition, Wesley Longman, 2008.

### REFERENCE BOOKS:

1. Arthur M.Lesk, "Introduction to Bioinformatics", 1<sup>st</sup> Edition, OXFORD publishers (Indian Edition), 2002.
2. Jean-Michel Claveriw, Cerdric Notredame, "Bioinformatics- A Beginner's Guide", 1<sup>st</sup> Edition, WILEY dreamtech India Pvt. Ltd, 2007.



# INFORMATION STORAGE SYSTEMS

(ELECTIVE-I)

(Common to CSE & IT)

**Course Code: ACT1135**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>1</b>	<b>0</b>	<b>4</b>

Pre-requisite: Databases Management Systems

## AIM:

To describe the challenges found in today's complex information management environment.

## OBJECTIVES :

1. Describe storage technology solutions
2. Describe common storage management and roles
3. Understand the concept of information availability and its measurement

## UNIT-I

**INTRODUCTION TO INFORMATION STORAGE AND MANAGEMENT OF INFORMATION STORAGE :** Data, Types of Data, Information, Storage. Evolution of Storage Technology and Architecture. Data Center Infrastructure: Core Elements, Key Requirements for Data Center Elements, Managing Storage Infrastructure. Key Challenges in Managing Information. Information Lifecycle: Information Lifecycle Management, ILM Implementation, ILM Benefits, .Summary.

## UNIT-II

**STORAGE SYSTEM ENVIRONMENT** Components of a Storage System Environment: Host, Connectivity, Storage. Disk Drive Components: Platter Spindle, Read/Write Head, Actuator Arm Assembly, Controller, Physical Disk Structure, Zoned Bit Recording, Logical Block Addressing. Disk Drive Performance: Disk Service Time. Fundamental Laws Governing Disk Performance, Logical Components of the Host: Operating System,

Device Driver, Volume Manager, File System, Application. Application Requirements and Disk Performance, Summary.

### UNIT-III

**DATA PROTECTION :** RAID, Implementation of RAID: Software RAID, Hardware RAID, RAID Array Components. RAID Levels: Striping, Mirroring , Parity , RAID 0, RAID 1, Nested RAID , RAID, RAID 4, RAID 5, RAID 6, RAID Comparison. RAID Impact on Disk Performance: Application IOPS and RAID Configurations: Hot Spares, Summary.

### UNIT-IV

**INTELLIGENT STORAGE SYSTEM** Components of an Intelligent Storage System: Front End , Cache, Back End , Physical Disk. Intelligent Storage Array: High-end Storage Systems , Midrange Storage System. Concepts in Practice: EMC CLARiiON and Symmetrix: CLARiiON Storage Array, CLARiiON CX4 Architecture ,Managing the CLARiiON, Symmetrix Storage Array, Symmetrix Component Overview, Direct Matrix Architecture, Summary.

### UNIT-V

**DIRECT-ATTACHED STORAGE AND INTRODUCTION TO SCSI** Types of DAS, Internal DAS, External DAS. DAS Benefits and Limitations. Disk Drive Interfaces, IDE/ATA, SATA, Parallel SCSI. Introduction to Parallel SCSI: Evolution of SCSI , SCSI Interfaces, SCSI-3 Architecture, Parallel SCSI Addressing. SCSI Command Model, CDB Structure, Operation Code, Control Field, Status, Summary.

### UNIT-VI

**STORAGE AREA NETWORKS** Fibre Channel: Overview, The SAN and Its Evolution, Components of SAN: Node Ports, Cabling, Interconnect Devices , Storage Arrays , SAN Management Software. FC Connectivity: Point-to-Point , Fibre Channel Arbitrated Loop, Fibre Channel Switched Fabric. Fibre Channel Ports. Fibre Channel Architecture, Fibre Channel Protocol Stack, Fibre Channel Addressing, FC Frame, Structure and Organization of FC Data, Flow Control, Classes of

Service, Zoning, Fibre Channel Login Types. FC Topologies. Core-Edge Fabric; Mesh Topology, Concepts in Practice: EMC Connectrix, Summary.

## UNIT-VII

**NETWORK-ATTACHED STORAGE** General-Purpose Servers vs. NAS Devices. Benefits of NAS. NAS File I/O: File Systems and Remote File Sharing , Accessing a File System , File Sharing. Components of NAS . NAS Implementations: Integrated NAS, Gateway NAS , Integrated NAS Connectivity , Gateway NAS Connectivity. NAS File-Sharing Protocols: NFS, CIFS. NAS I/O Operations :Hosting and Accessing Files on NAS. Factors Affecting NAS Performance and Availability. Concepts in Practice: EMC Celerra : Architecture, Celerra Product Family, Summary.

## UNIT-VIII

**IP SAN** iSCSI: Components of iSCSI, iSCSI Host Connectivity , Topologies for iSCSI Connectivity, iSCSI Protocol Stack, iSCSI Discovery , iSCSI Names , iSCSI Session, iSCSI PDU, Ordering and Numbering , iSCSI Error Handling and Security .FCIP: FCIP Topology, FCIP Performance and Security, Summary.

### TEXT BOOKS:

1. G. Somasundaram, A. Shrivastava : EMC Corporation, “Information Storage and Management”, 1<sup>st</sup> Edition, Wiley Publication,2009.
2. Robert Spalding, “Storage Networks: The Complete Reference”, 1<sup>st</sup> Edition, Tata McGraw Hill/Osborne, 2003.

### REFERENCE BOOKS:

1. Marc Farley, “Building Storage Networks”, 2<sup>nd</sup> Edition, Tata McGraw Hill/Osborne, 2001.
2. Meeta Gupta: “Storage Area Network Fundamentals”, 1<sup>st</sup> Edition, Pearson Education, 2002.





## ELECTRICAL SAFETY MANAGEMENT

(ELECTIVE I)

(Common to all branches)

Pre-requisites: None

**Course Code: AEE1140**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>1</b>	<b>0</b>	<b>4</b>

### AIM :

To familiarize the student with Electrical Safety in hazardous areas and to provide basic precautions in engineering practices.

### OBJECTIVE :

To understand various electrical rules and acts, safety precautions in electrical systems

### UNIT-I

**INTRODUCTION TO ELECTRICAL SAFETY** : Terms and definitions, objectives of safety and security measures, Hazards associated with electric current, and voltage, who is exposed, principles of electrical safety, Approaches to prevent accidents, scope of subject electrical safety, fire prevention and fire fighting.

### UNIT-II

#### **ELECTRICAL SHOCKS THEIR PREVENTION AND FIRST**

**AID** : Primary and secondary electrical shocks, possibilities of getting electrical shock and its severity, medical analysis of electric shocks and its effects, shocks due to flash/ spark overs, prevention of shocks, safety precautions against contact shocks, flash shocks, burns, residential buildings and shops.

First Aid: first principles of actions after electric shocks, Artificial respiration, External Cardiac massage, Control of bleeding, burns and scalds and Heat exhaustion.

### UNIT-III

#### **ELECTRICAL SAFETY IN RESIDENTIAL, COMMERCIAL**

**AND AGRICULTURAL INSTALLATIONS :** Wiring and fitting – Domestic appliances – water tap giving shock – shock from wet wall – fan firing shock – multi-storied building – Temporary installations – Agricultural pump installation – Do's and Don'ts for safety in the use of domestic electrical appliances.

### UNIT-IV

#### **SAFETY DURING INSTALLATION, TESTING AND COMMISSIONING, OPERATION AND MAINTENANCE :**

Preliminary preparations – safe sequence – risk of plant and equipment – safety documentation – field quality and safety - personal protective equipment – safety clearance notice – safety precautions – safeguards for operator's safety.

### UNIT-V

#### **ELECTRICAL SAFETY IN HAZARDOUS AREAS :**

Hazardous zones – class 0,1 and 2 – spark, flashovers and corona discharge and functional requirements – Specifications of electrical plants, equipments for hazardous locations – Classification of equipment enclosure for various hazardous gases and vapours – classification of equipment/enclosure for hazardous locations.

### UNIT-VI

#### **EQUIPMENT EARTHING AND SYSTEM NEUTRAL**

**EARTHING:** Introduction, Distinction between system grounding and Equipment Grounding, Equipment Earthing, Functional Requirement of earthing system, description of a earthing system, , neutral grounding( System Grounding), Types of Grounding, Methods of Earthing Generators Neutrals.

### UNIT-VII

#### **SAFETY MANAGEMENT OF ELECTRICAL SYSTEMS :**

Principles of Safety Management, Management Safety Policy, Safety organization, safety auditing, Motivation to managers, supervisors, employees.

## UNIT-VIII

**REVIEW OF IE RULES AND ACTS AND THEIR SIGNIFICANCE :** Objective and scope – ground clearances and section clearances – standards on electrical safety - safe limits of current, voltage – earthing of system neutral – Rules regarding first aid and fire fighting facility.

The Electricity ACT, 2003, (Part 1, 2, 3,4 & 5)

### TEXT BOOKS :

1. S. Rao, Prof. H.L. Saluja, “Electrical safety, fire safety Engineering and safety management”, Khanna Publishers. New Delhi, 1988.
2. Pradeep Chaturvedi, “Energy management policy, planning and utilization”, Concept Publishing company, New Delhi, 1997.
3. [www.apeasternpower.com/downloads/elecact2003.pdf](http://www.apeasternpower.com/downloads/elecact2003.pdf)



## NON CONVENTIONAL SOURCES OF ENERGY

(ELECTIVE I)

(Common to all branches)

Pre-requisites: None

Course Code: AME1135

L	T	P	C
4	1	0	4

### AIM:

To introduce and familiarize the student with the various renewable sources of energy.

### OBJECTIVE:

Renewable sources of energy is an area of research and development especially for countries like India. So the student should be in a position to take up small scale projects, as entrepreneurs, since the cost of investment is minimal in some cases.

### UNIT-I

Introduction to various renewable sources of energy.

**SOLAR RADIATIONS :** Extra terrestrial radiation, Spectral distribution, Solar constant, Solar radiations on earth, Measurement of solar radiations, Solar radiation geometry, Longitude, Latitude, Declination angle, Surface azimuth angle, Hour angle, Zenith angle, Solar altitude angle expression for angle between incident beam and the normal to a plane surface (no derivation), Local apparent time, Apparent motion of sun, Day length, Solar radiation data for India.

### UNIT-II

**SOLAR ENERGY :** Solar thermal power and its conversion, Solar collectors, Flat plate, Performance analysis of flat plate collector, Solar concentrating collectors, Types of concentrating collectors, Cylindrical collectors, Thermal analysis of solar collectors, Tracking CPC and solar swing . Solar thermal energy storage, Different systems, Solar pond. Applications - Water heating, Space heating & cooling, Solar distillation, solar pumping, solar cooking, Greenhouses, Solar power plants.

**SOLAR PHOTOVOLTAIC SYSTEM :** Photovoltaic effect, Efficiency of solar cells, Semiconductor materials for solar cells, Solar photovoltaic system, Standards of solar photovoltaic system, Applications of PV system, PV hybrid system.

### UNIT-III

**WIND ENERGY :** Properties of wind, Availability of wind energy in India, wind velocity, Wind machine fundamentals, Types of wind machines and their characteristics, Horizontal and Vertical axis wind mills, Elementary design principles, performance characteristics, Betz criteria Coefficient of performance of a wind mill rotor, Aerodynamic considerations in wind mill design, Selection of a wind mill, Wind energy farms, Economic issues, Recent developments.

### UNIT-IV

**BIO-MASS AND BIO-GAS :** Principles of Bio-Conversion, Photosynthesis, Bio gas production, Aerobic and anaerobic bio-conversion process, Raw materials, Properties of bio gas, Producer gas, Transportation of bio gas, bio gas plant technology & status, Community biogas plants, Problems involved in bio gas production, Bio gas applications, Biomass conversion techniques, Biomass gasification, Energy recovery from urban waste, Power generation from liquid waste, Biomass cogeneration, Energy plantation, Fuel properties, Biomass resource development in India.

### UNIT-V

**OCEAN ENERGY :** Principle of ocean thermal energy conversion, Wave energy conversion machines, Power plants based on ocean energy, Problems associated with ocean thermal energy conversion systems, Thermoelectric OTEC, Developments of OTEC.

**TIDAL POWER :** Tides and waves as sources of energy, Fundamentals of tidal power, Use of tidal energy, Limitations of tidal energy conversion systems.

### UNIT-VI

**GEOTHERMAL ENERGY :** Structure of earth's interior, Geothermal sites, earthquakes & volcanoes, Geothermal resources, Hot springs, Steam ejection, Principle of working, Types of geothermal station with

schematic representation, Site selection for geothermal power plants. Advanced concepts, Problems associated with geothermal conversion.

## **UNIT-VII**

**ELECTROCHEMICAL EFFECTS AND FUEL CELLS :** Principle of operation of an acidic fuel cell, Reusable cells, Ideal fuel cells, Other types of fuel cells, Comparison between acidic and alkaline hydrogen-oxygen fuel cells, Efficiency and EMF of fuel cells, Operating characteristics of fuel cells, Advantages of fuel cell power plants, Future potential of fuel cells.

**HYDROGEN ENERGY :** Properties of hydrogen in respect of its use as source of renewable energy, Sources of hydrogen, Production of hydrogen, Storage and transportation, Problems with hydrogen as fuel, Development of hydrogen cartridge, Economics of hydrogen fuel and its use.

## **UNIT-VIII**

**DIRECT ENERGY CONVERSION :** Need for DEC, Carnot cycle, limitations, Principles of DEC. Thermo-electric generators, Seebeck, Peltier and Joule-Thompson effects, figure of merit, materials, applications, MHD generators, principles, dissociation and ionization, Hall effect, magnetic flux, MHD accelerator, MHD engine, power generation systems, electron gas dynamic conversion, economic aspects.

### **TEXT BOOKS:**

Rai G.D, “Non-Conventional energy Sources”, Khanna Publishers, Fourth Edition, 2008.

### **REFERENCE BOOKS:**

Kothari D.P., “Renewable Energy Resources and Emerging Tech.”, Prentice Hall of India Pvt. Ltd, 1<sup>st</sup> Edition, 1990.



# INFORMATION RETRIEVAL SYSTEMS

(ELECTIVE-II)

(Common to CSE & IT)

**Course Code: ACT1125**

L	T	P	C
4	1	0	4

Pre-requisite: Databases Management Systems

## AIM:

To introduce fundamental concepts of information retrieval and the procedures for evaluating information retrieval tools.

## OBJECTIVE:

To give a detailed understanding of the working of information retrieval tools and make students capable of developing their own information retrieval systems.

## UNIT-I

**BOOLEAN RETRIEVAL:** An example information retrieval problem, A first take at building an inverted index, Processing Boolean queries, The extended Boolean model versus ranked retrieval.

## UNIT-II

**THE TERM VOCABULARY AND POSTINGS LISTS:** Document delineation and character sequence decoding, Obtaining the character sequence in a document, Choosing a document unit, Determining the vocabulary of terms, Tokenization, Dropping common terms: stop words, Normalization (equivalence classing of terms) stemming and lemmatization, Faster postings list intersection via skip pointers, Positional postings and phrase queries, Biword indexes, Positional indexes, Combination schemes

## UNIT-III

**DICTIONARIES AND TOLERANT RETRIEVAL:** Search structures for dictionaries, Wildcard queries, General wildcard queries,

*k*-gram indexes for wildcard queries, Spelling correction , Implementing spelling correction, Forms of spelling correction , Edit distance , *k*-gram indexes for spelling correction, Context sensitive spelling correction, Phonetic correction .

#### UNIT-IV

**INDEX CONSTRUCTION :** Hardware basics , Blocked sort-based indexing , Single-pass in-memory indexing , Distributed indexing , Dynamic indexing , Other types of indexes

#### UNIT-V

**INDEX COMPRESSION :** Statistical properties of terms in information retrieval, Heaps' law: Estimating the number of terms , Zipf's law: Modeling the distribution of terms , Dictionary compression , Dictionary as a string , Blocked storage , Postings file compression, Variable byte codes ,  $\tilde{a}$  codes .

#### UNIT-VI

**SCORING, TERM WEIGHTING :** Parametric and zone indexes, Weighted zone scoring, Learning weights, The optimal weight  $g$ , Term frequency and weighting , Inverse document frequency, Tf-idf weighting.

#### UNIT-VII

**THE VECTOR SPACE MODEL :** The vector space model for scoring, Dot products , Queries as vectors , Computing vector scores, Variant tf-idf functions , Sublinear tf scaling, Maximum tf normalization, Document and query weighting schemes , Pivoted normalized document length

#### UNIT-VIII

**EVALUATION IN INFORMATION RETRIEVAL :** Information retrieval system evaluation , Standard test collections , Evaluation of unranked retrieval sets , Evaluation of ranked retrieval results, Assessing relevance , Critiques and justifications of the concept of Relevance, A broader perspective: System quality and user utility , System issues , User utility , Refining a deployed system, Results snippets



**TEXT BOOKS:**

1. Christopher D. Manning, Prabhakar Raghavan, Hinrich Schütze, “An Introduction to Information Retrieval”, 1<sup>st</sup> Edition, Cambridge University Press, 2008.

**REFERENCE BOOKS:**

1. G.G. Chowdhury, “Introduction to Modern Information Retrieval”, 1<sup>st</sup> Edition, neal-schuman publishers, 2010.
2. Gerald J.Kowalski, Mark T.Maybury, “Information Storage and Retrieval systems : Theory and Implementation”, 2<sup>nd</sup> Edition, Kluwer Academic Publishers, 2009.



## CLIENT-SERVER COMPUTING

### (ELECTIVE-II)

**Course Code: ACS1108**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>1</b>	<b>0</b>	<b>4</b>

#### **AIM :**

To give an exposure on various aspects of Client-Server Computing Applications.

#### **OBJECTIVE:**

Students will be able to learn basic concepts of client-server computing. They will apply the techniques and features of a client-server development environment to construct a moderately complex client-server application.

#### **UNIT-I**

**INTRODUCTION TO CLIENT/SERVER COMPUTING:** Single System Image, Client Server Computing, mainframe-centric client server computing, downsizing and client server computing, preserving mainframe applications investment through porting, client server development tools.

#### **UNIT-II**

**ADVANTAGES OF CLIENT SERVER COMPUTING :** The advantages of client server computing, Technology Revolution, Connectivity, User Productivity, ways to improve performance, how to reduce network traffic, vendor independence, faster delivery of systems.

#### **UNIT-III**

**COMPONENTS OF CLIENT/SERVER APPLICATION-THE CLIENT, THE SERVER :** Role of the client, Client services, request for services, role of the server, Detailed server functionality, the network operating system, available platforms, the server operating system.

#### **UNIT-IV**

**COMPONENTS OF CLIENT/SERVER APPLICATIONS-CONNECTIVITY :** Open Systems Inter connection, communication

interface technology, Interprocess communication, wide area network technologies.

## UNIT-V

### **CLIENT-SERVER SYSTEMS DEVELOPMENT-SOFTWARE:**

Factors for Application Software Development, improving technology , platform migration, common interface across platforms, client/server systems development methodology, project management, architecture definition, systems development environment.

## UNIT-VI

### **CLIENT-SERVER SYSTEMS DEVELOPMENT- HARDWARE:**

Hardware/Network Acquisition, PC-level processing unit, Macintosh, notebooks, pen, UNIX workstation, x-terminals, server hardware, Data Storage, magnetic disk, mirrored disk , RAID-Disk array and others , network interface cards, Token ring, Ethernet, FDDI, CDDI, Power protection devices, uninterruptable power supply.

## UNIT-VII

### **CLIENT SERVER SYSTEMS DEVELOPMENT-SERVICES**

**AND SUPPORT:** system administration, Availability, Reliability, Serviceability, Software Distribution, Performance, Network management, Remote Systems Management, Security, LAN and Network Management issues.

Client/Server System Development: Training, Training advantages of GUI Application, System Administrator training, Database Administrator training, End-user training.

## UNIT-VIII

### **THE FUTURE OF CLIENT SERVER COMPUTING:**

Enabling Technologies, expert systems, Geographic information systems, point-of-service, imaging, electronic document management, fulltext retrieval, transformational systems.

### **TEXT BOOK:**

1. Patrick Smith & Steave Guengerich, “Client / Server Computing”, 2<sup>nd</sup> Edition, PHI, 2011.

---

**REFERENCE BOOKS:**

1. Dawna Travis Dewire, “Client/Server Computing”, 1<sup>st</sup> Edition, TMH, 2005.
2. Yadav, Subhash Chandra, Singh, Sanjay Kumar, “An Introduction to Client/Server Computing”, 1<sup>st</sup> Edition, New Age International Publication, 2009.



# SOFTWARE PROJECT MANAGEMENT

(ELECTIVE-II)  
(Common to CSE & IT)

**Course Code: ACT1126**

L	T	P	C
4	1	0	4

Pre-requisite: Software Engineering

## AIM:

To make the students understand how to manage software projects.

## OBJECTIVES:

- To understand the draw backs of traditional project management methods.
- To understand the principles of modern software project management.

## UNIT-I

**CONVENTIONAL SOFTWARE MANAGEMENT:** The waterfall model, conventional software Management performance. Evolution of Software Economics : Software Economics, pragmatic software cost estimation.

## UNIT-II

**IMPROVING SOFTWARE ECONOMICS :** Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections. The old way and the new : The principles of conventional software Engineering, principles of modern software management, transitioning to an iterative process.

## UNIT-III

**LIFE CYCLE PHASES :** Engineering and production stages, inception, Elaboration, construction, transition phases. Artifacts of the process : The artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts.

## UNIT-IV

**MODEL BASED SOFTWARE ARCHITECTURES** : A Management perspective and technical perspective. Work Flows of the process : Software process workflows, Iteration workflows.

## UNIT-V

**CHECKPOINTS OF THE PROCESS** : major milestones, minor milestones, periodic status assessments. Iterative Process Planning: Work breakdown structures, planning guidelines, cost and schedule estimating, iteration planning process, pragmatic planning.

## UNIT-VI

**PROJECT ORGANIZATIONS AND RESPONSIBILITIES**: Line-of-Business Organizations, Project Organizations, evolution of Organizations. Process Automation : Automation Building blocks, The Project Environment.

## UNIT-VII

**PROJECT CONTROL AND PROCESS INSTRUMENTATION**: The seven core Metrics, Management indicators, quality indicators, life cycle expectations, pragmatic Software Metrics, Metrics automation. Tailoring the Process: Process discriminates.

## UNIT-VIII

**FUTURE SOFTWARE PROJECT MANAGEMENT** : Modern Project Profiles, Next generation Software economics, modern process transitions. Case Study: The command Center Processing and Display system- Replacement (CCPDS-R)

### TEXT BOOK:

1. Walker Royce, “Software Project Management”, 1<sup>st</sup> Edition, Pearson Education, 2006.

### REFERENCE BOOKS:

1. Bob Hughes and Mike Cotterell, “Software Project Management”, 4<sup>th</sup> Edition, Tata McGraw Hill, 2008.
2. Joel Henry, “Software Project Management: A Real World Guide to Success”, 1<sup>st</sup> Edition, Pearson Education, 2008.



## DIGITAL FORENSICS

(ELECTIVE II)

(Common to CSE & IT)

**Course Code: ACT1136**

L	T	P	C
4	1	0	4

### AIM

To introduce the students to the latest information technology threats and their counter measures

### OBJECTIVE

To make student aware of the forensic analysis techniques to protect e-mail, online transactions and secure information transmission over the network

### UNIT-I

**WINDOWS LIVE RESPONSE :** Analyzing Volatile Data, The System Date and Time, Current Network Connections, Open TCP or UDP Ports, Executables Opening TCP or UDP Ports, Cached NetBIOS Name Tables, Users Currently Logged On, The Internal Routing Table, Running Processes, Running Services, Scheduled Jobs, Open Files, Process Memory Dumps, Full System Memory Dumps, Analyzing Nonvolatile Data, System Version and Patch Level, File System Time and Date Stamps, Registry Data, The Auditing Policy, A History of Logins, System Event Logs, User Accounts, IIS Logs, Suspicious Files, Putting it all together.

**UNIX LIVE RESPONSE :** Analyzing Volatile Data, The System Date and Time, Current Network Connections, Open TCP or UDP Ports, Executables Opening TCP or UDP Ports, Running Processes, Open Files, The Internal Routing Table, Loaded Kernel Modules, Mounted File Systems, Analyzing Nonvolatile Data, System Version and Patch Level, File System Time and Date Stamps, File System MD5 Checksum Values, Users Currently Logged On, A History of Logins, Syslog Logs, User Accounts, User History Files, Suspicious Files, Putting it all together.

## UNIT-II

**COLLECTING NETWORK-BASED EVIDENCE :** Full Content Data, Session Data, Alert Data, Statistical Data, Putting NBE to Work, A Standard Intrusion Scenario, Using Full Content Data, Using Session Data, Using Alert Data, Using Statistical Data, Data Collection, Accessing the Wire, Collecting and Storing Traffic, Full Content Data Tools, Session Data Tools, Alert Data Tools, Statistical Data Tools, Putting it all together.

**ANALYZING NETWORK-BASED EVIDENCE FOR A WINDOWS INTRUSION :** Statistical Data: First Trace, Alert Data: First Trace, Session Data: First Trace, Full Content Data: First Trace, Statistical Data: Second Trace, Alert Data: Second Trace, Session Data: Second Trace, Full Content Data: Second Trace, Putting it all together.

**ANALYZING NETWORK-BASED EVIDENCE FOR A UNIX INTRUSION :** Statistical Data, Alert Data, Session Data, Full Content Data, Putting it all together.

## UNIT-III

**BEFORE YOU JUMP RIGHT IN...,** Preparing for a Forensic Duplication, Document, Document, Document!

**COMMERCIAL-BASED FORENSIC DUPLICATIONS :** The Read-Only IDE-to-Fire, wire Device, Acquiring a Forensic Duplication with EnCase, Acquiring a Forensic Duplication with FTK

**NONCOMMERCIAL-BASED FORENSIC DUPLICATIONS :** DD, Creating an Evidence File, Creating an Evidence Hard Drive.DD Rescue, DCFLDDNED-The Open Source Network Evidence Duplicator

## UNIT-IV

**COMMON FORENSIC ANALYSIS TECHNIQUES :** Recovering Deleted Files, Open Source Solutions, Commercial Solutions, Production of Time Stamps and Other Metadata for Files, Open Source Solutions, Commercial Solutions, Removing Known Files, Open Source Solutions, Commercial Solutions, File Signatures and Electronic Discovery, Open Source Solutions, Commercial Solutions, String Searching and File Fragments, Open Source Solutions, Commercial Solutions



**WEB BROWSING ACTIVITY RECONSTRUCTION :** Commercial Forensic Tools, Open Source Solutions, Pasco-An Open Source Web Browsing Investigation Tool, Galleta-An Open Source IE Cookie Investigation Tool, Putting It All Together

## UNIT-V

**E-MAIL ACTIVITY RECONSTRUCTION :** Commercial Forensic Tools, Open Source Solutions, Outlook Express

### **Microsoft Windows Registry Reconstruction**

Identifying Installed Programs, Identifying “Most Recently Used” Documents.

### **Forensic Tool Analysis: An Introduction to Using Linux for Analyzing Files of Unknown Origin,**

Case Background

A Hands-On Introduction to Forensic Tool Analysis: Hello World!

Static Analysis of Hello, Dynamic Analysis of Hello, Putting It All Together

## UNIT-VI

**FORENSIC TOOL ANALYSIS:** A Hands-On Analysis of the Linux File aio

Static Analysis of aio,md5sum,ls -al,file,strings,Hexadecimal Viewer,nm,ldd,readelf,objdump,Dynamic Analysis of aio,System Call Trace (strace),GNU Debugger,Recovering the Uncompressed aio Binary,Recovery by Identifying the Packer That Was Used,Static Analysis of the Recovered Uncompressed Binary,Dynamic Analysis of the Recovered Uncompressed Binary,md5sum,Putting It All Together

**CREATING A COMPLETE FORENSIC TOOL KIT** Building the Ultimate Response CD

Preparing the Windows Live Response Tools,Preparing the Unix Live Response Tools,Forensic Duplication Tools,DCFLDD,NED

## UNIT-VII

**FORENSIC DUPLICATION AND ANALYSIS OF PERSONAL DIGITAL ASSISTANTS :** Case Background,Forensic Acquisition, Utilizing EnCase,Initial Setup,EnCase,Forensic Acquisition Utilizing

Paraben's PDA Seizure, Forensic Acquisition Utilizing Palm Debugger, Forensic Analysis of the Palm IIIc, Forensic Analysis of the HP iPAQ Pocket PC 2003, Forensic Analysis of the Palm m505, Putting it all together.

### **FORENSIC DUPLICATION OF USB AND COMPACT FLASH MEMORY DEVICES :** Duplicating USB Devices, Duplicating Compact Flash Cards

Forensic Analysis of USB and Compact Flash Memory Devices

USB Memory Devices, Open Source Solutions, Commercial Solutions, Compact Flash Cards, Open Source Solutions, Commercial Solutions, Online-Based Forensics

### **UNIT-VIII**

**TRACING E-MAIL :** Hotmail, Yahoo!, Netscape, Other E-Mail Services, Anonymous Remailers

**DOMAIN NAME OWNERSHIP :** Importing the TLD Zone Files into Postgres, Translating FQDNs to IP Addresses, Searching for Domains, Searching for DNSs, An Introduction to Perl, Reading Input, Matching Text, Regular Expressions, Formatting Output, Processing Live IR Data Collected, The Date Problem with Microsoft Excel

### **TEXT BOOK:**

1. Keith J. Jones, Richard Bejtlich, Curtis Rose, "Real Digital Forensics : Computer Security and Incident Response", 1<sup>st</sup> Edition, Addison Wesley Pearson Education, 2008.

### **REFERENCE BOOKS:**

1. John R. Vacca, "Computer Forensics: Computer Crime Scene Investigation", 1<sup>st</sup> Edition, Firewall Media, 2006.
2. Christopher L.T. Brown, "Computer Evidence Collection and Preservation", 2<sup>nd</sup> Edition, Firewall Media, 2009.



## SATELLITE COMMUNICATION

(ELECTIVE – II)

(Common to all branches)

**Pre-requisites: None**

**Course Code: AEC1132**

L	T	P	C
4	1	0	4

### AIM:

Students will learn Satellite Systems and Communications applications comprehensively and apply this knowledge for understanding the existing Modern Satellite Applications.

### OBJECTIVE:

The flow of the syllabus enables students to understand the subject from basics to advanced technologies on Satellite Communications and get prepared for Industry and will not be needing extensive training on these aspects.

### UNIT-I

**SATELLITE ORBITS** : Kepler's Laws, Newton's law, orbital parameters, orbital perturbations, station keeping, geo stationary and non Geo-stationary orbits – Look Angle Determination- Limits of visibility – eclipse-Sub satellite point –Sun transit outage-Launching Procedures - launch vehicles and propulsion.

### UNIT-II

**SPACE SEGMENT** : Spacecraft Technology- Structure, Primary power, Attitude and Orbit control, Thermal control and Propulsion, communication Payload and supporting subsystems, Telemetry, Tracking and command.

### UNIT-III

**EARTH SEGMENT** : Earth Station Technology— Terrestrial Interface, Transmitter and Receiver, Antenna Systems TVRO, MATV, CATV, Test Equipment Measurements on G/T, C/No, EIRP, Antenna Gain.

#### UNIT-IV

**SATELLITE LINK DESIGN** : Satellite uplink and downlink Analysis and Design, link budget, E/N calculation- performance impairments- system noise, inter modulation and interference, Propagation Characteristics and Frequency considerations- System reliability and design lifetime.

#### UNIT-V

**SATELLITE ACCESS** : Modulation and Multiplexing: Voice, Data, Video, Analog – digital transmission system, Digital video Broadcast, multiple access: FDMA, TDMA, CDMA, Assignment Methods, Spread Spectrum communication, compression – encryption.

#### UNIT-VI

**SATELLITE APPLICATIONS-COMMUNICATIONS** : INTELSAT Series, INSAT, VSAT, Mobile satellite services: GSM, GPS, INMARSAT, LEO, MEO, Satellite Navigational System. Specialized services – E –mail, Video conferencing, Internet.

#### UNIT-VII

**PRINCIPLES OF TV & BROADCASTING**: Gross structure, Image continuity, Scanning, flicker, interlaced scanning, number of scanning lines, Fine structure, Tonal Gradation. Video signal dimensions, Horizontal sync. details, Vertical sync. details, Scanning sequence details, Functions of vertical pulse train, Channel bandwidth, vestigial side band transmission, bandwidth allocations for colour transmission.

#### UNIT-VIII

**SATELLITE APPLICATIONS-BROADCAST** : Direct Broadcast satellites (DBS)- Direct to home Broadcast (DTH), Digital audio broadcast (DAB)- World space services, Business TV(BTV), GRAMSAT.

#### TEXT BOOKS:

1. Tri T. Ha, “Digital Satellite Communication”, II Edition, McGraw-Hill, 1990.
2. R R Gulati , “Monochrome and Colour Television”, New Age International,2007.

---

**REFERENCE BOOKS:**

1. M. Richharia, "Satellite Communication Systems-Design Principles", Macmillan 2003
2. N.Agarwal, "Design of Geosynchronous Space Craft", Prentice Hall, 1986.
3. Bruce R. Elbert, "The Satellite Communication Applications" Hand Book, Artech House Boston London, 1997.
4. Wilbur L. Pritchard, Hendri G. Suyderhoud, Robert A. Nelson, "Satellite Communication Systems Engineering", Prentice Hall, Pearson, 2007.



## ARCHITECTURAL PLANNING OF BUILDINGS

(ELECTIVE II)

(Common to all branches except Civil Engineering)

**Pre-requisites: None**

**Course Code: ACE 1152**

L	T	P	C
4	1	0	4

### AIM :

To understand the various planning principles and have basic knowledge on building drawing.

### OBJECTIVE :

Student shall have basic knowledge of different building bye-laws. The student shall have basic understanding on various planning principles of residential buildings.

### UNIT-I

**VAASTU :** Introduction – Principles of Vaastu – Vaastu grouping of rooms – preferences of vaastu aspects of rooms – General vaastu for common items like well (Bore), septic tank, water tank, gates etc.

### UNIT-II

**BUILDING BYELAWS AND REGULATIONS:** Introduction – Terminology – Objectives of building byelaws – Building byelaws as per Municipal norms - Floor area ratio (FAR) – Floor space Index (FSI) – Principles underlying building byelaws – classification of bye buildings – Open space requirements – built up area limitations – Height of Buildings – Wall thickness.

### UNIT-III

**RESIDENTIAL BUILDINGS:** Minimum standards for various parts of buildings – requirements of different rooms and their grouping – characteristics of various types of residential buildings.

## UNIT-IV

**STAIR CASES :** Terms used in stair cases – classification of stairs – minimum requirements of stair case – stairs spanning horizontally and longitudinally.

## UNIT-V

**PLANNING OF A RESIDENTIAL BUILDING :** Planning of two storied residential building – planning of a duplex building.

## UNIT-VI

**BUILDING AUTOMATION SYSTEM - I :** Components of building automation system - Security, fire-fighting, communication etc.,

## UNIT-VII

**BUILDING AUTOMATION SYSTEM - II :** Components of building automation system - HVAC, electrical lighting.

## UNIT-VIII

**AIR CONDITIONING:** Components of the Building air condition system – tonnage of air condition requirements – requirements for better air conditioning.

## TEXT BOOKS:

1. 'A' Series & 'B' Series of JNTU Engineering College, Anantapur,
2. Kumarswamy N and Kameswara Rao A, "Building Planning and Design", Oxford Publishers, 2001.
3. Gurucharan Singh, "Building Planning Scheduling and Design", Dhanpat Rai Publications, 1996.

## REFERENCE BOOKS:

1. Building Byelaws by State and Central Governments and Municipal Corporations.



## EMBEDDED SYSTEMS LAB

**Course Code: ACS1109**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>3</b>	<b>2</b>

### **AIM:**

To teach students applications of 32 bit Processors.

### **OBJECTIVE :**

This program exposes the emerging Technologies in the area which is expanding by leaps and bounds. It is imperative that our students get glimpse of the emerging development via hands on experience.

### **LIST OF EXPERIMENTS**

- 1) Basic programs using ARM Processors
  - a) I/O PORTS
  - b) ADC
  - c) timers
  - d) capture control and Pulse width modulation
  - e) Serial communication
  - d) ZIGBEE interfacing
  - e) RF Communication
- 2) Use of Captures Control in the following applications
  - a) Transit time of a moving object
  - b) Velocity of acceleration measurement of a linear object/and above rotary object
  - c) Pulse width Modulation in power Control and regulator
  - d) PWM to generate any wave from, control phase and magnitude.
  - e) Measurement of frequency
  - f) Ultrasonic transit time measurement
- 3) Graphics
  - a. Pixel programming and display control graphic Display
  - b. Touch Sensitive search to select a Programming module
  - c. Graphic representation of Wave forms generation in (1) above



- 4) **Synchronous Communication** using
  - a. 12 c bus
  - b. SPI bus
  - c. Enumeration in USB
  - d. Two wire Flash Program using of EEPROMS, Flash memories' and Programming
- 5) **In circuit-emulator** – Its examples application to
  - a) Debug a Program
  - b) Logic analysis of timing diagrams
- 6)
  - a) ADC Measurement
  - b) Data Acquisition and analysis
  - c) Measurement of timing wave forms for peak and valleys
  - d) Bluetooth Wireless Transmission



## DATA MINING AND DATA WAREHOUSING LAB

**Course Code: ACS1110**

L	T	P	C
0	0	3	2

### AIM:

To apply the learnt concepts of data mining and text mining practically

### OBJECTIVES :

- To introduce Weka software
- To make students implement data mining algorithms in Java
- To introduce text mining techniques to students
- To build data cube either by using open source tools or using SQL.
- To design, develop and implement data warehouse for simple applications.
- To understand and study data warehouse administration support concepts by considering any one commercial data warehouse.

### LIST OF EXPERIMENTS

1. Introduction to Weka : All the features of Weka software will be explored in this assignment. (2 weeks)
2. Implementation of Apriori algorithm (2 weeks)
3. Implementation of FP tree algorithm (2 weeks)
4. Implementation of Naïve Bayesian classification algorithm (1 week)
5. Implementation of K-means clustering algorithm (1 week)
6. Introduction to text mining : Text mining preprocessing tasks such as stop word removal, POS tagging, Introduction to Wordnet, Indexing, Classification of text using Naïve bayes etc. (3 weeks)

7. OLAP operators, building of data cube, simulation of data cube using powerful functions of SQL (1 week).
8. Data warehouse design and development-case study (1 week).
9. Data warehouse administration support-partitioning in SQL, parallel execution, materialized views, and demonstration using a data base (1 week).





---

---

***COURSE STRUCTURE &  
SYLLABI FOR VIII SEMESTER***

---

---



## HUMAN COMPUTER INTERACTION

**Course Code: ACS1111**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>

### **AIM:**

**HCI** is the study of interaction between humans and computers specifically as it pertains to information security. Its aim, in plain terms, is to improve the usability of security features in end user applications.

### **OBJECTIVE:**

The student will learn how interaction with computers takes place at user interface, which comprises both hardware and software.

### **UNIT-I**

Introduction: Importance of user Interface – definition, importance of good design. Benefits of good design. A brief history of Screen design.

### **UNIT-II**

The graphical user interface – popularity of graphics, the concept of direct manipulation, graphical system, characteristics, web user – interface popularity, characteristics- principle of user interface.

### **UNIT-III**

Design process – Human interaction with computers, importance of human characteristics and human consideration; Human interaction speeds and understanding business functions.

### **UNIT-IV**

Screen Designing:- Design goals – Screen planning and purpose, organizing screen elements, ordering of screen data and content – screen navigation and flow – Visually pleasing composition – amount of information – focus and emphasis – presentation information simply and meaningfully – information retrieval on web – statistical graphics – Technological consideration in interface design.

**UNIT-V**

Windows – New and Navigation schemes selection of window, selection of devices based and screen based Controls.

**UNIT-VI**

Components – text and messages, Icons and increases – multimedia, colors, uses problems, choosing colors.

**UNIT-VII**

Software tools – Specification methods, interface – Building Tools.

**UNIT-VIII**

Interaction Devices – Keyboard and function keys – pointing devices – speech recognition digitization and generation – image and video displays – drivers.

**TEXT BOOKS:**

1. Ben Shneidermann, “Designing the User Interface”, 3<sup>rd</sup> Edition, Pearson Education Asia, 2007.

**REFERENCE BOOKS:**

1. Alan Dix, Janet Finclay, “Human – Computer Interaction,” 3<sup>rd</sup> Edition, Pearson, 2003.
2. Rogers, Sharps, “Interaction Design, PRECE”, 1<sup>st</sup> Edition, Wiley Dreamtech, 2002.
3. Soren Lauesen, “User Interface Design”, 1<sup>st</sup> Edition, Pearson Education, 2005.
- 4.. Wilbert O Galitz, “The Essential Guide to User Interface Design”, 3<sup>rd</sup> Edition, Wiley DreamTech, 2007.





# NETWORK MANAGEMENT SYSTEMS

(ELECTIVE-III)

(Common to CSE & IT)

**Course Code: ACT1127**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>1</b>	<b>0</b>	<b>4</b>

Pre-requisite: Computer Networks

## AIM :

To help student understand network management systems and applications in real world.

## OBJECTIVE :

- To provide an understanding of SNMP and OSI network management standards and technologies.
- To familiarize the student with network management tools and systems used in industry.
- To analyze the challenges faced by Network managers.

## UNIT-I

### DATA COMMUNICATION AND NETWORK MANAGEMENT

**OVERVIEW :** Analogy of Telephone Network Management, Communications protocols and Standards, Case Histories of Networking and Management, Challenges of Information Technology Managers, Network Management: Goals, Organization, and Functions, Network and System Management, Network Management System Platform, Current Status and future of Network Management.

## UNIT-II

**SNMPV1 NETWORK MANAGEMENT :** Organization and Information Models.

**MANAGED NETWORK:** Case Histories and Examples, The History of SNMP Management, The SNMP Model, The Organization Model, System Overview, The Information Model.

### UNIT-III

**SNMPV1 NETWORK MANAGEMENT :** Communication and Functional Models. The SNMP Communication Model, Functional model.

### UNIT-IV

**SNMP MANAGEMENT: SNMPv2 :** Major Changes in SNMPv2, SNMPv2 System Architecture, SNMPv2 Structure of Management Information, The SNMPv2 Management Information Base, SNMPv2 Protocol, Compatibility With SNMPv1.

### UNIT-V

**SNMP MANAGEMENT: RMON:** What is Remote Monitoring? , RMON SMI and MIB, RMON1, RMON2, ATM Remote Monitoring, a Case Study of Internet Traffic Using RMON

### UNIT-VI

**TELECOMMUNICATIONS MANAGEMENT NETWORK:** Why TMN? , Operations Systems, TMN Conceptual Model, TMN Standards, TMN Architecture, TMN Management Service Architecture, An Integrated View of TMN, implementation Issues.

### UNIT-VII

**NETWORK MANAGEMENT TOOLS AND SYSTEMS:** Network Management Tools, Network Statistics Measurement Systems, History of Enterprise Management, Network Management systems, Commercial Network management Systems, System Management, Enterprise Management Solutions.

### UNIT-VIII

**WEB-BASED MANAGEMENT :** NMS with Web Interface and Web-Based Management, Web Interface to SNMP Management, Embedded Web-Based Management, Desktop management Interface, Web-Based Enterprise Management, WBEM: Windows Management Instrumentation, Java management Extensions, Management of a Storage Area Network: , Future Directions.

**TEXT BOOK:**

1. Mani Subrahmanian, “Network Management Principles and Practice”, 2<sup>nd</sup> Edition, Pearson Education, 2010.

**REFERENCE BOOKS:**

1. Morris, “Network management”, 1<sup>st</sup> Edition, Pearson Education, 2008.
2. Mark Burges, “Principles of Network System Administration”, 1<sup>st</sup> Edition, Wiley DreamTech, 2008.



# ARTIFICIAL NEURAL NETWORKS

(ELECTIVE-III)

**Course Code: ACS1112**

L	T	P	C
4	1	0	4

## AIM:

To give prerequisites in understanding the concepts of Neural Networks and applications.

## OBJECTIVE :

To introduce Neural Network models, synaptic dynamics, ANN for pattern recognition and applications.

## UNIT-1

**BASICS OF ARTIFICIAL NEURAL NETWORKS :** Characteristics of neural networks, Historical development of neural network, artificial neural networks: terminology, models of neurons, topology, basic learning laws.

## UNIT-II

**ACTIVATION AND SYNAPTIC DYNAMICS :** Activation Dynamics models, Synaptic Dynamics models, learning methods, stability and convergence, recall in neural networks.

## UNIT-III

**FUNCTIONAL UNITS OF ANN FOR PATTERN RECOGNITION TASKS :** Pattern Recognition Problems, basic functional units, Pattern Recognition tasks by the functional units.

## UNIT-IV

**FEED FORWARD NEURAL NETWORKS :** Analysis of pattern association networks, Analysis of pattern classification networks, Analysis of pattern mapping networks.

## UNIT-V

**FEEDBACK NEURAL NETWORKS :** Analysis of linear auto

associative FF Networks, Analysis of pattern storage networks, Stochastic Networks and Simulated Annealing, Boltzmann Machine.

## **UNIT-VI**

### **COMPETITIVE LEARNING NEURAL NETWORKS :**

Components of competitive learning networks, analysis of feedback layer for different output functions, analysis of pattern clustering networks, analysis of feature mapping networks.

## **UNIT-VII**

### **ARCHITECTURES FOR COMPLEX PATTERN RECOGNITION TASKS :**

Associative memory, pattern mapping, stability-plasticity dilemma: ART, Temporal patterns, Pattern Variability: Neocognitron.

## **UNIT-VIII**

**APPLICATIONS OF ANN :** Direct Applications, Application Area.

### **TEXT BOOK:**

1. B. Yegnanarayana, “Artificial Neural Networks”, 1<sup>st</sup> Edition, Prentice Hall, 2009

### **REFERENCE BOOKS:**

1. Satish Kumar, “Neural Networks – A Classroom Approach”, 2<sup>nd</sup> Edition, Tata McGraw-Hill, 2004.
1. C.M.Bishop, “Pattern Recognition and Machine Learning”, 1<sup>st</sup> Edition, Springer, 2006.



## IMAGE PROCESSING

(ELECTIVE-III)

(Common to CSE & IT)

**Course Code: ACT1128**

L	T	P	C
4	1	0	4

Pre-requisite: Computer Graphics

### AIM:

To introduce the student to various image processing techniques.

### OBJECTIVES:

- To study the image fundamentals and mathematical transforms necessary for image processing.
- To study the image enhancement techniques
- To study image restoration procedures.
- To study the image compression procedures.
- To study the image segmentation and representation techniques.

### UNIT-I

**INTRODUCTION:** Examples of fields that use digital image processing, fundamental steps in digital image processing, components of image processing system. Digital Image Fundamentals: A simple image formation model, image sampling and quantization, basic relationships between pixels.

### UNIT-II

**IMAGE ENHANCEMENT IN THE SPATIAL DOMAIN :** Basic gray-level transformation, histogram processing, enhancement using arithmetic and logic operators, basic spatial filtering, smoothing and sharpening spatial filters, combining the spatial enhancement methods ( p.nos 76-141 of text book).

### UNIT-III

**IMAGE RESTORATION :** A model of the image degradation/restoration process, noise models, restoration in the presence of noise—only spatial filtering, Weiner filtering, constrained least squares filtering, geometric transforms; Introduction to the Fourier transform and the frequency domain, estimating the degradation function.

### UNIT-IV

**COLOR IMAGE PROCESSING :** Color fundamentals, color models, pseudo color image processing, basics of full—color image processing, color transforms, smoothing and sharpening, color segmentation.

### UNIT-V

**IMAGE COMPRESSION :** Fundamentals, Image compression models, error-free compression, lossy predictive coding, image compression standards: JPEG compression standard, Fractal compression scheme, Wavelet compression scheme.

### UNIT-VI

**MORPHOLOGICAL IMAGE PROCESSING :** Preliminaries, dilation, erosion, open and closing, hit or miss transformation, basic morphological algorithms.

### UNIT-VII

**IMAGE SEGMENTATION :** Detection of discontinuous-First order and second order edge operators, Edge linking and boundary detection, Canny's edge detection algorithm, Hough transform for detecting lines and curves, Edge linking, thresholding, region—based segmentation.

### UNIT-VIII

**OBJECT RECOGNITION :** Patterns and patterns classes, recognition based on decision—theoretic methods, matching, optimum statistical classifiers, neural networks, structural methods – matching shape numbers, string matching.

### TEXT BOOK:

1. Rafeal C.Gonzalez, Richard E.Woods, “Digital Image Processing”, 3rd Edition, Pearson Education/PHI,2010.

**REFERENCE BOOKS:**

1. Milan Sonka, Vaclav Hlavac and Roger Boyle, “Image Processing, Analysis, and Machine Vision”, 2<sup>nd</sup> Edition, ThomsonLearning, 2010.
2. Alasdair McAndrew, “Introduction to Digital Image Processing with Matlab”, 1<sup>st</sup> Edition, Thomson CourseTechnology, 2010.
3. Adrian Low, “Computer Vision and Image Processing”, 2<sup>nd</sup> Edition, B. S. Publications, 2010.
4. Rafeal C.Gonzalez, Richard E.Woods, Steven L. Eddins, “Digital Image Processing using Matlab”, 1<sup>st</sup> Edition Pearson Education, 2010.
5. William K. Prat, Wily, “Digital Image Processing”, 3<sup>rd</sup> Edition
6. B. Chanda, D. Datta Majumder, “Digital Image Processing and Analysis”, 2<sup>nd</sup> Edition Prentice Hall of India, 2011.





# MULTI-CORE PROGRAMMING

(ELECTIVE-III)

(Common to CSE & IT)

**Course Code: ACT1137**

L	T	P	C
4	1	0	4

Pre-requisite: LINUX

## AIM :

To make students capable of using multicore processors efficiently with the help multicore programming tools.

## OBJECTIVE:

To introduce the basic concepts of multicore programming and various practical models of mutlicore programming.

## UNIT-I

### INTRODUCTION TO MULTI-CORE ARCHITECTURE:

Motivation for Concurrency in Software, Parallel Computing Platforms( SIMD & MIMD systems, an overview of Single-Core, Multi-Processor, Multi-Core Architectures) , Parallel Computing in Microprocessors, Differentiating Multi-Core Architectures from Hyper-Threading Technology, Multi-threading on Single-Core versus Multi-Core Platforms, Understanding Performance, Amdahl's Law, Gustafson's Law

## UNIT-II

### MULTI-CORE PROCESSORS: AN OVERVIEW OF SOFTWARE THREADING DEFINING THREADS, SYSTEM VIEW OF

**THREADS:** Threading above the Operating System, Threads inside the OS , Threads inside the Hardware , Application Programming Models and Threading , Virtual Environment: Virtual Machines and Platforms, Runtime Virtualization, System Virtualization.

## UNIT-III

### PARALLEL PROGRAMMING FUNDAMENTAL CONCEPTS :

Designing for threads, parallel programming patterns, Threading and

parallel programming constructs : Synchronization, Critical sections , Deadlock, Synchronization Primitives, Messages

## UNIT-IV

### THREADING API's

Threading APIs for Microsoft Windows, Threading APIs for Microsoft .NET Framework: Creating Threads, Managing Threads, Thread Pools, Thread Synchronization, POSIX Threads: Creating Threads, Managing Threads, Thread Synchronization , Signaling , Compilation and Linking .

## UNIT-V

### OPENMP PROGRAMMING

OpenMP : Challenges in Threading a loop , Minimizing Threading overhead, Performance oriented Programming , Library Functions.

Solutions to parallel programming problems : Data races, deadlocks and Livelocks Non-blocking algorithms, Memory and cache related issues.

## UNIT-VI

**MPI PROGRAMMING** Message-Passing Model, Message-Passing Interface, MPI functions, Compiling and running MPI Programs, collective communication, data decomposition, Point-to-point communication – MPI Library.

## UNIT-VII

**MULTI-THREADED DEBUGGING TECHNIQUES** General Debug Techniques, Debugging Multi-threaded Applications in Windows : Threads Window , Tracepoints, Breakpoint Filters, Naming Threads , Multi-threaded Debugging Using GDB.

## UNIT-VIII

**MULTI-CORE PROCESSORS SOFTWARE DEVELOPMENT PRODUCTS:** An Overview of Software tools on Multi-Core Processors, Intel Software Development Products: overview , Thread Checker, Compilers: OpenMP, Software-based Speculative Precomputation, Compiler Optimization and Cache Optimization, Debugger , Intel Libraries, Intel Threading Building Blocks , VTune Performance Analyzer , Thread Profiler , MPI Programming : Intel Support for MPI

**TEXT BOOKS:**

1. Shameem Akhter and Jason Roberts, “Multi-Core Programming- Increasing Performance through Software Multi-Threading”, 1<sup>st</sup> Edition, Intel Press, 2006.
2. Michael J Quinn, “Parallel programming in C with MPI and OpenMP”, 2<sup>nd</sup> Edition, Tata McGraw Hill, 2007.

**REFERENCE BOOKS:**

1. John L. Hennessey and David A. Patterson, “Computer architecture – A quantitative approach”, 4<sup>th</sup> Edition, Morgan Kaufmann/Elsevier Publishers, 2007.
2. David E. Culler, Jaswinder Pal Singh, “Parallel computing architecture : A hardware /software approach”, 1<sup>st</sup> Edition, Morgan Kaufmann/Elsevier Publishers, 1999.
3. Grama Ananth, Anshul Gupta, George Karypis and Vipin Kumar, “Introduction to Parallel Computing”, 2<sup>nd</sup> Edition, Addison-wesley, 2003.



## GREEN BUILDINGS AND INFRASTRUCTURE

(ELECTIVE III)

(Common to all branches except Civil Engineering )

Pre-requisites: None

**Course Code: ACE 1153**

L	T	P	C
4	1	0	4

### AIM :

To impart knowledge regarding environmental sustainability and environmentally responsible green buildings.

### OBJECTIVE :

The student must be able to develop skills to promote eco friendly characteristics in the area of buildings and identify crucial technologies, facilities and applications that help in developing green buildings.

### UNIT-I

**INTRODUCTION :** Introduction to Green Buildings.

### UNIT-II

**MACRO ENVIRONMENT:** Elements of climate, weather, Water cycle, Carbon cycle, Environmental quality, Deforestation, climatic change, Ozone depletion and implications.

### UNIT-III

**MICRO-ENVIRONMENT :** Natural environment Vis a vis built environment. Living environment characteristics and components of Urban Ecosystem solar radiation, heat flow, air-movement, land use, drainage and sanitation.

### UNIT-IV

**CONCEPTS OF GREEN FIELD DEVELOPMENT :** Brown field development, environmental impact and ecological balance, FAR, layouts, sustainable Site development, vegetation, landscape elements, alternative

services and technologies, rain water harvesting, on site sewerage retention, treatment, recycle and reuse.

### **UNIT-V**

**BUILDING RESOURCES :** Passive energy system Design, Building envelope, orientation and components of building fabric and Shading, High rise buildings, modular building Construction, curtain walls, Sourcing and recycling of building materials, alternative Calcareous, metallic and non metallic, materials.

### **UNIT-VI**

**BUILDING INFRASTRUCTURE :** Active Energy Systems in buildings, Utilities and services, building automation. electro-mechanical systems, lifts and transportation, captive power plant and equipment, operation & maintenance.

### **UNIT-VII**

**INDOOR AIR QUALITY :** Fresh air requirements standards, Sick Building Syndrome and pollutants.

### **UNIT-VIII**

**BUILDING RATING SYSTEMS :** Building auditing, points system, components, and weight age, agencies and institutions, GBC, TERI etc, green buildings in the contexts of Indian sub continent.

### **TEXT BOOKS :**

1. Koenigsberger, O.H. “Manual of Tropical Housing and Building”, Orient Longman Publishers, Chennai, 2003.
2. Odum, P. Eugene. “Ecology and Environments”, 2nd ed. Oxford and IBH Publishers, New Delhi, 2005.

### **REFERENCE BOOKS:**

1. Greening Building – Green Congress, US.(web).
2. HSMI. Sustainable Building Technology – HUDCO, HSMI Human Settlement Management Institution, New Delhi.



## PATTERN RECOGNITION

(ELECTIVE-IV)

(Common to CSE & IT)

**Course Code: ACT1129**

L	T	P	C
4	1	0	4

Pre-requisite: None

### AIM:

To provide the basic skill in methods of design and analysis to identify patterns across engineering areas. Student will know about different aspects of machine learning using concepts of pattern recognition.

### OBJECTIVE:

To understand the methods and processes that shall be adopted to identify hidden patterns in the large volumes of data. This course covers the theory and methods for learning from data with an emphasis on pattern classification.

### UNIT-I

**INTRODUCTION :** Machine perception, pattern recognition example, pattern recognition systems, the design cycle, learning and adaptation.

### UNIT-II

**BAYESIAN DECISION THEORY :** Introduction, continuous features – two categories classifications, minimum error-rate classification- zero-one loss function, classifiers, discriminant functions, and decision surfaces.

### UNIT-III

**NORMAL DENSITY :** Univariate and multivariate density, discriminant functions for the normal density different cases, Bayes decision theory – discrete features, compound Bayesian decision theory and context.

### UNIT-IV

**MAXIMUM LIKELIHOOD AND BAYESIAN PARAMETER ESTIMATION :** Introduction, maximum likelihood estimation, Bayesian estimation, Bayesian parameter estimation–Gaussian case.

## UNIT-V

**UN-SUPERVISED LEARNING AND CLUSTERING :** Introduction, mixture densities and identifiability, maximum likelihood estimates, application to normal mixtures, K-means clustering. Data description and clustering – similarity measures, criteria function for clustering.

## UNIT-VI

**COMPONENT ANALYSES :** Principal component analysis, non-linear component analysis; Low dimensional representations and multi dimensional scaling.

## UNIT-VII

**DISCRETE HIDDEN MARKOV MODELS :** Introduction, Discrete–time markov process, extensions to hidden Markov models, three basic problems for HMMs.

## UNIT-VIII

**CONTINUOUS HIDDEN MARKOV MODELS :** Observation densities, training and testing with continuous HMMs, types of HMMs.

## TEXT BOOKS:

1. Richard O. Duda, Peter E. Hart, David G. Strok, “ Pattern classifications”, 2<sup>nd</sup> Edition Wiley Student Edition, 2010.
2. Lawrence Rabiner, Biing, “Fundamentals of speech Recognition”, 1<sup>st</sup> Edition, Hwang Juang Pearson Education, 2009.

## REFERENCE BOOK:

1. Earl Gose, Richard John baugh, “Pattern Recognition and Image Analysis”, 1<sup>st</sup> Edition, PHI, 2004.



## MOBILE COMMUNICATIONS

(ELECTIVE-IV)

(Common to CSE & IT)

**Course Code: ACT1132**

L	T	P	C
4	1	0	4

### AIM:

To teach the students about the fundamentals of mobile communications.

### OBJECTIVE:

The student shall be able to learn about wireless MAC, mobile IP, mobile TCP, database issues in mobile networks, MANETs.

### UNIT-I

#### INTRODUCTION TO MOBILE COMMUNICATIONS AND

**COMPUTING:** Mobile Computing (MC): Introduction to MC, novel applications, limitations, and architecture.

**GSM:** Mobile services, System architecture, Radio interface, Protocols, Localization and calling, Handover, Security, and New data services.

### UNIT-II

**(WIRELESS) MEDIUM ACCESS CONTROL :** Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA.

### UNIT-III

**MOBILE NETWORK LAYER:** Mobile IP (Goals, assumptions, entities and terminology, IP packet delivery, agent advertisement and discovery, registration, tunneling and encapsulation, optimizations), Dynamic Host Configuration Protocol (DHCP).

### UNIT-IV

**MOBILE TRANSPORT LAYER :** Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/fast recovery, Transmission /time-out freezing, Selective retransmission, Transaction oriented TCP.



## UNIT-V

**DATABASE ISSUES :** Hoarding techniques, caching invalidation mechanisms, client server computing with adaptation, power-aware and context-aware computing, transactional models, query processing, recovery, and quality of service issues.

## UNIT-VI

**DATA DISSEMINATION:** Communications asymmetry, classification of new data delivery mechanisms, push-based mechanisms, pull-based mechanisms, hybrid mechanisms, selective tuning (indexing) techniques.

## UNIT-VII

**MOBILE AD HOC NETWORKS (MANETs):** Overview, Properties of a MANET, spectrum of MANET applications, routing and various routing algorithms, security in MANETs.

## UNIT-VIII

**PROTOCOLS AND TOOLS :** Wireless Application Protocol-WAP. (Introduction, protocol architecture, and treatment of protocols of all layers), Bluetooth (User scenarios, physical layer, MAC layer, networking, security, link management) and J2ME.

## TEXT BOOKS:

1. Jochen Schiller, “Mobile Communications”, 2<sup>nd</sup> Edition, Addison-Wesley, 2004 (Chapters 4, 7, 9, 10, 11).
2. Ivan Stojmenovic and Cacute, “Handbook of Wireless Networks and Mobile Computing”, 1<sup>st</sup> Edition, Wiley Publications, 2002, (Chapters 11, 15, 17, 26 and 27).

## REFERENCE BOOKS:

1. Reza Behravanfar, “Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML”, 1<sup>st</sup> Edition, Cambridge University Press, 2008.
2. Adelstein, Frank, Gupta, Sandeep KS, Richard III, Golden, Schwiebert, Loren, “Fundamentals of Mobile and Pervasive Computing”, 1<sup>st</sup> Edition, McGraw-Hill Professional, 2008.

3. Hansmann, Merk, Nicklous, Stober, “Principles of Mobile Computing”, 2<sup>nd</sup> Edition, Springer, 2003.
4. Martyn Mallick, “Mobile and Wireless Design Essentials”, 1<sup>st</sup> Edition, Wiley DreamTech, 2008.



## VIRTUAL REALITY

(ELECTIVE-IV)

**Course Code: ACS 1113**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>1</b>	<b>0</b>	<b>4</b>

### AIM:

Virtual Reality has branched out into numerous domains - from education to medicine to the alluring world of entertainment. The aim of this course is to train students in higher domain of virtual reality.

### OBJECTIVES:

1. To introduce the student to virtual reality in audio visual appliances, training, aircraft piloting, simulation of human movement and control etc.
2. To provide an understanding of visual affects, position sensing and three dimensional affects.

### UNIT-I

**INTRODUCTION :** The three I's of virtual reality, commercial VR technology and the five classic components of a VR system. (1.1, 1.3 and 1.5 of Text book 1)

### UNIT-II

**INPUT DEVICES :** (Trackers, Navigation, and Gesture Interfaces): Three-dimensional position trackers, navigation and manipulation, interfaces and gesture interfaces. (2.1, 2.2 and 2.3 of Text book 1).

### UNIT-III

**OUTPUT DEVICES :** Graphics displays, sound displays & haptic feedback. (3.1,3.2 & 3.3 of Text book 1)

### UNIT-IV

**MODELING :** Geometric modeling, kinematics modeling, physical modeling, behavior modeling, model management. (5.1, 5.2 and 5.3, 5.4 and 5.5 of Text book 1).

## UNIT-V

Human Factors: Methodology and terminology, user performance studies, VR health and safety issues. (7.1, 7.2 and 7.3 of Text book 1).

## UNIT-VI

**APPLICATIONS:** Medical applications, military applications, robotics applications. (8.1, 8.3 and 9.2 of Text book 1).

## UNIT-VII

**VR PROGRAMMING-I :** Introducing Java 3D, loading and manipulating external models, using a lathe to make shapes. (Chapters 14, 16 and 17 of Text book 2)

## UNIT-VIII

**VR PROGRAMMING-II :** 3D Sprites, animated 3D sprites, particle systems. (Chapters 18, 19 and 21 of Text book 2)

## TEXT BOOKS:

1. Gregory C. Burdea & Philippe Coiffet, “Virtual Reality Technology”, 2<sup>nd</sup> Edition, John Wiley & Sons, Inc., 2003.
2. Andrew Davison, “Killer Game Programming in Java”, 1<sup>st</sup> Edition, O’Reilly-SPD, 2005.

## REFERENCES BOOKS:

1. William R.Sherman, Alan Craig, “Understanding Virtual Reality, Interface, Application and Design,” 2<sup>nd</sup> Edition, Elsevier (Morgan Kaufmann), 2003.
2. Bill Fleming, “3D Modeling and surfacing”, 1<sup>st</sup> Edition, Elsevier (Morgan Kauffman), 2003.
3. David H.Eberly, “3D Game Engine Design”, 2<sup>nd</sup> Edition, Elsevier, 2006.
4. John Vince, “Virtual Reality Systems”, 1<sup>st</sup> Edition, Pearson Education, 2004.



# INFORMATION STORAGE SECURITY AND MANAGEMENT

(ELECTIVE-IV)  
(Common to CSE & IT)

**Course Code: ACT1138**

L	T	P	C
4	1	0	4

Pre-requisite: Information storage systems

## AIM:

Describes the advanced concepts involved in information storage and Management.

## OBJECTIVES:

- Describe about Information availability and Business continuity
- Describe the backup/recovery topologies
- Describe local replication and remote replication technologies and their operation
- Describe processes and technologies for identifying, analyzing, and mitigating security risks in storage infrastructure

## UNIT-I

**CONTENT-ADDRESSED STORAGE :** Fixed Content and Archives, Types of Archives, Features and Benefits of CAS,CAS Architecture, Object Storage and Retrieval in CAS,CAS Examples: Health Care Solution-Storing Patient Studies, Finance Solution-Storing Financial records.

**CONCEPTS IN PRACTICE:** EMC Centera, EMC Centera Models, EMC Centera Architecture ,Centera Tools, EMC Centera Universal Access

## UNIT-II

**STORAGE VIRTUALIZATION :** Forms of Virtualization: Memory Virtualization, Network Virtualization: Server Virtualization: Storage Virtualization, SNIA Storage Virtualization Taxonomy, Storage Virtualization Configurations, Storage Virtualization Challenges: Scalability, Functionality,

Manageability, Support. Types of Storage Virtualization: Block-Level Storage Virtualization, File-Level Virtualization. Concepts in Practice: EMC Invista, Rainfinity.

### UNIT-III

**INTRODUCTION TO BUSINESS CONTINUITY :** Information Availability: Causes of Information Unavailability, Measuring Information Availability, Consequences of Downtime. BC Terminology, BC Planning Lifecycle, Failure Analysis: Single Point of Failure. Fault Tolerance: Multipathing Software, Business Impact Analysis, BC Technology Solutions, Concept in Practice: EMC PowerPath, PowerPath Features, Dynamic Load Balancing, Automatic Path Failover.

### UNIT-IV

**BACKUP AND RECOVERY :** Backup Purpose: Disaster Recovery, Operational Backup: Archival. Backup Considerations, Backup Granularity, Recovery Considerations, Backup Methods, Backup Process, Backup and Restore Operations, Backup Topologies: Serverless Backup, Backup in NAS Environments, Backup Technologies : Backup to Tape, Physical Tape Library, Backup to Disk, Virtual Tape Library. Concepts in Practice: EMC NetWorker: NetWorker Backup Operation, NetWorker Recovery, EmailXtender, DiskXtender, Avamar, EMC Disk Library (EDL), Summary.

### UNIT-V

**LOCAL REPLICATION :** Source and Target, Uses of Local Replicas, Data Consistency: Consistency of a Replicated File System, Consistency of a Replicated Database. Local Replication Technologies: Host-Based Local Replication, Storage Array-Based Replication. Restore and Restart Considerations: Tracking Changes to Source and Target, Creating Multiple Replicas, Management Interface, Concepts in Practice: EMC TimeFinder and EMC SnapView, TimeFinder/Clone, TimeFinder/Mirror, EMC SnapView, EMC SnapSure, Summary

### UNIT-VI

**REMOTE REPLICATION :** Modes of Remote Replication, Remote Replication Technologies: Host-Based Remote Replication, Storage Array-Based Remote Replication, SAN-Based Remote Replication. Network Infrastructure: DWDM, SONET. Concepts in Practice: EMC SRDF,

EMC SAN Copy and EMC MirrorView : SRDF Family, Disaster Recovery with SRDF: SRDF Operations for Concurrent Access ,EMC SAN Copy, EMC MirrorView, Summary.

## UNIT-VII

**SECURING THE STORAGE** Storage Security, Risk : Assets, Threats ,Vulnerability. Storage Security Domains, Securing the Application Access Domain: Securing the Management Access Domain, Securing Backup, Recovery, and Archive (BURA) . Security Implementations in Storage Networking: SAN, NAS, IP SAN, Summary.

## UNIT-VIII

**MANAGING THE STORAGE INFRASTRUCTURE :** Monitoring the Storage Infrastructure: Parameters Monitored, Components Monitored, Monitoring Examples, Alerts. Storage Management Activities: Availability management, Capacity management, Performance management, Security Management, Reporting, Storage Management Examples. Storage Infrastructure Management Challenges, Developing an Ideal Solution: Storage Management Initiative, Enterprise Management Platforms. Concepts in Practice: EMC Control Center: Control Center Features and Functionality, Control Center Architecture, Summary.

## TEXT BOOKS:

1. G.Somasundaram, A.Shrivastava:EMC Corporation, “Information Storage and Management”, 1<sup>st</sup> Edition, Wiley publication, 2009.
2. Robert Spalding, “Storage Networks : The Complete Reference”, 1<sup>st</sup> Edition, Tata McGraw Hill/Osborne, 2003.

## REFERENCE BOOKS:

1. Marc Farley, “Building Storage Networks,” 2<sup>nd</sup> Edition, Tata McGraw Hill/Osborne, 2001.
2. Meeta Gupta, “Storage Area Network Fundamentals”, 1<sup>st</sup> Edition, Pearson Education, 2002.



## OPTIMIZATION TECHNIQUES

(ELECTIVE – IV)

(Common to all branches)

**Pre-requisites:** Basic mathematical theory of vectors, matrices and functions.

**Course Code:** ACH1148

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>1</b>	<b>0</b>	<b>4</b>

### AIM & OBJECTIVES:

This course is concerned with formulating the optimization problems and solving them. Advanced topics on Evolutionary Optimization are also treated. MATLAB optimization Toolbox is used to solve large scale optimization problems.

### UNIT-I

#### INTRODUCTION TO PROCESS OPTIMIZATION:

Formulation of various process optimization problems and their classification, constrained and unconstrained optimization. Classification of points in the 2D space.

Basic concepts of optimization: Convex Set, Convex functions, necessary and sufficient conditions for stationary points. Calculating Gradient of a function and Hessian matrix. Identifying minima and maxima points.

### UNIT-II

**LINEAR PROGRAMMING:** SIMPLEX algorithm, duality in Linear programming.

### UNIT-III

**TRANSPORTATION PROBLEM :** Solution of Balanced problems using East-West Rule.

### UNIT-IV

**UNCONSTRAINED OPTIMIZATION:** Optimality Criteria, Unidirectional search, Powell's Conjugate direction method, Gradient



based method: Cauchy's steepest Descent method; Newton's method.

#### **UNIT-V**

**CONSTRAINED OPTIMIZATION** : Kuhn-Tucker conditions, Transformation methods: Penalty function method, method of multipliers.

#### **UNIT-VI**

**DISCRETE OPTIMIZATION** : Enumeration techniques and Branch and Bound method to solve discrete optimization problem.

#### **UNIT-VII**

**GENETIC ALGORITHMS** : Working principles, differences between GAs and traditional methods. Various operations like crossover and mutation.

**SIMULATED ANNEALING** : Metropolis Algorithm. (Qualitative treatment of GA and SA only).

#### **UNIT-VIII**

**MULTIOBJECTIVE OPTIMIZATION (MOO)** : Different methods to solve MOO like Utility function method and bounded function method. Solving 2D MOO problems graphically and identifying the Pareto set.

#### **TEXT BOOK:**

1. Kalyanmoy D, "Optimization for Engineering Design", Prentice Hall of India, 2005.
2. Rao S.S, "Engineering Optimization-Theory & Practices", New Age International Publishers, New Delhi, 1996.

#### **REFERENCES:**

1. Reklaitis, G.V., Ravindran, A., and Ragdell, "Engineering Optimization-Methods and Application", K.M., John Wiley, New York, 1983.

